



Bilkent University

Department of Computer Engineering

CS413

SOFTWARE ENGINEERING PROJECT MANAGEMENT

TEAM PROJECT PROJECT MANAGEMENT PLAN (PMP)

ALIZE

PROJECT MANAGERS 4.0

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The contents of this PMP explain how the project is to fulfil the purpose and outcomes. This plan can be updated as needed and authorized. This document is intended to aid project managers in managing to successful conclusion those projects concerned with software systems.

This plan is based on ISO/IEC/IEEE 16326:2019.

This project management plan is prepared for **ALIZE**, by **PROJECT MANAGERS 4.0**.

2023

EXECUTIVE SUMMARY

In this document, a startup project is described that uses customized internet wholesale applications to link Turkish producers with foreign clients. By offering premium goods to customers overseas at low prices, the project aims to improve the export potential of Turkish producers. The platform is expected to launch within a year and the project team is made up of five individuals. A user-friendly platform with a product catalog, competitive pricing, and a safe payment method will be created by the team. To ensure the project's success, the team will do market research, build relationships with logistics firms, and regularly monitor and analyze the project's development. In conclusion, this project intends to improve Turkish manufacturers' export potential and streamline the communication process between them and foreign clients.

FRONT MATTER

Project Name: Alize

Date of Issue: 28 May 2023

Alize Project Management Plan version 3.0

Approval Record

Stakeholder Representative

Name: Nejat Savaş

Date: 26 May 2023

Signature: 

Legal Counsel

Name: İlker Tamer

Date: 26 May 2023

Signature: 

Change History:

| Version | Date | Changes | Reason |
|---------|--------------|--------------------------------------|---|
| 1.0 | 5 May, 2023 | First Version | First Version |
| 2.0 | 9 May, 2023 | Updated project scope and objectives | Project requirements were clarified during stakeholder meetings |
| 3.0 | 20 May, 2023 | Added new section on risk management | Identified the need to proactively address potential risks |

Table 1: Change History

This PMP explains the scope and context of the Alize project. It provides an overview of the project's purpose, objectives, and planning process. The target audience of this document is the stakeholders, managers and project team involved in the Alize project.

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PROJECT OVERVIEW

Project Summary

The multi vendor B2B online shopping platform connecting Turkish manufacturers to the global market.

Purpose, Scope and Objectives

The Alize project's goal is to raise export volumes by promoting Turkish manufacturers' competitiveness on the international market. Through the Alize platform, it is hoped that Turkish producers would interact with foreign customers and provide premium goods at affordable costs.

The project aims to make Turkish producers more competitive in the global market, offer high-quality, reasonably priced goods to overseas clients, and promote international trade. These targets aim to increase the export potential of Turkish manufacturers, encourage economic growth and offer various advantages to foreign customers.

The scope involves the building of a safe shopping platform as well as the creation of a tailored internet wholesale application that will link Turkish producers with overseas clients. Turkish manufacturers will be able to promote their goods on this platform, give customers access, and conduct safe transactions.

Within the parameters of the Alize project, the items to be presented or the tasks to be completed include developing a user-friendly platform, creating a product catalog, offering competitive pricing, and supplying secure payment options. With the help of these initiatives, clients should have a simple time shopping and be able to conduct secure transactions.

The effectiveness of the Alize initiative will be assessed using techniques for gauging consumer satisfaction. These strategies make use of tools like surveys of customer happiness, sales volume growth, and consumer feedback. In this approach, the success of the project's goals and the level of client satisfaction with the platform will be assessed.

Assumptions and Constraints

1. Assumptions:

- Project team members will be available all working days between the start and end dates of the project.
- Unexpected events will not occur or be minimized during the requirements, design and testing processes.

- All resources (human, hardware, software, etc.) will be provided on time and at reasonable cost.
- Communication and cooperation throughout the project will be carried out regularly and effectively among the project stakeholders.
- It is assumed that the platform has a user-friendly interface, providing an efficient way to showcase and purchase products.
- The success criteria of the project are predetermined among the project stakeholders and they have a common understanding.

2. Constraints:

- The project budget is an important constraint that affects the total cost.
- The scope of the project is limited to connecting only Turkish manufacturers of the platform with international buyers.
- The project duration is limited between the specified start and end dates.
- The platform allows users to promote their own products, but the production and shipment of products is beyond the scope of the project.
- It is not within the scope of the project to make legal agreements between buyers and sellers on the platform and to resolve any disputes that may arise.

Project Deliverables

Major outcomes and deliverables of the project are:

- Project plan and technical documents
 - Delivery Date: May 31, 2023
- Requirements Analysis Report
 - Delivery Date: July 31, 2023
- High-Level Design Report
 - Delivery Date: September 29, 2023
- Payment integration documents and reports
 - Delivery Date: September 29, 2023
- Low-Level Design Report
 - Delivery Date: October 25, 2023
- Messaging system documents and reports
 - Delivery Date: October 31, 2023
- Admin panel and analytical tools documents and reports

- Delivery Date: October 31, 2023
- Design Report
 - Delivery Date: October 31, 2023
- Creation of an admin panel and analytical tools
 - Delivery Date: November 30, 2023
- Creation of infrastructure for registration of foreign customers on the platform and purchase of products
 - Delivery Date: November 30, 2023
- Development of a messaging system that facilitates communication between sellers and buyers
 - Delivery Date: November 30, 2023
- Source code and executable files
 - Delivery Date: November 30, 2023
- Integration of secure and fast payment systems
 - Delivery Date: December 29, 2023
- Web and mobile applications of the platform
 - Delivery Date: December 29, 2023
- Acceptance Approval Report
 - Delivery Date: January 19, 2024
- Registration of Turkish manufacturers on the platform and showcasing their products
 - Delivery Date: January 19, 2024

Schedule and Budget Summary

The summary of schedule and budget is following. Each phase includes specific tasks and activities that need to be completed. The detailed work breakdown structure can be found in the Project Work Plans section of this report. The project is divided into several phases following the waterfall model.

- Project Initiation
- Requirements Engineering
- System Design
- Implementation
- Testing
- Deployment
- Maintenance and Support

Monthly Staff Payment Expenses:

- Front-end developer: 4 people/month at 13,000 TL/month = 52,000 TL
- Back-end developer: 4 people/month at 14,000 TL/month = 56,000 TL

- Mobile developer: 3 people/month at 14,000 TL/month = 42,000 TL
- QA engineer: 2 people/month at 15,000 TL/month = 30,000 TL
- Project manager: 3 people/month at 25,000 TL/month = 75,000 TL

Staff Payment Expenses by Project Phases:

- Project Initiation (QA Engineers, Project Managers): 105,000 TL
- Requirements Engineering (Back-end Engineers, QA Engineers, Project Managers): 161,000 TL
- System Design (Front-end Engineers, Mobile Engineers, QA Engineers, Project Managers): 199,000 TL
- Implementation (Front-end Engineers, Mobile Engineers, Back-end Engineers, Project Managers): 225,000 TL
- Testing (Front-end Engineers, Mobile Engineers, Back-end Engineers, QA Engineers, Project Managers): 255,000 TL
- Deployment (Front-end Engineers, Mobile Engineers, Back-end Engineers, Project Managers): 225,000 TL
- Maintenance and Support (Front-end Engineers, Mobile Engineers, Back-end Engineers, QA Engineers, Project Managers): 255,000 TL

Cumulative Other Expenses:

- Training: 20,000 TL
- Equipment: 17,875 TL
- Computer Hardware and Software: 8,257 TL
- Service Contracts: 80,000 TL
- Transportation: 6,396 TL
- Facilities: 7,530 TL
- Administrative and Janitorial Services: 2300 TL

Total Expenses:

- ❖ Staff Payment Expenses in Total: 1,461,000
- ❖ Other Expenses in Total: 142,358

Profit Margin:

- The profit margin is calculated based on the total budget. In this case, 10% of the total budget (Staff Payment Expenses + Other Expenses) = 160,336 TL.

Total Budget:

- Sum up the Staff Payment Expenses, Other Expenses, and Profit Margin to calculate the total budget:

Staff Payment Expenses (1,461,000 TL) + Other Expenses (142,358 TL) + Profit Margin (160,336 TL) = 1,763,694 TL

Evolution of the Plan

Scheduled updates to the PMP will be conducted at predefined intervals or milestones in the project. These updates will include a review of the current status, assessment of progress, and adjustments to the project plan as necessary. The frequency and timing of these updates will be determined based on project needs and the agreement of the project team and stakeholders.

Unscheduled updates may be required due to unforeseen circumstances, changes in project requirements, or emerging risks and opportunities. These updates will be initiated as needed to ensure that the PMP remains current and aligned with the evolving project environment. The project manager and relevant stakeholders will assess the need for unscheduled updates and coordinate their execution.

The updates to the PMP will be disseminated to the project team, stakeholders, and other relevant parties. The preferred methods of dissemination may include email communication, project meetings, project management software, or any other appropriate means of communication. The communication plan will outline the specific channels and frequencies for sharing the updated information.

The initial version of the PMP will be placed under configuration management to establish a controlled baseline. This will ensure that the document is protected from unauthorized changes and enable proper version control. The configuration management process will include identification, documentation, and control of changes made to the PMP.

To control subsequent changes to the PMP, a change control process will be established. Any proposed changes to the PMP, whether scheduled or unscheduled, will undergo a formal review and approval process. This process will involve assessing the impact of the proposed changes on the project objectives, scope, schedule, budget, and other relevant factors. Only approved changes will be incorporated into the updated versions of the PMP.

DEFINITIONS

- PMP: It means Project Management Plan and it contains the detailed planning of the project in various aspects.
- Project Charter: It is a concise document that outlines the project's purpose, objectives, stakeholders, and high-level plan, serving as a formal authorization and guiding tool for project initiation and execution.
- WBS: It means Work Breakdown Structure and it is a hierarchical decomposition of the project deliverables, tasks, and sub-tasks, providing a visual representation of the project scope and enabling effective planning, organizing, and tracking of work.
- RFP: It means Request for Proposal and it is a document that solicits bids from potential vendors or contractors by outlining project requirements, scope of work, and evaluation criteria.
- PO: It means Purchase Order and it is a legally binding document issued by a buyer to a seller, specifying the details of goods or services to be purchased, including quantities, prices, terms, and delivery dates.
- DRR: It means Decommissioning Readiness Review and it is a comprehensive evaluation process conducted to assess the readiness of a system, facility, or project for decommissioning, ensuring that all necessary requirements, plans, and preparations are in place prior to decommissioning activities.
- KPI: It means Key Performance Indicator and it is quantifiable metrics used to measure the success or effectiveness of an organization, project, or process in achieving its objectives.
- CI/CD: It means Continuous Integration/Continuous Deployment and it is a software development practice that involves automating the build, testing, and deployment of applications to enable frequent and reliable delivery of software updates.
- RTM: It means Requirements Traceability Matrix and it is a document that establishes the relationship between project requirements and other project deliverables to ensure comprehensive coverage and traceability throughout the project lifecycle.
- SPI: It means Schedule Performance Index and it is a metric used in project management to measure the efficiency and progress of the project schedule by comparing the earned value of completed work to the planned value.
- CPI: It means Cost Performance Index and it is a metric used in project management to measure the efficiency of budget utilization by comparing the value of work completed to the actual cost spent.

PROJECT CONTEXT

Process Model

The Process Model of Alize defines the systematic approach and set of activities that will be followed throughout the project's lifecycle. It outlines the sequence of steps, dependencies, and interactions between different processes and activities involved in the project. The specific details of Alize's Process Model may vary depending on the chosen methodology or framework. It may include activities such as project initiation, requirements gathering, design, development, testing, deployment, and maintenance. The Process Model provides guidelines and standards for project execution, ensuring consistency, quality, and successful project delivery.

Process Improvement

Process improvement aimed at continuously enhancing the project's processes and driving efficiency, effectiveness, and quality. It involves a systematic approach to assess, analyze, and optimize the existing processes, with the goal of achieving better project outcomes.

Periodic Assessment: The project team will periodically assess the project's effectiveness and procedures. This evaluation may involve looking at project KPIs, getting input from stakeholders, running audits, and pinpointing areas that want improvement.

Problem Identification: The project team will identify persistent problems, bottlenecks, or inefficiencies within the project processes through root cause analysis and problem resolution planning. Process improvement activities are started based on these issues.

Improvement Opportunities: The project team will look at potential chances for improvement based on the identified issues. To create ideas for improving the procedures, this entails brainstorming sessions, workshops, and group discussions. The goal is to identify workable solutions that deal with the underlying issues and provide quantifiable advantages.

Plan Development: The project team will create thorough improvement plans after identifying improvement opportunities. These plans specify the precise steps, materials, and timetables needed to carry out the suggested adjustments. They can involve changing current procedures, implementing fresh equipment or technology, or redefinition of roles and duties.

Implementation: The project team works closely together to carry out the improvement initiatives, following the established timetables and bringing in the appropriate stakeholders as necessary. To enable smooth transitions, this may entail training sessions, revisions to the process documentation, and efforts to communicate.

Monitoring and Evaluation: The project team keeps tabs on the effects of the process improvements throughout the implementation period. Key performance indicators are tracked to measure the effectiveness of the changes and assess whether the desired outcomes are being achieved. This feedback loop allows for ongoing adjustments and fine-tuning of the processes.

Infrastructure and Enabling Systems

Hardware: The project utilizes high-performance workstations, servers, and networking devices to provide a reliable and efficient computing environment. State-of-the-art hardware components are employed to handle the demanding computational requirements of the development team.

Software Tools: Alize leverages a range of industry-leading software tools to streamline development tasks and ensure code quality. An example of such a tool is JetBrains IntelliJ IDEA, a powerful integrated development environment (IDE) that offers advanced code editing, debugging, and version control capabilities.

Version Control System: The project relies on Git, a widely adopted distributed version control system, to manage source code and track changes. Git provides a secure and efficient environment for collaboration, allowing developers to work simultaneously on different features and merge their changes seamlessly.

Development Environments: Alize developers utilize cutting-edge development environments tailored to their specific needs. JetBrains offers sophisticated features, including code auto-completion, real-time error detection, and built-in testing frameworks.

Continuous Integration and Deployment (CI/CD) Pipeline: Alize implements a comprehensive CI/CD pipeline using tools like GitLab CI/CD. This pipeline automates the build, testing, and deployment processes, providing a streamlined workflow for the development team. Continuous integration ensures that code changes are promptly integrated and tested, while continuous deployment enables efficient and frequent software releases.

Methods, Tools and Techniques

Development Methodology:

- The project will adopt a plan-driven approach, the Waterfall development method. This sequential approach will ensure that each phase, such as requirements analysis, design, development, testing, and deployment, is completed sequentially.

Programming Languages and Notations:

- In web application development, Spring Boot and Angular will be used.

- Spring Boot will be used as a Java-based framework on the backend of the project.
- Angular will be used as a TypeScript-based framework for building UI and interactions on the frontend of the project.
- The mobile application will be developed with Flutter.

Tools and Techniques:

- Jira project management tool will be used for project management. This tool will support processes such as task tracking, scheduling, team communication, and project progress monitoring.
- Git will be used for code management and version control. This will allow team members to easily share code, merge it, and track changes.
- Selenium will be used for test automation. This tool will improve the quality of software by automating user interface tests.
- Confluence will be used for documentation. This will allow to easily share the project's requirements, designs and user manuals.

Product Acceptance

Backend and Database Acceptance: The backend system and database undergo a series of tests and inspections. The team verifies that the backend system is properly integrated with the database, ensuring smooth data retrieval and storage. Performance testing is conducted to evaluate the system's responsiveness under various load conditions. Additionally, security measures are thoroughly examined to safeguard user data.

Web Application Acceptance: The web application is subjected to extensive testing to validate its functionality, user experience, and compatibility across different browsers and devices. The team ensures that all features and modules of the web application are working as intended. Usability testing is conducted to gather feedback from potential users and make necessary improvements.

Mobile Application Acceptance: The iOS and Android mobile applications undergo rigorous testing on respective devices and simulators. The team verifies that the applications meet platform-specific design guidelines and performance standards. Functional testing, including features like user authentication, data synchronization, and push notifications, is conducted to ensure a seamless user experience. Compatibility testing is performed across different device models and operating system versions.

User Acceptance Testing: Once the individual components have passed their respective acceptance tests, the team proceeds with user acceptance testing. A selected group of end users, representing the target audience of the Alize platform, are invited to test the complete system. They explore the functionalities, provide feedback, and

report any issues or suggestions for improvement. The team incorporates the feedback into the final refinement and bug-fixing phase.

Final Review and Approval: Based on the results of the acceptance tests and user feedback, the project team conducts a final review to ensure that all requirements and acceptance criteria have been met. The project stakeholders, including the client and other relevant parties, review the deliverables and provide their final approval for the product acceptance.

Project Organization

General

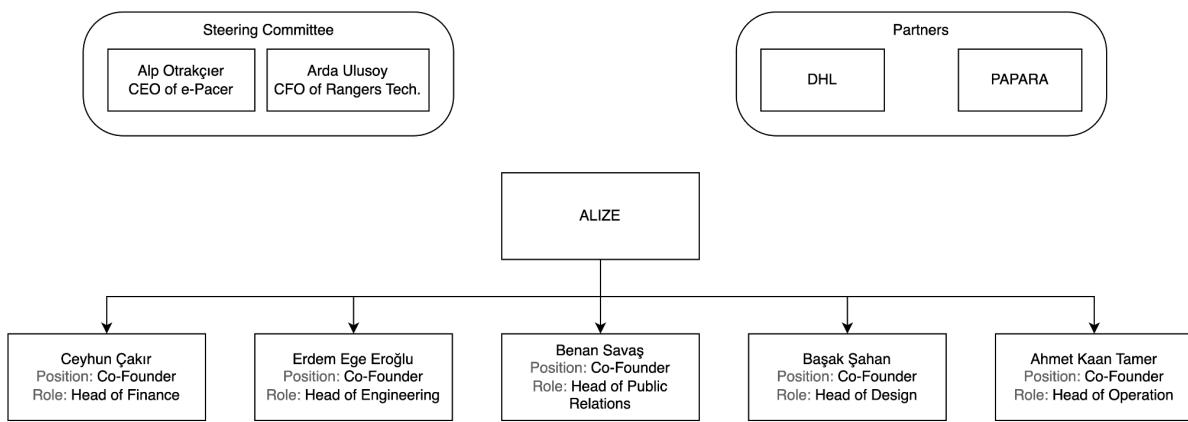


Figure 1: General View of Project Organization

External Interfaces

The External Interfaces table illustrates the connection between Alize and Epacer, a subsidiary of Rangers Holding. Epacer plays a vital role in the Alize project, bringing valuable expertise and resources. This collaboration allows Alize to benefit from Epacer's technical assistance and industry knowledge, enhancing product offerings and expanding market reach. The partnership between Alize and Epacer strengthens both parties and facilitates successful project implementation and growth.

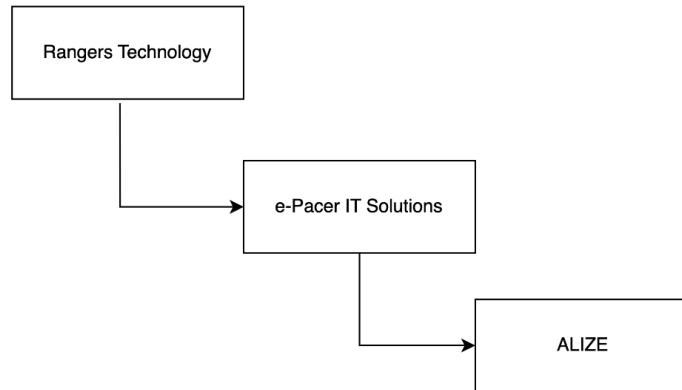


Figure 2: External Interfaces

Internal Interfaces

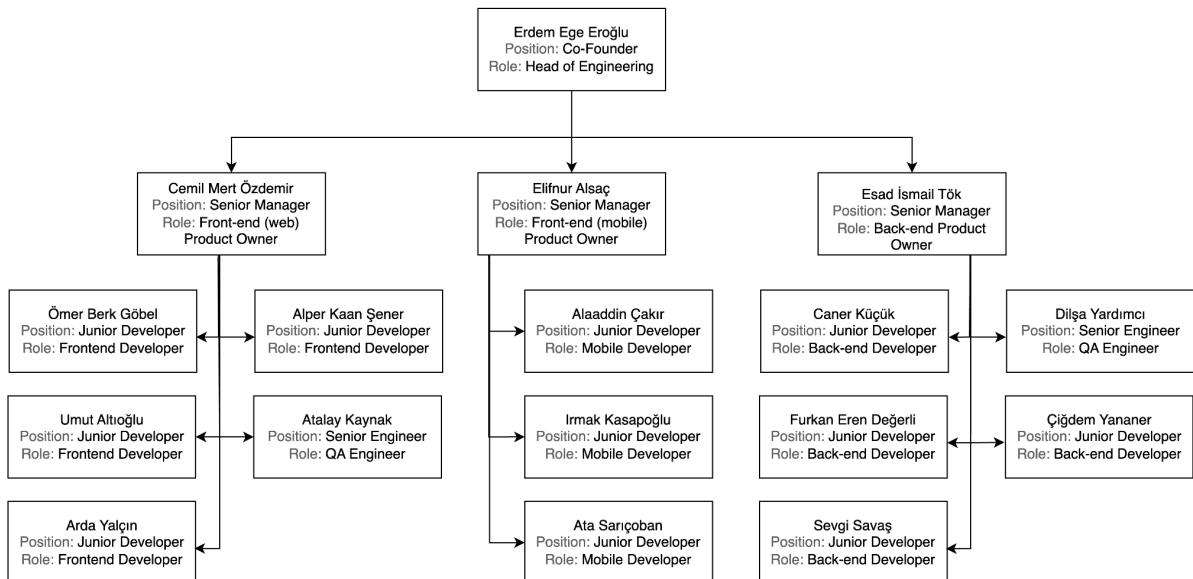


Figure 3: Internal Interfaces

Authorities and Responsibilities

| Work Activity/Process | Authority |
|--------------------------------|--------------------|
| Backend Development | Esad İsmail Tök |
| Web Application Interface | Cemil Mert Özdemir |
| Mobile Application Development | Elifnur Alsaç |
| Database Management | Esad İsmail Tök |

Table 2: Authorities and Responsibilities

PROJECT PLANNING

General

The Project Planning section of the Project Management Plan (PMP) provides a comprehensive overview of the project management processes for the software engineering project. This section outlines the key details related to the planning phase, ensuring alignment with the project's scope and objectives.

The purpose of this section is to establish a solid foundation for the project's success by defining the essential plans and strategies that guide its execution, assessment, and control. It encompasses various sections, including project initiation and project work plans. Inside those sections, estimations regarding the project initiations, staffing plans, and resource acquisition plans are included. Also the work activities, schedule, resource, and budget allocation plans are included in the project work plans section together with procurement and disposal plans. These plans collectively ensure a structured approach to project management, facilitating effective coordination and control throughout the project lifecycle.

Project Initiation

General

This section of the PMP outlines the key details related to the project planning phase. It includes the following:

- Estimation of project scope: This section specifies the cost and schedule for conducting the project, including the methods, tools, and techniques used to estimate project cost, schedule, and resource requirements. The basis of estimation is also outlined, as well as the methods, tools, and techniques for periodically re-estimating the cost, schedule, and resources needed to complete the project.
- Required staffing: This section specifies the number of staff required by skill level, the project phases in which the numbers of personnel and types of skills are needed, and the duration of need. It also specifies the sources of staff personnel, such as internal transfer, new hire, or contracted, and details how personnel from other companies or the customer will be hosted along with the project team.
- Plan for acquiring resources: This section specifies the plan for acquiring and releasing resources in addition to personnel needed to successfully complete the project. It includes a description of the resource acquisition and release process, including assignment of responsibility for all aspects of resource acquisition. The plan should include, but not be limited to, acquisition and release plans for equipment, computer hardware and software, training, service contracts, transportation, facilities, and administrative and janitorial services.

- Plan for project staff training: This section specifies the training needed to help ensure that necessary skill levels in sufficient numbers are available to successfully conduct the project. The training schedule includes the types of training to be provided, numbers of personnel to be trained, entry and exit criteria for training, and the training method, such as lectures, consultations, mentoring, or computer-assisted training. It includes training as needed in both technical and managerial skills.

Depending on the size and scope of the project, these plans may be incorporated directly or by reference to other plans. The purpose of this section is to provide a high-level overview of the project planning phase and the key details related to it.

Estimation

1. Cost Estimation:

Monthly Staff Payment Expenses:

- Front-end developer: 4 people/month at 13,000 TL/month = 52,000 TL
- Back-end developer: 4 people/month at 14,000 TL/month = 56,000 TL
- Mobile developer: 3 people/month at 14,000 TL/month = 42,000 TL
- QA engineer: 2 people/month at 15,000 TL/month = 30,000 TL
- Project manager: 3 people/month at 25,000 TL/month = 75,000 TL

Staff Payment Expenses by Project Phases:

- Project Initiation (QA Engineers, Project Managers): 105,000 TL
- Requirements Engineering (Back-end Engineers, QA Engineers, Project Managers): 161,000 TL
- System Design (Front-end Engineers, Mobile Engineers, QA Engineers, Project Managers): 199,000 TL
- Implementation (Front-end Engineers, Mobile Engineers, Back-end Engineers, Project Managers): 225,000 TL
- Testing (Front-end Engineers, Mobile Engineers, Back-end Engineers, QA Engineers, Project Managers): 255,000 TL
- Deployment (Front-end Engineers, Mobile Engineers, Back-end Engineers, Project Managers): 225,000 TL
- Maintenance and Support (Front-end Engineers, Mobile Engineers, Back-end Engineers, QA Engineers, Project Managers): 255,000 TL

Cumulative Other Expenses:

- Training: 20,000 TL
- Equipment: 17,875 TL
- Computer Hardware and Software: 8,257 TL
- Service Contracts: 80,000 TL
- Transportation: 6,396 TL
- Facilities: 7,530 TL
- Administrative and Janitorial Services: 2300 TL

Total Expenses:

- ❖ Staff Payment Expenses in Total: 1,461,000
- ❖ Other Expenses in Total: 142,358

Profit Margin:

- The profit margin is calculated based on the total budget. In this case, 10% of the total budget (Staff Payment Expenses + Other Expenses) = 160,336 TL.

Total Budget:

- Sum up the Staff Payment Expenses, Other Expenses, and Profit Margin to calculate the total budget:

$$\text{Staff Payment Expenses (1,461,000 TL)} + \text{Other Expenses (142,358 TL)} \\ + \text{Profit Margin (160,336 TL)} = 1,763,694 \text{ TL}$$

- Methods: We use a bottom-up approach to estimate the project cost by breaking down the engineering expenses into individual roles (front-end developer, back-end developer, mobile developer, QA engineer, project manager) and multiplying them by their respective rates and then including the other expense items on top of the engineering expenses.
- Tools and Techniques: We will use a project management software tool, such as Microsoft Project, to track costs and budget throughout the project lifecycle. We will also apply industry benchmarks, historical data, and expert judgment to validate and refine the cost estimates.
- Basis of Estimation: The basis of estimation for cost includes the number of team members per role and their corresponding monthly rates, which are derived from the project staffing plan and resource cost information. We may also consider factors such as inflation rates, market rates for similar roles, and any contractual agreements with the team members or vendors.

2. Schedule Estimation:

In our project we use a plan driven approach and we divide our project into several phases as the waterfall model suggests. The phases of our project are:

- I. Project Initiation
- II. Requirements Engineering
- III. System Design
- IV. Implementation
- V. Testing
- VI. Deployment
- VII. Maintenance and Support

In order to provide a better schedule estimation the expanded scheduling of the waterfall processes can be seen below. The full and detailed work breakdown structure can be found in the Work Activities section of this report.

- I. Project Initiation
 - Define project objectives and scope
 - Identify stakeholders
 - Prepare project charter
 - Prepare project management plan
 - Obtain project sponsor approval
- II. Requirements Engineering
 - Conduct user interviews and workshops
 - Elicit functional requirements
 - Elicit non-functional requirements
 - Prepare requirement analysis report
 - Review and obtain requirements analysis approval
- III. System Design
 - Prepare high-level design report
 - Prepare low-level design report
 - Review and obtain design report approval
- IV. Implementation
 - Set-up development environment
 - develop back-end of the system
 - Implement the admin panel and connect it to back-end system
 - Implement the responsive mobile application and connect it to back-end
 - Implement the front-end of the web application and connect it to back-end
 - Perform code review and obtain code approval
- V. Testing
 - Develop test plan and test cases
 - Perform unit testing
 - Perform integration testing
 - Perform system testing

- Obtain testing approval
- VI. Deployment
- Prepare deployment plan
 - Install and configure the system
 - Perform acceptance testing
 - Obtain acceptance approval
- VII. Maintenance and Support
- Establish ongoing support procedures
 - Monitor system performance and security
 - Control system performance and security

- Methods: We create a detailed project schedule by considering the tasks and activities involved in each phase of the waterfall process (requirements gathering and analysis, design and architecture, implementation, testing, deployment, maintenance and support).
- Tools and Techniques: We will use a project management software tool, such as Microsoft Project, to develop and track our project schedule. We will also use project scheduling templates to facilitate the process.
- Basis of Estimation: The basis of estimation for the project schedule includes the breakdown of tasks and activities identified in the project plan. We may take into account historical data, industry benchmarks, and expert judgment to determine the time required for each task and phase.

3. Resource Estimation:

In order to keep the project going and be completed at the end, we need resources that we can make use of during the project phases. The resources that are in the consideration are: Training Resources, Equipment Resources, Computer Hardware and Software Resources, Service Contract Resources, Transportation Resources, Facility Resources, Administrative and Janitorial Service Resources. Those resources should be decided and resource requirements of the project should be well estimated. More Information about project resources can be found on Resource Allocation section of Project Management Plan (PMP).

Below are the methods, tools and techniques, and baseline for the resource estimation. More information about the resource requirements can be found in the Resource Acquisition section of the report.

- Methods: We will use a combination of top-down and bottom-up resource estimation methods, which involves estimating the overall resource requirements for the project and then breaking it down into individual tasks and work packages.

- Tools and Techniques: We will use a project management software tool, such as Microsoft Project, to track resource allocation throughout the project lifecycle. We will also use resource estimating templates and historical data to inform our estimates.
- Basis of Estimation: Our resource estimates will be based on historical data, team member availability, and our team's experience with similar projects.

4. Re-Estimation:

There should be periodical re-estimations in order to ensure that the cost, schedule, and resource requirements are still valid. The methods, tools and techniques, and basis for the re-estimation are described below:

- Methods: We will conduct regular status updates and progress reports to identify any changes or delays in the project timeline or resource requirements. We will use this information to re-estimate the project cost, schedule, and resource requirements as needed.
- Tools and Techniques: We will use a project management software tool, such as Microsoft Project, to update and revise our project plan as necessary.
- Basis of Re-Estimation: Our re-estimates will be based on updated project data, team member feedback, and our team's experience with similar projects.

5. Confidence Levels:

The estimations explained above must be within a confidence level and that confidence level must be examined and determined with relevant methods, tools and techniques, and basis. Those items are also explained below:

- Methods: We use historical data, expert judgment, and statistical techniques to determine confidence levels for the cost and schedule estimates.
- Tools and Techniques: We apply quantitative risk analysis tools and project management software with built-in risk analysis capabilities. We also conduct sensitivity analysis to assess the variability and confidence in the estimates.
- Basis of Estimation: Confidence levels are determined based on the accuracy and reliability of the data used for estimation, the level of uncertainty and risk associated with the project, and the project team's experience and expertise.

Staffing

1. Staffing Needs:

- Skill Level: We will need front-end developers (senior), back-end developers (junior), mobile developers (intermediate), QA engineers (senior), and a project manager (senior).
- Number of Staff: We will need 4 senior front-end developers, 4 junior back-end developers, 3 junior mobile developers, 2 senior QA engineers, and 3 senior project managers.
- Project Phases: We will need the relevant staff throughout the relevant phases of the project lifecycle.

2. Staffing Sources:

- We will try to source staff internally before seeking external candidates. In the current plan, the only staff is the ones with internally sourced.

According to the above specifications, table below represents the table of the staffing requirements of the project.

| Staff Type | Skill Level | Number Required | Project Phases | Duration of Need | Staffing Source |
|---------------------|-------------|-----------------|--|------------------|-----------------|
| Front-end Developer | Senior | 4 | Initiation (Only Training), Design, Implementation, Testing, Deployment, Maintenance and Support | 37 weeks | Internal |
| Back-end Developer | Junior | 4 | Initiation (Only Training), Requirements Engineering, Implementation, Testing, Deployment, Maintenance and Support | 29 weeks | Internal |
| Mobile Developer | Junior | 3 | Initiation (Only Training), Design, Implementation, | 37 weeks | Internal |

| | | | | | |
|-----------------|--------|---|--|----------|----------|
| | | | Testing, Deployment, Maintenance and Support | | |
| QA Engineer | Senior | 2 | Initiation, Requirements Engineering, Design, Testing, Maintenance and Support | 34 weeks | Internal |
| Project Manager | Senior | 3 | All Phases | 41 weeks | Internal |

Table 3: Staffing Information

Resource Acquisition

The resource acquisition plan will include acquisition and release plans for the following resources:

- Training
- Equipment
- Computer hardware and software
- Service contracts
- Transportation
- Facilities
- Administrative and janitorial services

More information about resource acquisition can be found on the Resource Allocation section of Project Management Plan (PMP).

The following sections will describe each item in detail.

1. Training:

Resource Description:

- Type of Resource: Software Development Trainers/Instructors for Technical Skills Training and Management Trainers/Instructors for Managerial Skills Training.
- Description: Trainers with expertise in software engineering principles, programming languages, software development methodologies, and relevant technologies are assigned as trainers for the training type of

Technical Skills Training. Trainers with expertise in leadership, communication, conflict resolution, and other relevant managerial areas are assigned as trainers for the training type of Managerial Skills Training

Resource Acquisition Process (Step by Step):

- Identify the training needs and specific topics to be covered.
- Determine the preferred training delivery method (e.g., on-site training, virtual training, self-paced online courses).
- Research and evaluate potential training providers or trainers.
- Issue a request for proposal (RFP) or conduct interviews to assess the trainers' qualifications and experience.
- Select the most suitable trainers based on their expertise, teaching approach, and training materials.
- Negotiate and finalize the contract or agreement with the selected trainers.

Resource Release Process (Step by Step):

- Review the project schedule and identify the points when the training services will no longer be required.
- Notify the trainers about the end of their engagement and the expected completion date.
- Conduct a knowledge transfer session, if necessary, to ensure a smooth transition of any project-specific information or documentation.

Resource Acquisition and Release Schedule:

- Training resource acquisition will be done at the beginning of the Staff Training activity.
- Training resource release will be done at the end of the Staff Training activity.

Constraints on Resource Acquisition:

- Budget Limitations: Ensure that the acquisition of training resources stays within the approved project budget.
- Availability of Qualified Trainers: Identify potential trainers and confirm their availability within the project timeline.
- Geographical Constraints: Consider any limitations in accessing trainers in specific locations, if applicable.

Responsibilities:

- Project Manager is responsible for all aspects of resource acquisition and release.

2. Equipment

Resource Description:

- Type of Resource: Software Development Equipment
- Description: Equipment required for software development activities, such as computers, servers, software licenses, testing devices, and peripherals.

Resource Acquisition Process (Step by Step):

- Identify the specific equipment requirements based on the project needs, technical specifications, and software development tools.
- Research and evaluate potential equipment suppliers or vendors.
- Request quotations or proposals from the selected suppliers.
- Assess the suitability, quality, and cost-effectiveness of the proposed equipment options.
- Negotiate pricing, warranty, and support agreements with the preferred supplier(s).
- Place orders for the equipment, ensuring compliance with procurement policies and procedures.
- Coordinate delivery and installation of the equipment.

Resource Release Process (Step by Step):

- Determine the project stage or timeline when the equipment will no longer be needed.
- Evaluate the disposition options for the equipment, such as reuse, repurposing, or disposal.
- Arrange for the proper removal, decommissioning, or transfer of the equipment as per organizational guidelines.

Resource Acquisition and Release Schedule:

- Equipment resource acquisition will be done at the beginning of each Level-2 work activity in the WBS of the project.
- Equipment resource release will be done at the end of each Level-2 work activity in the WBS of the project.

Constraints on Resource Acquisition:

- Budget Limitations: Ensure that the acquisition of equipment remains within the approved project budget.
- Compatibility and Integration: Verify that the acquired equipment is compatible with existing infrastructure and software tools.

- Lead Time: Consider lead times for equipment procurement and delivery to avoid delays in project execution.

Responsibilities:

- Project Manager is responsible for all aspects of resource acquisition and release.

3. Computer Hardware and Software

Resource Description:

- Type of Resource: Computer Hardware and Software
- Description: Hardware components and software tools necessary for software development, including computers, servers, operating systems, development environments, version control systems, integrated development environments (IDEs), and testing tools.

Resource Acquisition Process (Step by Step):

- Identify the specific hardware and software requirements based on the project needs, technical specifications, and software development tools.
- Determine the preferred vendors or suppliers for the required hardware and software.
- Research and evaluate the available options for computer hardware and software solutions.
- Request quotations or proposals from the selected vendors, specifying the required hardware specifications and software licenses.
- Evaluate the proposed solutions based on factors such as functionality, compatibility, scalability, support, and cost.
- Negotiate pricing, warranty, licensing terms, and support agreements with the preferred vendors.
- Place orders for the hardware components and software licenses, ensuring compliance with procurement policies and procedures.
- Coordinate delivery, installation, and configuration of the hardware and software resources.

Resource Release Process (Step by Step):

- Determine the project stage or timeline when the hardware and software resources will no longer be needed.
- Conduct a review to assess if any hardware components or software licenses can be repurposed or redeployed for future projects.
- If necessary, arrange for the proper removal, decommissioning, or transfer of the hardware and software resources, following organizational guidelines.

Resource Acquisition and Release Schedule:

- Computer Hardware and Software resource acquisition will be done at the beginning of each Level-2 work activity in the WBS of the project except the following work activities: Obtain Project Sponsor Approval, Review and Obtain Requirements Analysis Approval, and Review and Obtain Design Report Approval.
- Computer Hardware and Software resource release will be done at the end of each Level-2 work activity in the WBS of the project except the following work activities: Obtain Project Sponsor Approval, Review and Obtain Requirements Analysis Approval, and Review and Obtain Design Report Approval.

Constraints on Resource Acquisition:

- Budget Limitations: Ensure that the acquisition of computer hardware and software remains within the approved project budget.
- Compatibility and Integration: Verify that the acquired hardware and software resources are compatible with existing infrastructure and meet the project's technical requirements.
- Licensing Compliance: Ensure that the software licenses obtained adhere to the project's licensing policies and any usage restrictions.

Responsibilities:

- Project Manager is responsible for all aspects of resource acquisition and release.

4. Service Contracts

Resource Description:

- Type of Resource: Service Contracts
- Description: Service contracts required for outsourced or specialized services needed during the software engineering project, such as software testing, quality assurance, cybersecurity, technical support, or cloud hosting.

Resource Acquisition Process (Step by Step):

- Identify the specific services required based on project needs and determine the scope and duration of the service contracts.
- Research and identify potential service providers or vendors specializing in the required services.

- Request proposals or quotes from the selected service providers, clearly specifying the desired services and deliverables.
- Evaluate the proposals based on factors such as experience, expertise, track record, service level agreements (SLAs), pricing, and contract terms.
- Conduct vendor evaluations, including background checks, reference checks, and verification of certifications or accreditations.
- Negotiate contract terms, including service level agreements, pricing, payment terms, data security, confidentiality, and termination clauses.
- Finalize the service contracts with the selected service providers, ensuring compliance with procurement policies and legal requirements.
- Establish a mechanism for ongoing communication, reporting, and monitoring of the services provided by the contracted vendors.

Resource Release Process (Step by Step):

- Determine the project stage or timeline when the services provided by the contracted vendors will no longer be required.
- Evaluate the completion of services based on the defined deliverables and SLAs.
- Conduct a review of the service provider's performance and deliverables against the contracted terms.
- Initiate the contract closure process, ensuring all contractual obligations have been fulfilled, including final payments, return of proprietary information, and termination of access rights.

Resource Acquisition and Release Schedule:

- Service Contract resource acquisition will be done at the beginning of the following Level-2 work activities in the WBS of the project: Set-Up Development Environment, Install and Configure the System.
- Service contracts resource release will be done at the project termination.

Constraints on Resource Acquisition:

- Budget Limitations: Ensure that the acquisition of service contracts remains within the approved project budget.
- Quality and Reliability: Select service providers with a proven track record, references, and certifications relevant to the required services.
- Legal and Compliance Requirements: Ensure compliance with legal and regulatory obligations, including data protection and intellectual property rights.

Responsibilities:

- Project Manager is responsible for all aspects of resource acquisition and release.

5. Transportation

Resource Description:

- Type of Resource: Transportation Resources
- Description: Transportation resources required for the software engineering project, such as vehicles, transportation services, or logistics support to facilitate the movement of project personnel, equipment, or materials.

Resource Acquisition Process (Step by Step):

- Identify the transportation needs based on project requirements, including the movement of personnel, equipment, or materials.
- Assess the transportation options available, considering factors such as distance, volume, timeline, and budget.
- Research and evaluate potential transportation service providers, including logistics companies, rental agencies, or in-house transportation teams.
- Request quotations or proposals from the selected providers, specifying the transportation requirements, timeline, and any specific needs or constraints.
- Evaluate the proposals based on factors such as availability, capacity, reliability, cost-effectiveness, and compliance with safety regulations.
- Negotiate pricing, service level agreements (SLAs), insurance coverage, and any additional terms or conditions with the preferred transportation service provider.
- Finalize the transportation contracts, ensuring compliance with procurement policies and legal requirements.
- Establish clear communication channels and coordination mechanisms with the transportation service provider for efficient logistics management.

Resource Release Process (Step by Step):

- Determine the project stage or timeline when the transportation resources will no longer be needed.
- Coordinate with the transportation service provider to arrange the return or release of any rented vehicles or equipment.
- Review and reconcile any outstanding invoices or payments related to transportation services received during the project.

Resource Acquisition and Release Schedule:

- Transportation resource acquisition will be done at the beginning of each Level-2 work activity in the WBS of the project except the Staff Training work activities.
- Transportation resource release will be done at the end of each Level-2 work activity in the WBS of the project except the Staff Training work activities.

Constraints on Resource Acquisition:

- Budget Limitations: Ensure that the acquisition of transportation resources remains within the approved project budget.
- Compliance and Safety: Verify that the transportation service provider meets the necessary legal requirements, licenses, permits, and insurance coverage.
- Availability and Capacity: Consider the availability and capacity of transportation resources, especially during peak periods or in remote locations.

Responsibilities:

- Project Manager is responsible for all aspects of resource acquisition and release.

6. Facilities

Resource Description:

- Type of Resource: Facilities Resources
- Description: Facilities and infrastructure required to support the software engineering project, such as office space, meeting rooms, laboratories, data centers, or specialized facilities for development, testing, or deployment activities.

Resource Acquisition Process (Step by Step):

- Identify the specific facilities requirements based on the project needs, including space, infrastructure, and technical specifications.
- Assess the available options for facilities, considering factors such as location, size, layout, amenities, security, and compliance with regulations.
- Research and evaluate potential facility providers, including real estate agents, facility management companies, or in-house facilities teams.
- Request proposals or quotations from the selected providers, clearly specifying the required facilities and any specific needs or constraints.
- Evaluate the proposals based on factors such as suitability, availability, cost, lease terms, maintenance, and support services.

- Negotiate lease agreements, including rental rates, lease duration, renewal options, service level agreements, and any additional terms or conditions.
- Finalize the facility contracts, ensuring compliance with procurement policies and legal requirements.
- Coordinate with the facility provider for necessary setup and customization of the facilities to meet the project requirements.

Resource Release Process (Step by Step):

- Determine the project stage or timeline when the facilities resources will no longer be needed.
- Coordinate with the facility provider to terminate or transition the lease agreement and return the facilities in accordance with the contractual terms.
- Conduct a review to ensure all outstanding payments or obligations related to the facilities are settled.

Resource Acquisition and Release Schedule:

- Facilities resource acquisition will be done at the beginning of each Level-2 work activity in the WBS of the project except the Staff Training work activities.
- Facilities resource release will be done at the end of each Level-2 work activity in the WBS of the project except the Staff Training work activities.

Constraints on Resource Acquisition:

- Budget Limitations: Ensure that the acquisition of facilities resources remains within the approved project budget.
- Space and Infrastructure Requirements: Verify that the selected facilities meet the necessary specifications and comply with safety and accessibility regulations.
- Availability and Timing: Consider the availability and timing of the facilities, especially during peak periods or in high-demand locations.

Responsibilities:

- Project Manager is responsible for all aspects of resource acquisition and release.

7. Administrative and janitorial services

Resource Description:

- Type of Resource: Administrative and Janitorial Services Resources

- Description: Administrative and janitorial services required to support the software engineering project, such as office administration, receptionist services, cleaning, maintenance, and other related tasks.

Resource Acquisition Process (Step by Step):

- Identify the specific administrative and janitorial service requirements based on the project needs, including tasks, frequency, and scope.
- Assess the available options for service providers, considering factors such as experience, reputation, availability, and pricing.
- Research and evaluate potential service providers, including professional service companies or in-house service teams.
- Request proposals or quotations from the selected providers, clearly specifying the required services and any specific needs or constraints.
- Evaluate the proposals based on factors such as service quality, reliability, pricing, flexibility, and compliance with legal and safety regulations.
- Negotiate service agreements, including service levels, pricing, duration, termination clauses, and any additional terms or conditions.
- Finalize the service contracts, ensuring compliance with procurement policies and legal requirements.
- Coordinate with the service provider for necessary setup and onboarding, including access to the premises and required training.

Resource Release Process (Step by Step):

- Determine the project stage or timeline when the administrative and janitorial services resources will no longer be needed.
- Coordinate with the service provider to terminate or transition the service agreement in accordance with the contractual terms.
- Conduct a review to ensure all outstanding payments or obligations related to the services are settled.

Resource Acquisition and Release Schedule:

- Administrative and janitorial services resource acquisition will be done at the beginning of the following Level-2 work activities in the WBS of the project: Prepare Project Charter, Prepare Project Management Plan, Obtain Project Sponsor Approval, Prepare Requirements Analysis Report, Review and Obtain Requirements Analysis Approval, Prepare High-Level Design Report, Prepare Low-Level Design Report, Review and Obtain Design Report Approval, Perform Code Review and Obtain Code Approval, Develop Test Plan and Test Cases, Obtain Testing Approval, Prepare Deployment Plan, Perform Acceptance Testing, Obtain Acceptance Approval, Establish Ongoing Support Procedures.

- Administrative and janitorial services resource release will be done at the end of the following Level-2 work activities in the WBS of the project: Prepare Project Charter, Prepare Project Management Plan, Obtain Project Sponsor Approval, Prepare Requirements Analysis Report, Review and Obtain Requirements Analysis Approval, Prepare High-Level Design Report, Prepare Low-Level Design Report, Review and Obtain Design Report Approval, Perform Code Review and Obtain Code Approval, Develop Test Plan and Test Cases, Obtain Testing Approval, Prepare Deployment Plan, Perform Acceptance Testing, Obtain Acceptance Approval, Establish Ongoing Support Procedures.

Constraints on Resource Acquisition:

- Budget Limitations: Ensure that the acquisition of administrative and janitorial services resources remains within the approved project budget.
- Quality and Reliability: Select service providers with a proven track record, references, and certifications relevant to the required services.
- Legal and Compliance Requirements: Ensure compliance with legal and regulatory obligations, including labor laws and safety regulations.

Responsibilities:

- Project Manager is responsible for all aspects of resource acquisition and release.

Project Staff Training

1. Training Needs:

- We will need to provide training to ensure that the necessary skill levels are available to successfully conduct the project. This will include both technical and managerial skills training.
- The number of personnel to be trained will depend on the staffing plan. We will ensure that all personnel have the necessary skills to perform their job functions effectively.

2. Training Schedule:

- Methods of Training: We will provide a variety of training methods to cater to different learning styles, including lectures, consultations, mentoring, and computer-assisted training.
- Numbers of Personnel to be Trained: We will provide training to all personnel identified in the staffing plan. The training type will vary according to the role of the staff in the project.
- Entry Criteria: Entry criteria for training will include a baseline assessment of each staff member's current skills and knowledge. The

staff will be examined by a detailed interview in the relevant topics which will reveal the level of need for the training for the staff.

- Exit Criteria: Exit criteria will be set for each training course to ensure that staff have achieved the desired learning outcomes before moving on to the next course.
- Duration of Training: The duration of the training will be estimated as 4 weeks for the Managerial Skills Training and Technical Skills Training.

3. Training Plan:

- Technical Skills Training: We will provide technical skills training to the staff with the roles of front-end developer, back-end developer, mobile developer, and QA engineer in areas such as software development, testing, project management tools and methodologies, and other relevant technical areas.
- Managerial Skills Training: We will provide managerial skills training to the staff with project manager roles in areas such as leadership, communication, conflict resolution, and other relevant managerial areas.
- During the training no payment will be done for the staff.

According to the above specifications, table below represents the table of the staff training requirements of the project.

| Training Type | Number of Personnel | Training Method | Entry Criteria | Exit Criteria | Duration |
|----------------------------|---------------------|---------------------------------------|---------------------|--|----------|
| Technical Skills Training | 13 | mentoring, computer-assigned training | Baseline assessment | Completion of course, demonstrated proficiency | 4 weeks |
| Managerial Skills Training | 3 | lectures, consultations | Baseline assessment | Completion of course, demonstrated proficiency | 4 weeks |

Table 4: Staff Training Information

Project Work Plans

General

The Project Work Plans section of the Project Management Plan (PMP) outlines the key aspects related to the execution and management of work activities within the software engineering project. This section provides a comprehensive overview of the

planned work activities, schedule, resource allocation, budget considerations, and procurement details.

The purpose of this section is to establish a clear roadmap for the project team, stakeholders, and other involved parties, outlining the specific tasks and activities required to achieve project objectives. By detailing the work activities, schedule, and resource requirements, this section ensures a systematic approach to project execution, enabling effective coordination, monitoring, and control throughout the project lifecycle.

Within this section, the work activities will be defined, breaking down the project scope into manageable components. Each work activity will be associated with a schedule duration, estimated resource requirements, and the work products to be produced. Additionally, dependencies between work activities will be identified, ensuring a logical sequencing of tasks for efficient execution.

Furthermore, the resource allocation aspect will outline the necessary resources, such as transportation, equipment, and tools, needed to carry out the work activities effectively. The budget considerations will encompass the estimated costs associated with project execution.

Additionally, the procurement details will highlight any external resources, services, or materials that need to be acquired to support project execution.

By delineating the work activities, schedule, resource allocation, budget, and procurement details in this section, the project team and stakeholders gain a comprehensive understanding of the project's operational plan. This facilitates effective decision-making, resource management, and coordination throughout the project, ultimately contributing to the successful delivery of the software engineering project.

Work Activities

The work that needs to be done for ALIZE are decided carefully and the work is divided into many separate work items, considering the flow of the plan driven approach that is the waterfall model. The major activities that are sophisticated and need more care are further divided into sub-activities. The resulting Work Breakdown Structure (WBS) of the ALIZE can be found in the figure below. The relevant sections in the Project Management Plan is designed and created according to the WBS of the project.

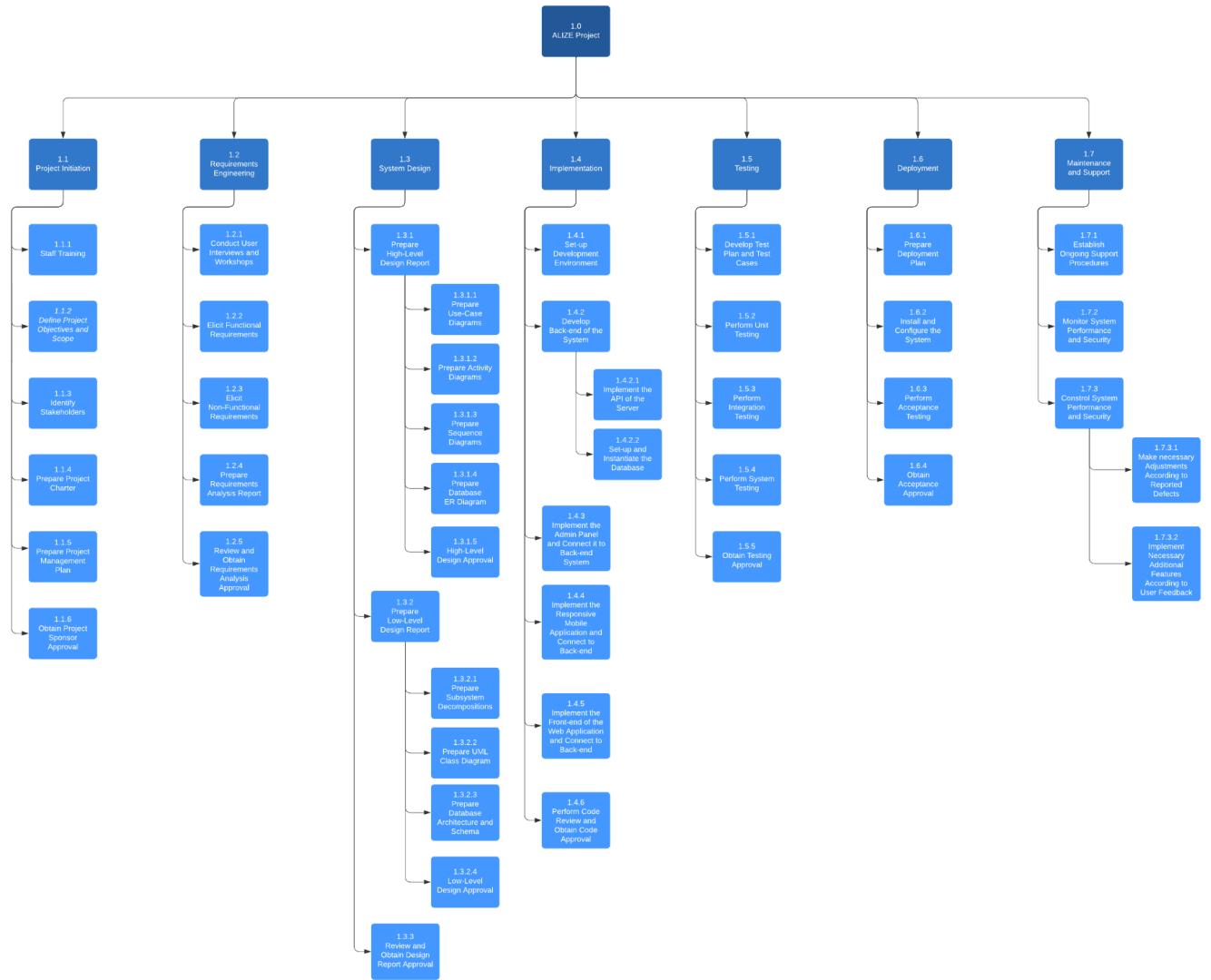


Figure 4: WBS of ALIZE

Schedule Allocation

Schedule allocation of the ALIZE is prepared using project GANTT chart and can be found below together with the activity id, activity name, start date, and end date. The diamond shapes in the diagram indicates a milestone, and the arrows indicate the dependencies. Since whole chart is quite large, it is divided into several figures. In order to see the whole picture better, the whole chart is also added at the end of this section.

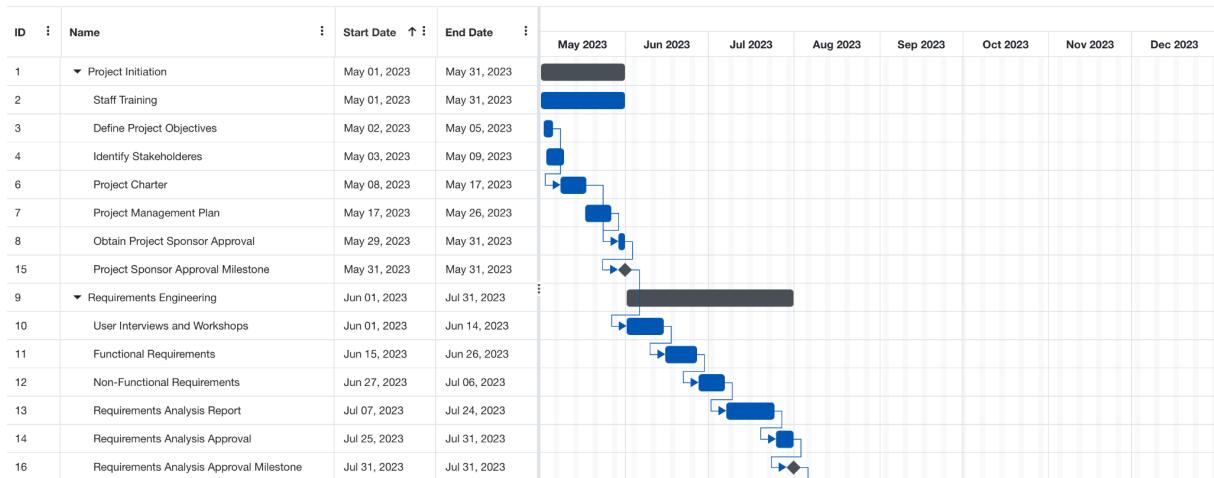


Figure 5: Schedule Gantt Chart of ALIZE for Project Initiation and Requirements Engineering Phases

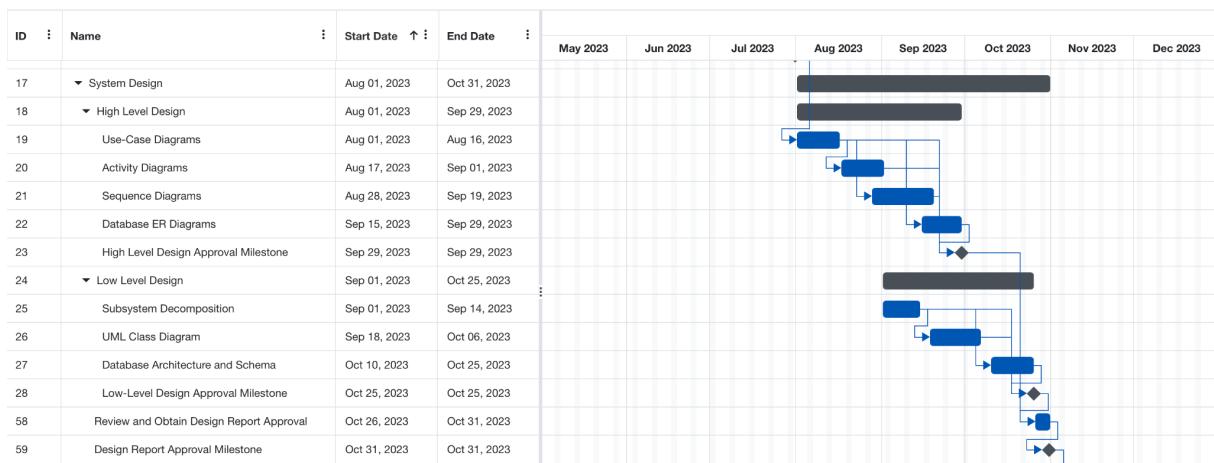


Figure 6: Schedule Gantt Chart of ALIZE for System Design Phase

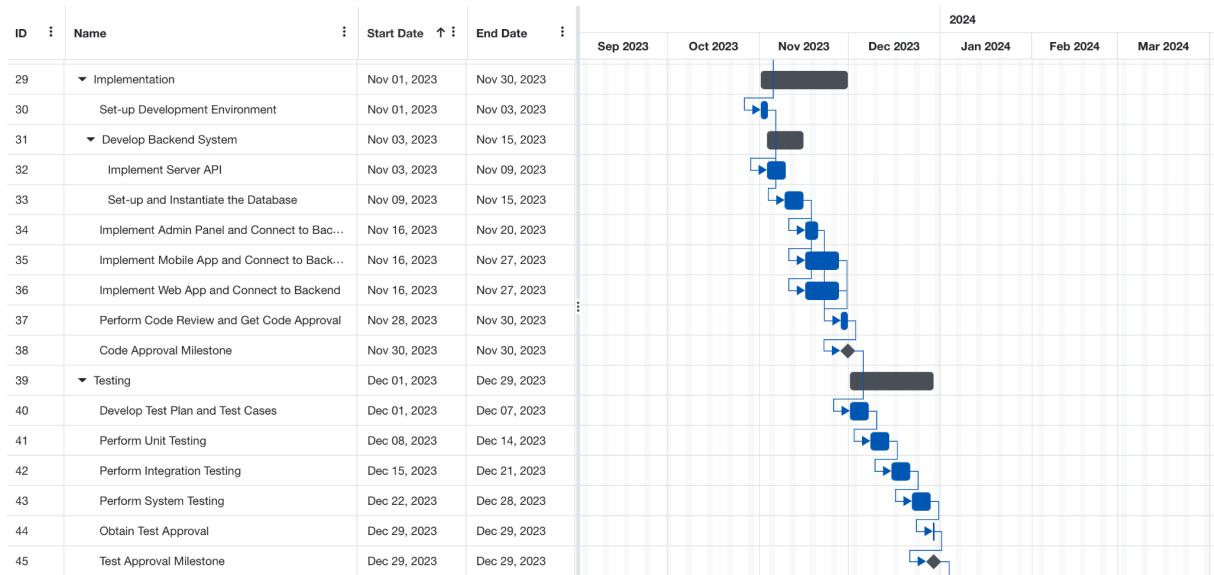


Figure 7: Schedule Gantt Chart of ALIZE for Implementation and Testing Phases



Figure 8: Schedule Gantt Chart of ALIZE for Deployment and Maintenance and Support Phases

The whole chart is below for the better understanding of the big picture:

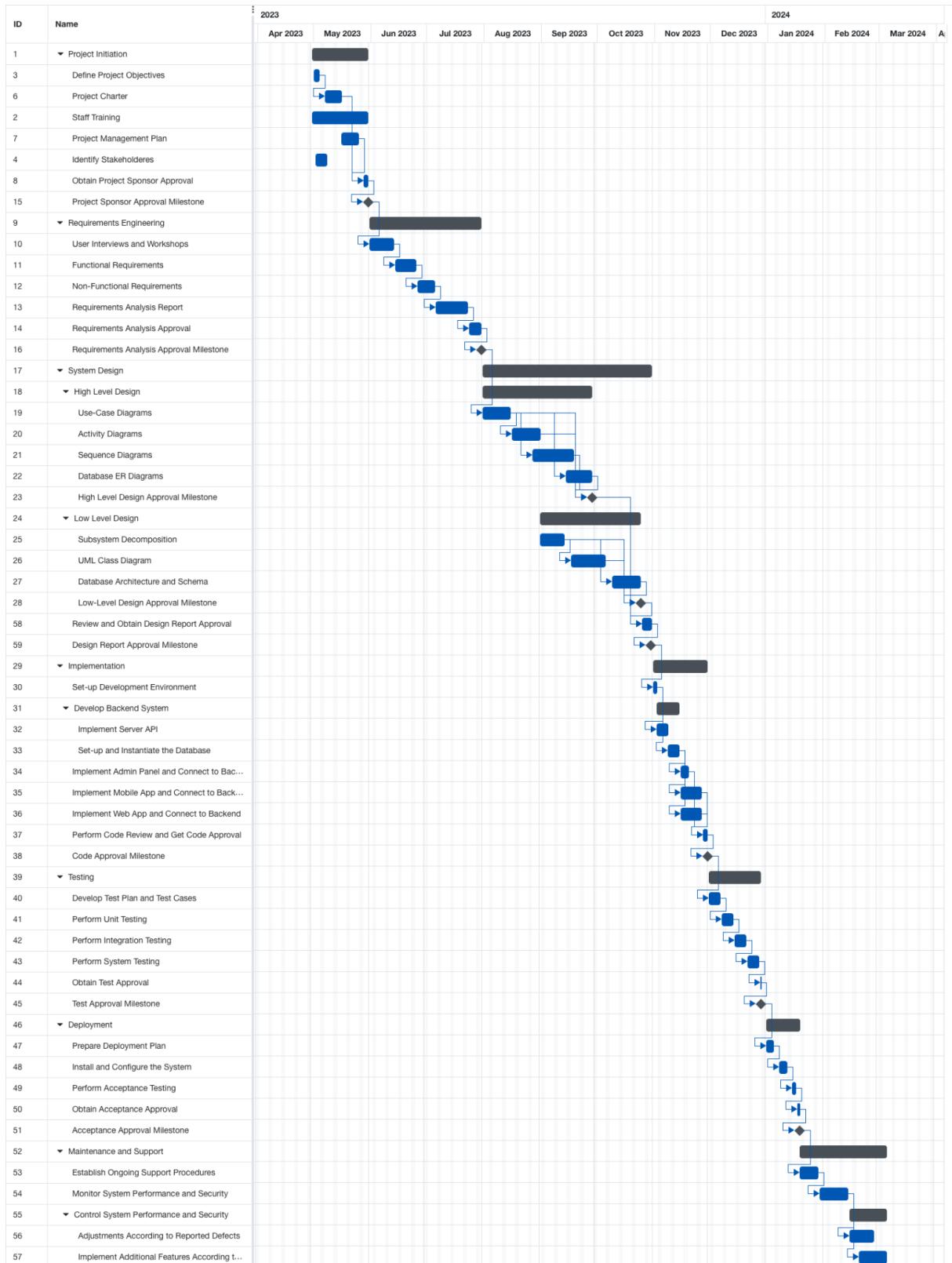


Figure 9: Whole Schedule Gantt Chart of ALIZE

Resource Allocation

The required resources for each major work activity in the work breakdown structure (WBS) is given together with the usecase description, number of resources, and required skill levels for the personnel that use the resources. Each resource item is represented by a separate item as a child of each work activity.

1.1 Project Initiation

1.1.1 Staff Training

- Training:
 - Description: Training personnels are needed for both Managerial Skills Training and Technical Skills Training. Training is planned to be online.
 - Number of Resources: 2 Personnel for Managerial Skills Training and 2 personnel for Technical Skills Training.
 - Required Skill Level: The trainers for Technical Skills Training must be Senior Software Engineers and the trainers for Managerial Skills Training must be Senior Project Managers.
- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 16 laptop equipment is provided for each staff.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 16 software resource is allocated for each staff.
 - Required Skill Level: The staffs that use the software need to be at least junior level.

1.1.2 Define Project Objectives and Scope

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 2 laptop equipments are provided for QA engineers and 3 laptop equipments are provided for Project Managers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.

- Number of Resources: 2 software resources are provided for QA engineers and 3 software resources are provided for Project Managers.
- Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 2 QA engineers and 3 project managers.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 2 QA engineers and 3 project managers.
 - Required Skill Level: There is no required skill level for this resource.

1.1.3 Identify Stakeholders

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 2 laptop equipments are provided for QA engineers and 3 laptop equipments are provided for Project Managers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as Zoom to complete stakeholder interviews and identification.
 - Number of Resources: 2 software resources are provided for QA engineers and 3 software resources are provided for Project Managers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 2 QA engineers and 3 project managers.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 2 QA engineers and 3 project managers.
 - Required Skill Level: There is no required skill level for this resource.

1.1.4 Prepare Project Charter

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 2 laptop equipments are provided for QA engineers and 3 laptop equipments are provided for Project Managers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 2 software resources are provided for QA engineers and 3 software resources are provided for Project Managers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 2 QA engineers and 3 project managers.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 2 QA engineers and 3 project managers.
 - Required Skill Level: There is no required skill level for this resource.
- Administrative and janitorial services:
 - Description: The resources of the templates for Project Charter and the resources for the janitorial personnel.
 - Number of Resources: 1 Project Charter Template and 1 janitorial personnel.
 - Required Skill Level: There is no required skill level for this resource.

1.1.5 Prepare Project Management Plan

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 2 laptop equipments are provided for QA engineers and 3 laptop equipments are provided for Project Managers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.

- Computer hardware and software:
 - ➔ Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - ➔ Number of Resources: 2 software resources are provided for QA engineers and 3 software resources are provided for Project Managers.
 - ➔ Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - ➔ Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - ➔ Number of Resources: Transportation resources are allocated for 2 QA engineers and 3 project managers.
 - ➔ Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - ➔ Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - ➔ Number of Resources: Facility resources are allocated for 2 QA engineers and 3 project managers.
 - ➔ Required Skill Level: There is no required skill level for this resource.
- Administrative and janitorial services:
 - ➔ Description: The resources of the templates for Project Management Plan and the resources for the janitorial personnel.
 - ➔ Number of Resources: 1 Project Management Plan Template and 1 janitorial personnel.
 - ➔ Required Skill Level: There is no required skill level for this resource.

1.1.6 Obtain Project Sponsor Approval

- Equipment:
 - ➔ Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - ➔ Number of Resources: 3 laptop equipments are provided for Project Managers.
 - ➔ Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Transportation:
 - ➔ Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - ➔ Number of Resources: Transportation resources are allocated for 3 project managers.
 - ➔ Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - ➔ Description: Coffee bar and restaurant of the office can be used with a discount by the staff.

- Number of Resources: Facility resources are allocated for 3 project managers.
- Required Skill Level: There is no required skill level for this resource.
- Administrative and janitorial services:
 - Description: Resources for the janitorial personnel are required for the maintenance of the meeting room.
 - Number of Resources: 1 janitorial personnel.
 - Required Skill Level: There is no required skill level for this resource.

1.2 Requirements Engineering

1.2.1 Conduct user interviews and workshops

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 2 laptop equipment is provided for QA engineers
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as Zoom to complete user interviews.
 - Number of Resources: 2 software resource is allocated for QA engineers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 2 QA engineers.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 2 QA engineers.
 - Required Skill Level: There is no required skill level for this resource.

1.2.2 Elicit Functional Requirements

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.

- Number of Resources: 2 laptop equipment is provided for QA engineers, 4 laptop equipment is provided for back-end engineers.
- Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 2 software resource is allocated for QA engineers and 4 software resource is allocated for back-end engineers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 2 QA engineers and 4 back-end engineers.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 2 QA engineers and 4 backend engineers.
 - Required Skill Level: There is no required skill level for this resource.

1.2.3 Elicit Non-Functional Requirements

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 2 laptop equipment is provided for QA engineers, 4 laptop equipment is provided for back-end engineers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 2 software resource is allocated for QA engineers and 4 software resource is allocated for back-end engineers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.

- Number of Resources: Transportation resources are allocated for 2 QA engineers and 4 back-end engineers.
- Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 2 QA engineers and 4 backend engineers.
 - Required Skill Level: There is no required skill level for this resource.

1.2.4 Prepare Requirements Analysis Report

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 2 laptop equipment is provided for QA engineers, 2 laptop equipment is provided for back-end engineers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 2 software resource is allocated for QA engineers and 2 software resource is allocated for back-end engineers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 2 QA engineers and 2 back-end engineers.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 2 QA engineers and 2 backend engineers.
 - Required Skill Level: There is no required skill level for this resource.
- Administrative and janitorial services:
 - Description: The resources of the templates for Requirement Analysis Report and the resources for the janitorial personnel.
 - Number of Resources: 1 Requirement Analysis Report Template and 1 janitorial personnel.
 - Required Skill Level: There is no required skill level for this resource.

1.2.5 Review and Obtain Requirements Analysis Approval

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 2 laptop equipments are provided for Project Managers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 2 project managers.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 2 project managers.
 - Required Skill Level: There is no required skill level for this resource.
- Administrative and janitorial services:
 - Description: Resources for the janitorial personnel are required for the maintenance of the meeting room.
 - Number of Resources: 1 janitorial personnel.
 - Required Skill Level: There is no required skill level for this resource.

1.3 System Design

1.3.1 Prepare High-Level Design Report

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 1 laptop equipment is provided for QA engineers, 1 laptop equipment is provided for mobile engineers, and 2 laptop equipment is provided for front-end engineers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.

- Number of Resources: 1 software resource is allocated for QA engineers, 1 software resource is allocated for mobile engineers, and 2 software resource is allocated for front-end engineers.
- Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 1 QA engineers, 1 mobile engineers, and 2 front-end engineers.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 1 QA engineers, 1 mobile engineers, and 2 front-end engineers.
 - Required Skill Level: There is no required skill level for this resource.
- Administrative and janitorial services:
 - Description: The resources of the templates for High-Level Design Report and the resources for the janitorial personnel.
 - Number of Resources: 1 High-Level Design Report Template and 1 janitorial personnel.
 - Required Skill Level: There is no required skill level for this resource.

1.3.2 Prepare Low-Level Design Report

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 1 laptop equipment is provided for QA engineers, 2 laptop equipment is provided for mobile engineers, and 2 laptop equipment is provided for front-end engineers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 1 software resource is allocated for QA engineers, 2 software resource is allocated for mobile engineers, and 2 software resource is allocated for front-end engineers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:

- Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
- Number of Resources: Transportation resources are allocated for 1 QA engineers, 2 mobile engineers, and 2 front-end engineers.
- Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 1 QA engineers, 2 mobile engineers, and 2 front-end engineers.
 - Required Skill Level: There is no required skill level for this resource.
- Administrative and janitorial services:
 - Description: The resources of the templates for Low-Level Design Report and the resources for the janitorial personnel.
 - Number of Resources: 1 Low-Level Design Report Template and 1 janitorial personnel.
 - Required Skill Level: There is no required skill level for this resource.

1.3.3 Review and Obtain Design Report Approval

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 2 laptop equipments are provided for Project Managers and 1 laptop equipment is provided for a QA engineer.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 2 project managers and 1 QA engineer.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 2 project managers and 1 QA engineer.
 - Required Skill Level: There is no required skill level for this resource.
- Administrative and janitorial services:
 - Description: Resources for the janitorial personnel are required for the maintenance of the meeting room.
 - Number of Resources: 1 janitorial personnel.
 - Required Skill Level: There is no required skill level for this resource.

1.4 Implementation

1.4.1 Set-Up Development Environment

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 1 laptop equipment is provided for back-end engineers, 1 laptop equipment is provided for a mobile engineer, 1 laptop equipment is provided for a front-end engineer, and 1 laptop equipment is provided for a project manager.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 1 software resource is allocated for a back-end engineer, 1 software resource is allocated for a mobile engineer, 1 software resource is allocated for a front-end engineer, and 1 software resource is allocated for a project manager.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 1 back-end engineer, 1 mobile engineer, 1 front-end engineer, and 1 project manager.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 1 back-end engineer, 1 mobile engineer, 1 front-end engineer, and 1 project manager.
 - Required Skill Level: There is no required skill level for this resource.
- Service Contract:
 - Description: Service contracts for external software services which includes MongoDB database service and external service for payment system security.
 - Number of Resources: 1 service contract for MongoDB database service and 1 service contract for payment system security.
 - Required Skill Level: Service contracts should be done by a senior level project manager.

1.4.2 Develop Back-End of the System

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 4 laptop equipments are provided for back-end engineers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 4 software resources are allocated for back-end engineers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 4 back-end engineers.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 4 back-end engineers.
 - Required Skill Level: There is no required skill level for this resource.

1.4.3 Implement the Admin Panel and Connect It to Back-End System

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 4 laptop equipments are provided for back-end engineers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.

- Number of Resources: 4 software resources are allocated for back-end engineers.
- Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 4 back-end engineers.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 4 back-end engineers.
 - Required Skill Level: There is no required skill level for this resource.

1.4.4 Implement the Responsive Mobile Application and Connect It to Back-End System

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 2 laptop equipments are provided for back-end engineers and 3 laptop equipments are provided for mobile engineers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 2 software resources are allocated for back-end engineers and 3 software resources are allocated for mobile engineers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 2 back-end engineers and 3 mobile engineers.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.

- Number of Resources: Facility resources are allocated for 2 back-end engineers and 3 mobile engineers.
- Required Skill Level: There is no required skill level for this resource.

1.4.5 Implement the Front-End of the Web Application and Connect It to Back-End System

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 2 laptop equipments are provided for back-end engineers and 4 laptop equipments are provided for front-end engineers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 2 software resources are allocated for back-end engineers and 4 software resources are allocated for front-end engineers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 2 back-end engineers and 4 front-end engineers.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 2 back-end engineers and 4 front-end engineers.
 - Required Skill Level: There is no required skill level for this resource.

1.4.6 Perform Code Review and Obtain Code Approval

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.

- Number of Resources: 1 laptop equipment is provided for back-end engineers, 1 laptop equipment is provided for a mobile engineer, 1 laptop equipment is provided for a front-end engineer, and 1 laptop equipment is provided for a project manager.
- Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 1 software resource is allocated for a back-end engineer, 1 software resource is allocated for a mobile engineer, 1 software resource is allocated for a front-end engineer, and 1 software resource is allocated for a project manager.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 1 back-end engineer, 1 mobile engineer, 1 front-end engineer, and 1 project manager.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 1 back-end engineer, 1 mobile engineer, 1 front-end engineer, and 1 project manager.
 - Required Skill Level: There is no required skill level for this resource.
- Administrative and janitorial services:
 - Description: Resources for the janitorial personnel are required for the maintenance of the meeting room.
 - Number of Resources: 1 janitorial personnel.
 - Required Skill Level: There is no required skill level for this resource.

1.5 Testing

1.5.1 Develop Test Plan and Test Cases

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 1 laptop equipment is provided for QA engineers, 1 laptop equipment is provided for mobile engineers, 1 laptop equipment

- is provided for front-end engineers, and 1 laptop equipment is provided for back-end engineers.
- Required Skill Level: The staffs that use the equipment need to be at least junior level.
 - Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 1 software resource is allocated for QA engineers, 1 software resource is allocated for mobile engineers, and 1 software resource is allocated for front-end engineer, and 1 software resource is allocated for back-end engineers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
 - Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 1 QA engineers, 1 mobile engineers, 1 front-end engineer, and 1 back-end engineer.
 - Required Skill Level: There is no required skill level for this resource.
 - Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 1 QA engineers, 1 mobile engineers, 1 front-end engineer, and 1 back-end engineer.
 - Required Skill Level: There is no required skill level for this resource.
 - Administrative and janitorial services:
 - Description: The resources of the templates for Test Plan Document and the resources for the janitorial personnel.
 - Number of Resources: 1 Test Plan Document Template and 1 janitorial personnel.
 - Required Skill Level: There is no required skill level for this resource.

1.5.2 Perform Unit Testing

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment. Also a mobile device equipment is provided for mobile developers to test the application.
 - Number of Resources: 1 laptop equipment and 1 mobile device equipment is provided for mobile engineers, 1 laptop equipment is provided for front-end engineers, and 1 laptop equipment is provided for back-end engineers.

- Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 1 software resource is allocated for mobile engineers, and 1 software resource is allocated for front-end engineer, and 1 software resource is allocated for back-end engineers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 1 mobile engineers, 1 front-end engineer, and 1 back-end engineer.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 1 mobile engineers, 1 front-end engineer, and 1 back-end engineer.
 - Required Skill Level: There is no required skill level for this resource.

1.5.3 Perform Integration Testing

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment. Also a mobile device equipment is provided for mobile developers to test the application.
 - Number of Resources: 1 laptop equipment and 1 mobile device equipment is provided for mobile engineers, 1 laptop equipment is provided for front-end engineers, and 1 laptop equipment is provided for back-end engineers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 1 software resource is allocated for mobile engineers, 1 software resource is allocated for front-end engineer, and 1 software resource is allocated for back-end engineers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.

- Transportation:
 - ➔ Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - ➔ Number of Resources: Transportation resources are allocated for 1 mobile engineers, 1 front-end engineer, and 1 back-end engineer.
 - ➔ Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - ➔ Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - ➔ Number of Resources: Facility resources are allocated for 1 mobile engineers, 1 front-end engineer, and 1 back-end engineer.
 - ➔ Required Skill Level: There is no required skill level for this resource.

1.5.4 Perform System Testing

- Equipment:
 - ➔ Description: For this work item laptop equipments are provided the staffs that require the equipment. Also a mobile device equipment is provided for mobile developers to test the application.
 - ➔ Number of Resources: 1 laptop equipment is provided for QA engineers, 1 laptop equipment and 1 mobile device equipment is provided for mobile engineers, 1 laptop equipment is provided for front-end engineers, and 1 laptop equipment is provided for back-end engineers.
 - ➔ Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - ➔ Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - ➔ Number of Resources: 1 software resource is allocated for QA engineers, 1 software resource is allocated for mobile engineers, and 1 software resource is allocated for front-end engineer, and 1 software resource is allocated for back-end engineers.
 - ➔ Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - ➔ Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - ➔ Number of Resources: Transportation resources are allocated for 1 QA engineer, 1 mobile engineers, 1 front-end engineer, and 1 back-end engineer.
 - ➔ Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - ➔ Description: Coffee bar and restaurant of the office can be used with a discount by the staff.

- Number of Resources: Facility resources are allocated for 1 QA engineer, 1 mobile engineers, 1 front-end engineer, and 1 back-end engineer.
- Required Skill Level: There is no required skill level for this resource.

1.5.5 Obtain Testing Approval

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 1 laptop equipment is provided for a QA engineer, and 1 laptop equipment is provided for a project manager.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 1 software resource is allocated for a QA engineer, and 1 software resource is allocated for a project manager.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 1 QA engineer, and 1 project manager.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 1 QA engineer, and 1 project manager.
 - Required Skill Level: There is no required skill level for this resource.
- Administrative and janitorial services:
 - Description: Resources for the janitorial personnel are required for the maintenance of the meeting room.
 - Number of Resources: 1 janitorial personnel.
 - Required Skill Level: There is no required skill level for this resource.

1.6 Deployment

1.6.1 Prepare Deployment Plan

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 1 laptop equipment is provided for mobile engineers, 1 laptop equipment is provided for front-end engineers, and 1 laptop equipment is provided for back-end engineers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 1 software resource is allocated for mobile engineers, and 1 software resource is allocated for front-end engineer, and 1 software resource is allocated for back-end engineers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 1 mobile engineers, 1 front-end engineer, and 1 back-end engineer.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 1 mobile engineers, 1 front-end engineer, and 1 back-end engineer.
 - Required Skill Level: There is no required skill level for this resource.
- Administrative and janitorial services:
 - Description: The resources of the templates for Deployment Plan and the resources for the janitorial personnel.
 - Number of Resources: 1 Deployment Plan Template and 1 janitorial personnel.
 - Required Skill Level: There is no required skill level for this resource.

1.6.2 Install and Configure the System

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 1 laptop equipment is provided for project manager, 1 laptop equipment is provided for mobile engineers, 1 laptop equipment is provided for front-end engineers, and 2 laptop equipment is provided for back-end engineers.

- Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 1 software resource is allocated for project manager, 1 software resource is allocated for mobile engineer, and 1 software resource is allocated for front-end engineer, and 2 software resource is allocated for back-end engineers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 1 project manager, 1 mobile engineers, 1 front-end engineer, and 2 back-end engineer.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 1 project manager, 1 mobile engineers, 1 front-end engineer, and 2 back-end engineer.
 - Required Skill Level: There is no required skill level for this resource.
- Service Contract:
 - Description: Service contracts for production server and production database is applied.
 - Number of Resources: 3 service contracts for production server and 2 service contracts for production database.
 - Required Skill Level: Service contracts should be done by a senior level project manager.

1.6.3 Perform Acceptance Testing

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 3 laptop equipment is provided for project managers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:

- Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
- Number of Resources: 3 software resource is allocated for project managers.
- Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 3 project managers.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 3 project managers.
 - Required Skill Level: There is no required skill level for this resource.
- Administrative and janitorial services:
 - Description: Resources for the janitorial personnel are required for the maintenance of the meeting room.
 - Number of Resources: 1 janitorial personnel.
 - Required Skill Level: There is no required skill level for this resource.

1.6.4 Obtain Acceptance Approval

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 2 laptop equipment is provided for project managers.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 2 software resource is allocated for project managers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.

- Number of Resources: Transportation resources are allocated for 2 project managers.
- Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 2 project managers.
 - Required Skill Level: There is no required skill level for this resource.
- Administrative and janitorial services:
 - Description: Resources for the janitorial personnel are required for the maintenance of the meeting room.
 - Number of Resources: 1 janitorial personnel.
 - Required Skill Level: There is no required skill level for this resource.

1.7 Maintenance and Support

1.7.1 Establish Ongoing Support Procedures

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 2 laptop equipment is provided for QA engineers and 1 laptop equipment is provided for project manager.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 2 software resource is allocated for QA engineers, and 1 software resource is allocated for project manager.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 2 QA engineers and 1 project manager.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 2 QA engineers and 1 project manager.

- Required Skill Level: There is no required skill level for this resource.
- Administrative and janitorial services:
 - Description: The resources of the templates for ongoing support procedures and the resources for the janitorial personnel.
 - Number of Resources: 1 ongoing support procedures Template and 1 janitorial personnel.
 - Required Skill Level: There is no required skill level for this resource.

1.7.2 Monitor System Performance and Security

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.
 - Number of Resources: 2 laptop equipment is provided for QA engineer and 1 laptop equipment is provided for project manager.
 - Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 2 software resource is allocated for QA engineers, and 1 software resource is allocated for project manager.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 2 QA engineers and 1 project manager.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 2 QA engineers and 1 project manager.
 - Required Skill Level: There is no required skill level for this resource.

1.7.3 Control System Performance and Security

- Equipment:
 - Description: For this work item laptop equipments are provided the staffs that require the equipment.

- Number of Resources: 1 laptop equipment is provided for QA engineers, 2 laptop equipment is provided for mobile engineers, 2 laptop equipment is provided for front-end engineers and 2 laptop equipment is provided for back-end engineers.
- Required Skill Level: The staffs that use the equipment need to be at least junior level.
- Computer hardware and software:
 - Description: Necessary software for the staff is provided such as preferred IDE's and Text Editors as software extra hardware is not planned unless there is a need for it.
 - Number of Resources: 1 software resource is allocated for QA engineers, 2 software resource is allocated for mobile engineers, 2 software resource is allocated for front-end engineers, and 2 software resource is allocated for back-end engineers.
 - Required Skill Level: The staffs that use the software need to be at least junior level.
- Transportation:
 - Description: Taxi bills are created for the organization and paid by the organization and the taxi transportation is provided for the staff.
 - Number of Resources: Transportation resources are allocated for 1 QA engineers, 2 mobile engineers, 2 front-end engineers, and 2 back-end engineers.
 - Required Skill Level: There is no required skill level for this resource.
- Facilities:
 - Description: Coffee bar and restaurant of the office can be used with a discount by the staff.
 - Number of Resources: Facility resources are allocated for 1 QA engineers, 2 mobile engineers, 2 front-end engineers, and 2 back-end engineers.
 - Required Skill Level: There is no required skill level for this resource.

To summarize the resource allocation of the project and to be able to see the big picture, a tabular form of the required resources with respect to each separate major work activity is provided below. Each type of resource in each work activity is displayed in a separate row. Each row in the table includes entries for Parent Work Activity, Major Child Work Activity, Resource Name, Number of Resources Needed, and Required Skill Level.

| Parent Work Activity | Major Child Work Activity | Resource Name | Number of Resource | Required Skill Level |
|----------------------|---------------------------|---------------|--------------------|----------------------|
| | | | | |

| | | | Needed | |
|--------------------|-------------------------------------|--------------------------------|--------|--------|
| Project Initiation | Staff Training | Training | 4 | Senior |
| Project Initiation | Staff Training | Equipment | 16 | Junior |
| Project Initiation | Staff Training | Computer Hardware and Software | 16 | Junior |
| Project Initiation | Define Project Objectives and Scope | Equipment | 5 | Junior |
| Project Initiation | Define Project Objectives and Scope | Computer Hardware and Software | 5 | Junior |
| Project Initiation | Define Project Objectives and Scope | Transportation | 5 | None |
| Project Initiation | Define Project Objectives and Scope | Facilities | 5 | None |
| Project Initiation | Identify Stakeholders | Equipment | 5 | Junior |
| Project Initiation | Identify Stakeholders | Computer Hardware and Software | 5 | Junior |
| Project Initiation | Identify Stakeholders | Transportation | 5 | None |
| Project Initiation | Identify Stakeholders | Facilities | 5 | None |
| Project Initiation | Prepare Project Charter | Equipment | 5 | Junior |

| | | | | |
|--------------------|---------------------------------|--|---|--------|
| Project Initiation | Prepare Project Charter | Computer Hardware and Software | 5 | Junior |
| Project Initiation | Prepare Project Charter | Transportation | 5 | None |
| Project Initiation | Prepare Project Charter | Facilities | 5 | None |
| Project Initiation | Prepare Project Charter | Administrative and Janitorial Services | 2 | None |
| Project Initiation | Prepare Project Management Plan | Equipment | 5 | Junior |
| Project Initiation | Prepare Project Management Plan | Computer Hardware and Software | 5 | Junior |
| Project Initiation | Prepare Project Management Plan | Transportation | 5 | None |
| Project Initiation | Prepare Project Management Plan | Facilities | 5 | None |
| Project Initiation | Prepare Project Management Plan | Administrative and Janitorial Services | 2 | None |
| Project Initiation | Obtain Project Sponsor Approval | Equipment | 3 | Junior |
| Project Initiation | Obtain Project Sponsor Approval | Transportation | 3 | None |
| Project Initiation | Obtain Project Sponsor Approval | Facilities | 3 | None |
| Project Initiation | Obtain Project Sponsor Approval | Administrative and Janitorial | 1 | None |

| | | Services | | |
|--------------------------|---------------------------------------|--------------------------------|---|--------|
| Requirements Engineering | Conduct interviews user and workshops | Equipment | 2 | Junior |
| Requirements Engineering | Conduct interviews user and workshops | Computer Hardware and Software | 2 | Junior |
| Requirements Engineering | Conduct interviews user and workshops | Transportation | 2 | None |
| Requirements Engineering | Conduct interviews user and workshops | Facilities | 2 | None |
| Requirements Engineering | Elicit Functional Requirements | Equipment | 6 | Junior |
| Requirements Engineering | Elicit Functional Requirements | Computer Hardware and Software | 6 | Junior |
| Requirements Engineering | Elicit Functional Requirements | Transportation | 6 | None |
| Requirements Engineering | Elicit Functional Requirements | Facilities | 6 | None |
| Requirements Engineering | Elicit Non-Functional Requirements | Equipment | 6 | Junior |
| Requirements Engineering | Elicit Non-Functional Requirements | Computer Hardware and Software | 6 | Junior |

| | | | | |
|--------------------------|--|--|---|--------|
| Requirements Engineering | Elicit Non-Functional Requirements | Transportation | 6 | None |
| Requirements Engineering | Elicit Non-Functional Requirements | Facilities | 6 | None |
| Requirements Engineering | Prepare Requirements Analysis Report | Equipment | 4 | Junior |
| Requirements Engineering | Prepare Requirements Analysis Report | Computer Hardware and Software | 4 | Junior |
| Requirements Engineering | Prepare Requirements Analysis Report | Transportation | 4 | None |
| Requirements Engineering | Prepare Requirements Analysis Report | Facilities | 4 | None |
| Requirements Engineering | Prepare Requirements Analysis Report | Administrative and Janitorial Services | 2 | None |
| Requirements Engineering | Review and Obtain Requirements Analysis Approval | Equipment | 2 | Junior |
| Requirements Engineering | Review and Obtain Requirements Analysis Approval | Transportation | 2 | None |
| Requirements Engineering | Review and Obtain Requirements Analysis Approval | Facilities | 2 | None |

| | | | | |
|--------------------------|--|--|---|--------|
| Requirements Engineering | Review and Obtain Requirements Analysis Approval | Administrative and Janitorial Services | 1 | None |
| System Design | Prepare High-Level Design Report | Equipment | 4 | Junior |
| System Design | Prepare High-Level Design Report | Computer Hardware and Software | 4 | Junior |
| System Design | Prepare High-Level Design Report | Transportation | 4 | None |
| System Design | Prepare High-Level Design Report | Facilities | 4 | None |
| System Design | Prepare High-Level Design Report | Administrative and Janitorial Services | 2 | None |
| System Design | Prepare Low-Level Design Report | Equipment | 5 | Junior |
| System Design | Prepare Low-Level Design Report | Computer Hardware and Software | 5 | Junior |
| System Design | Prepare Low-Level Design Report | Transportation | 5 | None |
| System Design | Prepare Low-Level Design Report | Facilities | 5 | None |
| System Design | Prepare Low-Level Design Report | Administrative and Janitorial Services | 2 | None |
| System Design | Review and Obtain Design Report Approval | Equipment | 3 | Junior |

| | | | | |
|----------------|--|--|---|--------|
| System Design | Review and Obtain Design Report Approval | Transportation | 3 | None |
| System Design | Review and Obtain Design Report Approval | Facilities | 3 | None |
| System Design | Review and Obtain Design Report Approval | Administrative and Janitorial Services | 1 | None |
| Implementation | Set-Up Development Environment | Equipment | 4 | Junior |
| Implementation | Set-Up Development Environment | Computer Hardware and Software | 4 | Junior |
| Implementation | Set-Up Development Environment | Transportation | 4 | None |
| Implementation | Set-Up Development Environment | Facilities | 4 | None |
| Implementation | Set-Up Development Environment | Service Contract | 2 | Senior |
| Implementation | Develop Back-End of the System | Equipment | 4 | Junior |
| Implementation | Develop Back-End of the System | Computer Hardware and Software | 4 | Junior |
| Implementation | Develop Back-End of the System | Transportation | 4 | None |
| Implementation | Develop Back-End of the System | Facilities | 4 | None |

| | | | | |
|----------------|---|--------------------------------|---|--------|
| Implementation | Implement the Admin Panel and Connect It to Back-End System | Equipment | 4 | Junior |
| Implementation | Implement the Admin Panel and Connect It to Back-End System | Computer Hardware and Software | 4 | Junior |
| Implementation | Implement the Admin Panel and Connect It to Back-End System | Transportation | 4 | None |
| Implementation | Implement the Admin Panel and Connect It to Back-End System | Facilities | 4 | None |
| Implementation | Implement the Responsive Mobile Application and Connect It to Back-End System | Equipment | 5 | Junior |
| Implementation | Implement the Responsive Mobile Application and Connect It to Back-End System | Computer Hardware and Software | 5 | Junior |
| Implementation | Implement the Responsive Mobile Application and Connect It to Back-End System | Transportation | 5 | None |
| Implementation | Implement the Responsive Mobile Application and Connect It to Back-End System | Facilities | 5 | None |

| | | | | |
|----------------|--|--------------------------------|---|--------|
| | Connect It to Back-End System | | | |
| Implementation | Implement the Front-End of the Web Application and Connect It to Back-End System | Equipment | 6 | Junior |
| Implementation | Implement the Front-End of the Web Application and Connect It to Back-End System | Computer Hardware and Software | 6 | Junior |
| Implementation | Implement the Front-End of the Web Application and Connect It to Back-End System | Transportation | 6 | None |
| Implementation | Implement the Front-End of the Web Application and Connect It to Back-End System | Facilities | 6 | None |
| Implementation | Perform Code Review and Obtain Code Approval | Equipment | 4 | Junior |
| Implementation | Perform Code Review and Obtain Code Approval | Computer Hardware and Software | 4 | Junior |
| Implementation | Perform Code Review and Obtain Code Approval | Transportation | 4 | None |

| | | | | |
|----------------|--|--|---|--------|
| Implementation | Perform Code Review and Obtain Code Approval | Facilities | 4 | None |
| Implementation | Perform Code Review and Obtain Code Approval | Administrative and Janitorial Services | 1 | None |
| Testing | Develop Test Plan and Test Cases | Equipment | 4 | Junior |
| Testing | Develop Test Plan and Test Cases | Computer Hardware and Software | 4 | Junior |
| Testing | Develop Test Plan and Test Cases | Transportation | 4 | None |
| Testing | Develop Test Plan and Test Cases | Facilities | 4 | None |
| Testing | Develop Test Plan and Test Cases | Administrative and Janitorial Services | 2 | None |
| Testing | Perform Unit Testing | Equipment | 4 | Junior |
| Testing | Perform Unit Testing | Computer Hardware and Software | 3 | Junior |
| Testing | Perform Unit Testing | Transportation | 3 | None |
| Testing | Perform Unit Testing | Facilities | 3 | None |
| Testing | Perform Integration Testing | Equipment | 4 | Junior |
| Testing | Perform Integration Testing | Computer Hardware and Software | 3 | Junior |

| | | | | |
|------------|-----------------------------|--|---|--------|
| Testing | Perform Integration Testing | Transportation | 3 | None |
| Testing | Perform Integration Testing | Facilities | 3 | None |
| Testing | Perform System Testing | Equipment | 5 | Junior |
| Testing | Perform System Testing | Computer Hardware and Software | 4 | Junior |
| Testing | Perform System Testing | Transportation | 4 | None |
| Testing | Perform System Testing | Facilities | 4 | None |
| Testing | Obtain Testing Approval | Equipment | 2 | Junior |
| Testing | Obtain Testing Approval | Computer Hardware and Software | 2 | Junior |
| Testing | Obtain Testing Approval | Transportation | 2 | None |
| Testing | Obtain Testing Approval | Facilities | 2 | None |
| Testing | Obtain Testing Approval | Administrative and Janitorial Services | 1 | None |
| Deployment | Prepare Deployment Plan | Equipment | 3 | Junior |
| Deployment | Prepare Deployment Plan | Computer Hardware and Software | 3 | Junior |

| | | | | |
|------------|----------------------------------|--|---|--------|
| Deployment | Prepare Deployment Plan | Transportation | 3 | None |
| Deployment | Prepare Deployment Plan | Facilities | 3 | None |
| Deployment | Prepare Deployment Plan | Administrative and Janitorial Services | 2 | None |
| Deployment | Install and Configure the System | Equipment | 5 | Junior |
| Deployment | Install and Configure the System | Computer Hardware and Software | 5 | Junior |
| Deployment | Install and Configure the System | Transportation | 5 | None |
| Deployment | Install and Configure the System | Facilities | 5 | None |
| Deployment | Install and Configure the System | Service Contract | 5 | Senior |
| Deployment | Perform Acceptance Testing | Equipment | 3 | Junior |
| Deployment | Perform Acceptance Testing | Computer Hardware and Software | 3 | Junior |
| Deployment | Perform Acceptance Testing | Transportation | 3 | None |
| Deployment | Perform Acceptance Testing | Facilities | 3 | None |
| Deployment | Perform Acceptance Testing | Administrative and Janitorial Services | 1 | None |

| | | | | |
|-------------------------|---|--|---|--------|
| Deployment | Obtain Acceptance Approval | Equipment | 2 | Junior |
| Deployment | Obtain Acceptance Approval | Computer Hardware and Software | 2 | Junior |
| Deployment | Obtain Acceptance Approval | Transportation | 2 | None |
| Deployment | Obtain Acceptance Approval | Facilities | 2 | None |
| Deployment | Obtain Acceptance Approval | Administrative and Janitorial Services | 1 | None |
| Maintenance and Support | Establish Ongoing Support Procedures | Equipment | 3 | Junior |
| Maintenance and Support | Establish Ongoing Support Procedures | Computer Hardware and Software | 3 | Junior |
| Maintenance and Support | Establish Ongoing Support Procedures | Transportation | 3 | None |
| Maintenance and Support | Establish Ongoing Support Procedures | Facilities | 3 | None |
| Maintenance and Support | Establish Ongoing Support Procedures | Administrative and Janitorial Services | 2 | None |
| Maintenance and Support | Monitor System Performance and Security | Equipment | 3 | Junior |
| Maintenance and Support | Monitor System Performance and Security | Computer Hardware and Software | 3 | Junior |

| | | | | |
|-------------------------|---|--------------------------------|---|--------|
| Maintenance and Support | Monitor System Performance and Security | Transportation | 3 | None |
| Maintenance and Support | Monitor System Performance and Security | Facilities | 3 | None |
| Maintenance and Support | Control System Performance and Security | Equipment | 7 | Junior |
| Maintenance and Support | Control System Performance and Security | Computer Hardware and Software | 7 | Junior |
| Maintenance and Support | Control System Performance and Security | Transportation | 7 | None |
| Maintenance and Support | Control System Performance and Security | Facilities | 7 | None |

Table 5: Resource Allocation Information

Budget Allocation

The activity budget information is represented for each of the major work activities in the Work Breakdown Structure (WBS) of ALIZE. The budget information is prepared and displayed in tabular form in detail. Each type of resource in each work activity is displayed in a separate row. Each row in the table includes entries for Parent Work Activity, Major Child Work Activity, Resource of the Cost, and Cost. The source of the cost includes both the staff that works on the specified activity, and the cost for the factors of training, equipment, computer hardware and software, service contracts, transportation, facilities, and administrative and janitorial services.

| Parent Work Activity | Major Child Work Activity | Resource of the Cost | Cost |
|----------------------|---------------------------|----------------------|-------|
| Project Initiation | Staff Training | Training | 20000 |

| | | | |
|--------------------|-------------------------------------|--------------------------------|----------|
| | | | TL |
| Project Initiation | Staff Training | Equipment | 2000 TL |
| Project Initiation | Staff Training | Computer Hardware and Software | 1000 TL |
| Project Initiation | Define Project Objectives and Scope | Staff Payment | 21000 TL |
| Project Initiation | Define Project Objectives and Scope | Equipment | 625 TL |
| Project Initiation | Define Project Objectives and Scope | Computer Hardware and Software | 313 TL |
| Project Initiation | Define Project Objectives and Scope | Transportation | 250 TL |
| Project Initiation | Define Project Objectives and Scope | Facilities | 313 TL |
| Project Initiation | Identify Stakeholders | Staff Payment | 21000 TL |
| Project Initiation | Identify Stakeholders | Equipment | 625 TL |
| Project Initiation | Identify Stakeholders | Computer Hardware and Software | 313 TL |
| Project Initiation | Identify Stakeholders | Transportation | 250 TL |
| Project Initiation | Identify Stakeholders | Facilities | 313 TL |
| Project Initiation | Prepare Project Charter | Staff Payment | 21000 TL |
| Project Initiation | Prepare Project Charter | Equipment | 625 TL |

| | | | |
|--------------------|---------------------------------|--|----------|
| Project Initiation | Prepare Project Charter | Computer Hardware and Software | 313 TL |
| Project Initiation | Prepare Project Charter | Transportation | 250 TL |
| Project Initiation | Prepare Project Charter | Facilities | 313 TL |
| Project Initiation | Prepare Project Charter | Administrative and Janitorial Services | 200 TL |
| Project Initiation | Prepare Project Management Plan | Staff Payment | 21000 TL |
| Project Initiation | Prepare Project Management Plan | Equipment | 625 TL |
| Project Initiation | Prepare Project Management Plan | Computer Hardware and Software | 313 TL |
| Project Initiation | Prepare Project Management Plan | Transportation | 250 TL |
| Project Initiation | Prepare Project Management Plan | Facilities | 313 TL |
| Project Initiation | Prepare Project Management Plan | Administrative and Janitorial Services | 200 TL |
| Project Initiation | Obtain Project Sponsor Approval | Staff Payment | 21000 TL |
| Project Initiation | Obtain Project Sponsor Approval | Equipment | 375 TL |
| Project Initiation | Obtain Project Sponsor Approval | Transportation | 188 TL |
| Project Initiation | Obtain Project Sponsor Approval | Facilities | 150 TL |

| | | | |
|--------------------------|---------------------------------------|--|----------|
| Project Initiation | Obtain Project Sponsor Approval | Administrative and Janitorial Services | 100 TL |
| Requirements Engineering | Conduct user interviews and workshops | Staff Payment | 32200 TL |
| Requirements Engineering | Conduct user interviews and workshops | Equipment | 250 TL |
| Requirements Engineering | Conduct user interviews and workshops | Computer Hardware and Software | 125 TL |
| Requirements Engineering | Conduct user interviews and workshops | Transportation | 100 TL |
| Requirements Engineering | Conduct user interviews and workshops | Facilities | 125 TL |
| Requirements Engineering | Elicit Functional Requirements | Staff Payment | 32200 TL |
| Requirements Engineering | Elicit Functional Requirements | Equipment | 750 TL |
| Requirements Engineering | Elicit Functional Requirements | Computer Hardware and Software | 375 TL |
| Requirements Engineering | Elicit Functional Requirements | Transportation | 300 TL |
| Requirements Engineering | Elicit Functional Requirements | Facilities | 375 TL |
| Requirements Engineering | Elicit Non-Functional Requirements | Staff Payment | 32200 TL |
| Requirements Engineering | Elicit Non-Functional Requirements | Equipment | 750 TL |

| | | | |
|--------------------------|--|--|----------|
| Requirements Engineering | Elicit Requirements Non-Functional | Computer Hardware and Software | 375 TL |
| Requirements Engineering | Elicit Requirements Non-Functional | Transportation | 300 TL |
| Requirements Engineering | Elicit Requirements Non-Functional | Facilities | 375 TL |
| Requirements Engineering | Prepare Requirements Analysis Report | Staff Payment | 32200 TL |
| Requirements Engineering | Prepare Requirements Analysis Report | Equipment | 500 TL |
| Requirements Engineering | Prepare Requirements Analysis Report | Computer Hardware and Software | 250 TL |
| Requirements Engineering | Prepare Requirements Analysis Report | Transportation | 200 TL |
| Requirements Engineering | Prepare Requirements Analysis Report | Facilities | 250 TL |
| Requirements Engineering | Prepare Requirements Analysis Report | Administrative and Janitorial Services | 200 TL |
| Requirements Engineering | Review and Obtain Requirements Analysis Approval | Staff Payment | 32200 TL |
| Requirements Engineering | Review and Obtain Requirements Analysis Approval | Equipment | 250 TL |
| Requirements Engineering | Review and Obtain Requirements Analysis Approval | Transportation | 100 TL |
| Requirements Engineering | Review and Obtain Requirements Analysis Approval | Facilities | 125 TL |

| | | | |
|--------------------------|--|--|----------|
| Requirements Engineering | Review and Obtain Requirements Analysis Approval | Administrative and Janitorial Services | 100 TL |
| System Design | Prepare High-Level Design Report | Staff Payment | 66333 TL |
| System Design | Prepare High-Level Design Report | Equipment | 500 TL |
| System Design | Prepare High-Level Design Report | Computer Hardware and Software | 250 TL |
| System Design | Prepare High-Level Design Report | Transportation | 200 TL |
| System Design | Prepare High-Level Design Report | Facilities | 250 TL |
| System Design | Prepare High-Level Design Report | Administrative and Janitorial Services | 200 TL |
| System Design | Prepare Low-Level Design Report | Staff Payment | 66333 TL |
| System Design | Prepare Low-Level Design Report | Equipment | 625 TL |
| System Design | Prepare Low-Level Design Report | Computer Hardware and Software | 313 TL |
| System Design | Prepare Low-Level Design Report | Transportation | 250 TL |
| System Design | Prepare Low-Level Design Report | Facilities | 313 TL |
| System Design | Prepare Low-Level Design Report | Administrative and Janitorial | 200 TL |

| | | Services | |
|----------------|--|--|----------|
| System Design | Review and Obtain Design Report Approval | Staff Payment | 66333 TL |
| System Design | Review and Obtain Design Report Approval | Equipment | 375 TL |
| System Design | Review and Obtain Design Report Approval | Transportation | 188 TL |
| System Design | Review and Obtain Design Report Approval | Facilities | 150 TL |
| System Design | Review and Obtain Design Report Approval | Administrative and Janitorial Services | 100 TL |
| Implementation | Set-Up Development Environment | Staff Payment | 37500 TL |
| Implementation | Set-Up Development Environment | Equipment | 500 TL |
| Implementation | Set-Up Development Environment | Computer Hardware and Software | 250 TL |
| Implementation | Set-Up Development Environment | Transportation | 200 TL |
| Implementation | Set-Up Development Environment | Facilities | 250 TL |
| Implementation | Set-Up Development Environment | Service Contract | 25000 TL |
| Implementation | Develop Back-End of the System | Staff Payment | 37500 TL |
| Implementation | Develop Back-End of the System | Equipment | 500 TL |

| | | | |
|----------------|---|--------------------------------|----------|
| Implementation | Develop Back-End of the System | Computer Hardware and Software | 250 TL |
| Implementation | Develop Back-End of the System | Transportation | 200 TL |
| Implementation | Develop Back-End of the System | Facilities | 250 TL |
| Implementation | Implement the Admin Panel and Connect It to Back-End System | Staff Payment | 37500 TL |
| Implementation | Implement the Admin Panel and Connect It to Back-End System | Equipment | 500 TL |
| Implementation | Implement the Admin Panel and Connect It to Back-End System | Computer Hardware and Software | 250 TL |
| Implementation | Implement the Admin Panel and Connect It to Back-End System | Transportation | 200 TL |
| Implementation | Implement the Admin Panel and Connect It to Back-End System | Facilities | 250 TL |
| Implementation | Implement the Responsive Mobile Application and Connect It to Back-End System | Staff Payment | 37500 TL |
| Implementation | Implement the Responsive Mobile Application and Connect It to Back-End System | Equipment | 625 TL |
| Implementation | Implement the Responsive Mobile Application and Connect It to Back-End System | Computer Hardware and Software | 313 TL |
| Implementation | Implement the Responsive Mobile Application and Connect It to Back-End System | Transportation | 250 TL |

| | | | |
|----------------|--|--------------------------------|----------|
| Implementation | Implement the Responsive Mobile Application and Connect It to Back-End System | Facilities | 313 TL |
| Implementation | Implement the Front-End of the Web Application and Connect It to Back-End System | Staff Payment | 37500 TL |
| Implementation | Implement the Front-End of the Web Application and Connect It to Back-End System | Equipment | 750 TL |
| Implementation | Implement the Front-End of the Web Application and Connect It to Back-End System | Computer Hardware and Software | 375 TL |
| Implementation | Implement the Front-End of the Web Application and Connect It to Back-End System | Transportation | 300 TL |
| Implementation | Implement the Front-End of the Web Application and Connect It to Back-End System | Facilities | 375 TL |
| Implementation | Perform Code Review and Obtain Code Approval | Staff Payment | 37500 TL |
| Implementation | Perform Code Review and Obtain Code Approval | Equipment | 500 TL |
| Implementation | Perform Code Review and Obtain Code Approval | Computer Hardware and Software | 250 TL |
| Implementation | Perform Code Review and Obtain Code Approval | Transportation | 200 TL |
| Implementation | Perform Code Review and Obtain Code Approval | Facilities | 250 TL |

| | | | |
|----------------|--|--|----------|
| Implementation | Perform Code Review and Obtain Code Approval | Administrative and Janitorial Services | 100 TL |
| Testing | Develop Test Plan and Test Cases | Staff Payment | 51000 TL |
| Testing | Develop Test Plan and Test Cases | Equipment | 500 TL |
| Testing | Develop Test Plan and Test Cases | Computer Hardware and Software | 250 TL |
| Testing | Develop Test Plan and Test Cases | Transportation | 200 TL |
| Testing | Develop Test Plan and Test Cases | Facilities | 250 TL |
| Testing | Develop Test Plan and Test Cases | Administrative and Janitorial Services | 200 TL |
| Testing | Perform Unit Testing | Staff Payment | 51000 TL |
| Testing | Perform Unit Testing | Equipment | 500 TL |
| Testing | Perform Unit Testing | Computer Hardware and Software | 188 TL |
| Testing | Perform Unit Testing | Transportation | 150 TL |
| Testing | Perform Unit Testing | Facilities | 188 TL |
| Testing | Perform Integration Testing | Staff Payment | 51000 TL |
| Testing | Perform Integration Testing | Equipment | 500 TL |
| Testing | Perform Integration Testing | Computer Hardware and Software | 188 TL |

| | | | |
|------------|-----------------------------|--|-------------|
| Testing | Perform Integration Testing | Transportation | 150 TL |
| Testing | Perform Integration Testing | Facilities | 188 TL |
| Testing | Perform System Testing | Staff Payment | 51000 TL |
| Testing | Perform System Testing | Equipment | 625 TL |
| Testing | Perform System Testing | Computer Hardware and Software | 250 TL |
| Testing | Perform System Testing | Transportation | 200 TL |
| Testing | Perform System Testing | Facilities | 250 TL |
| Testing | Obtain Testing Approval | Staff Payment | 51000 TL |
| Testing | Obtain Testing Approval | Equipment | 250 TL |
| Testing | Obtain Testing Approval | Computer Hardware and Software | 125 TL |
| Testing | Obtain Testing Approval | Transportation | 100 TL |
| Testing | Obtain Testing Approval | Facilities | 125 TL |
| Testing | Obtain Testing Approval | Administrative and Janitorial Services | 100 TL |
| Deployment | Prepare Deployment Plan | Staff Payment | 56250 TL |
| Deployment | Prepare Deployment Plan | Equipment | 375 TL |

| | | | |
|------------|----------------------------------|--|----------|
| Deployment | Prepare Deployment Plan | Computer Hardware and Software | 188 TL |
| Deployment | Prepare Deployment Plan | Transportation | 180 TL |
| Deployment | Prepare Deployment Plan | Facilities | 150 TL |
| Deployment | Prepare Deployment Plan | Administrative and Janitorial Services | 200 TL |
| Deployment | Install and Configure the System | Staff Payment | 56250 TL |
| Deployment | Install and Configure the System | Equipment | 625 TL |
| Deployment | Install and Configure the System | Computer Hardware and Software | 313 TL |
| Deployment | Install and Configure the System | Transportation | 250 TL |
| Deployment | Install and Configure the System | Facilities | 313 TL |
| Deployment | Install and Configure the System | Service Contract | 55000 TL |
| Deployment | Perform Acceptance Testing | Staff Payment | 56250 TL |
| Deployment | Perform Acceptance Testing | Equipment | 375 TL |
| Deployment | Perform Acceptance Testing | Computer Hardware and Software | 188 TL |
| Deployment | Perform Acceptance Testing | Transportation | 180 TL |
| Deployment | Perform Acceptance Testing | Facilities | 150 TL |

| | | | |
|-------------------------|--------------------------------------|--|----------|
| Deployment | Perform Acceptance Testing | Administrative and Janitorial Services | 100 TL |
| Deployment | Obtain Acceptance Approval | Staff Payment | 56250 TL |
| Deployment | Obtain Acceptance Approval | Equipment | 250 TL |
| Deployment | Obtain Acceptance Approval | Computer Hardware and Software | 125 TL |
| Deployment | Obtain Acceptance Approval | Transportation | 100 TL |
| Deployment | Obtain Acceptance Approval | Facilities | 125 TL |
| Deployment | Obtain Acceptance Approval | Administrative and Janitorial Services | 100 TL |
| Maintenance and Support | Establish Ongoing Support Procedures | Staff Payment | 85000 TL |
| Maintenance and Support | Establish Ongoing Support Procedures | Equipment | 375 TL |
| Maintenance and Support | Establish Ongoing Support Procedures | Computer Hardware and Software | 188 TL |
| Maintenance and Support | Establish Ongoing Support Procedures | Transportation | 180 TL |
| Maintenance and Support | Establish Ongoing Support Procedures | Facilities | 150 TL |
| Maintenance and Support | Establish Ongoing Support Procedures | Administrative and Janitorial Services | 200 TL |

| | | | |
|-------------------------|---|--------------------------------|----------|
| Maintenance and Support | Monitor System Performance and Security | Staff Payment | 85000 TL |
| Maintenance and Support | Monitor System Performance and Security | Equipment | 375 TL |
| Maintenance and Support | Monitor System Performance and Security | Computer Hardware and Software | 188 TL |
| Maintenance and Support | Monitor System Performance and Security | Transportation | 180 TL |
| Maintenance and Support | Monitor System Performance and Security | Facilities | 150 TL |
| Maintenance and Support | Control System Performance and Security | Staff Payment | 85000 TL |
| Maintenance and Support | Control System Performance and Security | Equipment | 875 TL |
| Maintenance and Support | Control System Performance and Security | Computer Hardware and Software | 438 TL |
| Maintenance and Support | Control System Performance and Security | Transportation | 350 TL |
| Maintenance and Support | Control System Performance and Security | Facilities | 438 TL |

Table 6: Budget Allocation Information

The summation of the budget according to the phases of the project can be found below:

Other Expenses:

1. Training:
 - a. Project Initiation: 20000 TL
2. Equipment:
 - a. Project Initiation: 4875 TL

- b. Requirements Engineering: 2500 TL
 - c. System Design: 1500 TL
 - d. Implementation: 3375 TL
 - e. Testing: 2375 TL
 - f. Deployment: 1625 TL
 - g. Maintenance and Support: 1625 TL
3. Computer Hardware and Software:
- a. Project Initiation: 2252 TL
 - b. Requirements Engineering: 1125 TL
 - c. System Design: 563 TL
 - d. Implementation: 1688 TL
 - e. Testing: 1001 TL
 - f. Deployment: 814 TL
 - g. Maintenance and Support: 814 TL
4. Service Contracts:
- a. Implementation: 25000 TL
 - b. Deployment: 55000 TL
5. Transportation:
- a. Project Initiation: 1188 TL
 - b. Requirements Engineering: 1000 TL
 - c. System Design: 638 TL
 - d. Implementation: 1350 TL
 - e. Testing: 800 TL
 - f. Deployment: 710 TL
 - g. Maintenance and Support: 710 TL
6. Facilities:
- a. Project Initiation: 1402 TL
 - b. Requirements Engineering: 1250 TL
 - c. System Design: 713 TL
 - d. Implementation: 1688 TL
 - e. Testing: 1001 TL
 - f. Deployment: 738 TL
 - g. Maintenance and Support: 738 TL
7. Administrative and Janitorial Services:
- a. Project Initiation: 500 TL
 - b. Requirements Engineering: 300 TL
 - c. System Design: 500 TL
 - d. Implementation: 100 TL
 - e. Testing: 300 TL
 - f. Deployment: 400 TL
 - g. Maintenance and Support: 200 TL

Staff Payment Expenses:

- Project Initiation: 105,000 TL
- Requirements Engineering: 161,000 TL
- System Design: 199,000 TL

- Implementation: 225,000 TL
- Testing: 255,000 TL
- Deployment: 225,000 TL
- Maintenance and Support: 255,000 TL

Cumulative Other Expenses:

- Training: 20,000 TL
 - Equipment: 17,875 TL
 - Computer Hardware and Software: 8,257 TL
 - Service Contracts: 80,000 TL
 - Transportation: 6,396 TL
 - Facilities: 7,530 TL
 - Administrative and Janitorial Services: 2300 TL
- ❖ Staff Payment Expenses in Total: 1,461,000
 ❖ Other Expenses in Total: 142,358

Procurement

This section of the Project Management Plan (PMP) lists the goods and services that will be purchased for the project and outlines how they will be obtained. It specifies the types of contracts to be used, identifies the responsible parties for conducting the procurement, mentions the sources of standard procurement requests, and provides deadlines for obtaining each good and service, along with the lead times required for the procurement process.

1. Goods and Services:

- a. External MongoDB Database
 - Contract Type: Service Agreement
 - Procurement Lead: Senior Project Managers
 - Standard Procurement Request: Request for Proposal (RFP)
 - Deadline for Obtaining: Nov 03, 2023
 - Lead Time: 3 days
- b. External Service for Secure Payment
 - Contract Type: Service Agreement
 - Procurement Lead: Senior Project Managers
 - Standard Procurement Request: Request for Proposal (RFP)

- Deadline for Obtaining: Nov 03, 2023
 - Lead Time: 3 days
- c. External Production Server
 - Contract Type: Purchase Agreement
 - Procurement Lead: Senior Project Managers
 - Standard Procurement Request: Purchase Order (PO)
 - Deadline for Obtaining: Jan 12, 2024
 - Lead Time: 5 days
- d. External Production Database
 - Contract Type: Service Agreement
 - Procurement Lead: Senior Project Managers
 - Standard Procurement Request: Request for Proposal (RFP)
 - Deadline for Obtaining: Jan 12, 2024
 - Lead Time: 5 days

2. Procurement Process:

The procurement process for the above-mentioned goods and services will involve the following steps:

- a. Identification of Needs:
 - ❖ The Senior Project Managers, in collaboration with the project team, will identify the specific requirements for each external component and service.
- b. Vendor Selection:
 - ❖ The Senior Project Managers will evaluate potential vendors based on criteria such as experience, reputation, cost, and compatibility with project requirements.
- c. Contract Negotiation:
 - ❖ The Senior Project Managers will negotiate the terms and conditions of the contracts with the selected vendors, ensuring alignment with project goals and objectives.
- d. Procurement Execution:
 - ❖ Upon contract agreement, the Senior Project Managers will initiate the procurement process according to the specified standard procurement requests (RFP, PO, etc.).
- e. Delivery and Acceptance:
 - ❖ The project team, in collaboration with the Senior Project Managers, will ensure the timely delivery and acceptance of the procured goods and services.

Disposal

This section of the Project Management Plan (PMP) outlines the necessary steps and considerations for the decommissioning, demolition, or disposal of software and/or systems within the project. It provides a comprehensive breakdown of the activities involved, along with the roles, responsibilities, and requirements associated with the disposal process, including any subcontracted services.

1. Decommissioning and/or Disposal Activities:

a. System De-Integration:

- The Senior Project Managers will oversee and coordinate the de-integration of the system(s) from the operational environment, including external subcontracted services such as the MongoDB database, third-party payment security services, production servers, and production databases.
- The Senior Front-End Developers, Junior Back-End Developers, and Junior Mobile Developers will collaborate to ensure the proper removal of software components and integration points associated with the subcontracted services.

b. Demolition or Disposal Work:

- The Senior Project Managers will be responsible for planning and managing the demolition or disposal activities, including the removal of subcontracted services.
- The Senior Front-End Developers, Junior Back-End Developers, and Junior Mobile Developers will assist in the dismantling and removal of software components and configurations associated with the production environment and subcontracted services.

c. Waste Removal:

- The Senior Project Managers will ensure the proper removal and disposal of any waste resulting from the decommissioning or disposal process, adhering to applicable guidelines and regulations.
- The Senior QA Engineers will validate the successful removal of waste and assess compliance with disposal regulations.

2. Decommissioning Readiness Review (DRR) Requirements

a. DRR Planning:

- The Senior Project Managers will plan and conduct a Decommissioning Readiness Review (DRR) to assess the readiness of the project for decommissioning and/or disposal activities, including subcontracted services.
- The Senior QA Engineers will collaborate with the development team to perform necessary testing and quality assurance activities for the DRR, including validating the proper disconnection and removal of subcontracted services.

b. DRR Execution:

- The Senior Project Managers will lead the DRR process, ensuring that all predefined criteria and requirements are met prior to decommissioning or disposal, including subcontracted services.
- The Senior Front-End Developers, Junior Back-End Developers, and Junior Mobile Developers will address any identified issues or gaps during the DRR process, including the proper disconnection and removal of subcontracted services.

3. Subcontracting Responsibilities

a. Demolition or Disposal Subcontracting:

- The technical actions that needs to be performed including the subcontracted services are given above in the sections Decommissioning and/or Disposal Activities and Decommissioning Readiness Review (DRR) Requirements when necessary. The following bullet points are the additional actions that needs to be taken in the special case of demolition of subcontracting.
- In the event of subcontracting any demolition or disposal work, including subcontracted services, the Senior Project Managers will identify suitable vendors or contractors based on predefined criteria.
- The Senior Project Managers will define the responsibilities and expectations for the subcontractors, ensuring successful completion of the assigned tasks, including the proper handling and disposal of waste, hardware components, and subcontracted services.

PROJECT ASSESSMENT AND CONTROL

General

To effectively assess and control for the project ALIZE, a comprehensive set of procedures will be implemented. First and foremost, it is crucial to define and document clear product requirements, ensuring that all stakeholder needs and expectations are captured and documented. Additionally, establishing a robust change control process is essential to manage any modifications to the product requirements. This process includes a thorough assessment of proposed changes, analyzing their impact on the project scope, schedule, budget, and resources, and obtaining appropriate approvals before implementation.

In parallel, project management methodology, Waterfall, will be employed to provide a structured approach for managing the project. Utilizing from Waterfall methodology offer guidelines for planning, executing, and controlling projects, thereby helping to maintain the project scope, schedule, budget, and resource allocation.

To ensure the quality of acquired products from subcontractors, it is imperative to implement quality assurance processes. These processes will involve conducting regular inspections, audits, and testing to ensure compliance with defined quality standards. Clear quality acceptance criteria will be established, and thorough reviews will be performed before accepting subcontracted products.

Continuous monitoring of project progress against the established schedule and budget is essential. This entails employing appropriate project management tools and techniques to track and identify any deviations, risks, or issues that may affect the project's timeliness and quality. Prompt corrective actions will be taken to address any concerns and keep the project on track.

In addition to monitoring project progress, it is vital to conduct regular reviews of work processes and work products to assess their quality. This will involve peer reviews, and audits to identify and rectify any deviations, non-compliance, or defects. These reviews serve as opportunities for continuous improvement, enabling the refinement of work processes based on lessons learned.

Maintaining effective communication among project stakeholders, subcontractors, and team members is paramount. Regular updates on project status, addressing concerns, and providing feedback are essential for maintaining alignment and resolving any issues promptly. Effective communication fosters collaboration and ensures that everyone is working towards the same goals.

A robust risk management process will be implemented to proactively identify and address potential risks. This involves conducting risk assessments, developing mitigation strategies, and implementing contingency plans to minimize the impact of risks on project objectives.

Monitoring subcontractor performance is crucial to ensure the quality and timeliness of their deliverables. This can be achieved by regularly evaluating subcontractor performance against predefined quality and timeliness criteria. Establishing key performance indicators (KPIs) and metrics provides an objective measure of their performance. Any performance issues will be promptly addressed through effective communication, corrective actions, or, if necessary, contract modifications.

Lastly, capturing and applying lessons learned throughout the project is essential for ongoing improvement. Analyzing successes, failures, and best practices enables the refinement of processes, enhancement of product quality, and optimization of resource allocation in future projects.

By following these detailed procedures, project team of Alize can systematically assess and control product requirements, project scope, schedule, budget, resources, quality of acquired products, work processes, and work products, ensuring successful project outcomes.

Requirements Management

The Requirements Management section outlines the control mechanisms for measuring, reporting, and managing changes to both project and product requirements. It specifies the processes and techniques, including the use of Requirements Traceability Matrices, to assess the impacts of requirements changes on product scope, quality, project schedule, budget, resources, risks, and performance throughout the project's life cycle.

Change Control Mechanisms

- Change Identification: Processes will be established to identify and document proposed changes to both project and product requirements.
- Change Assessment: A systematic approach, such as impact analysis, will be employed to evaluate the potential impacts of requirements changes on various project aspects.
- Change Approval: A change control board or designated stakeholders will review and approve or reject requirements changes based on their impact assessment and alignment with project objectives.

Requirements Impact Assessment

- Product Scope and Quality: Requirements changes will be assessed to determine their impact on the product's scope and quality, ensuring that they align with the desired outcome and meet stakeholder expectations.
- Project Schedule and Budget: Impacts on project schedule and budget resulting from requirements changes will be evaluated to understand the resource and financial implications.
- Resources and Risk: The effects of requirements changes on resource allocation, risk management, and team dynamics will be considered to maintain project effectiveness.

- Performance: The potential effects on the overall project performance and achievement of goals will be assessed.

Requirements Control Technique: Requirements Traceability Matrices

- Requirements Traceability Matrices: Requirements Traceability Matrices (RTMs) will be employed as a technique for requirements control. RTMs establish links between project objectives, product requirements, and associated deliverables, ensuring transparency and accountability in requirements management.
- Mapping: RTMs will map project objectives to specific product requirements and provide traceability from high-level project goals to detailed requirements.
- Verification and Validation: RTMs will aid in verifying that each requirement is correctly implemented and validated against the project objectives.
- Impact Analysis: RTMs will facilitate impact analysis by identifying the relationships between requirements and their associated project dimensions such as schedule, budget, resources, risks, and performance.
- Change Management: RTMs will be regularly updated to reflect approved requirements changes, ensuring that the impact of changes is properly tracked and managed.

Requirements Control Documentation

- Requirements Change Log: A comprehensive change log will be maintained, documenting all proposed and approved requirements changes, along with their impact assessments and authorization details.
- Requirements Traceability Matrix: An up-to-date Requirements Traceability Matrix will be created and maintained to establish and track the relationships between requirements, project objectives, and associated deliverables.
- Lessons Learned: Lessons learned from requirements changes and their management, including the use of RTMs, will be captured and shared to improve future project planning and requirements processes.

Scope Change Control

The Scope Change Control section outlines the processes and procedures to detect activities that fall outside the defined scope of the project. It also defines the actions to be taken when such activities are identified or requested. The objective is to ensure that any changes to the project scope are properly assessed, controlled, and managed to minimize the impact on project objectives.

Scope Change Identification

- Regular Monitoring: The project team will proactively monitor project activities to identify any potential scope changes or activities that deviate from the agreed-upon project scope.

- Stakeholder Inputs: Project stakeholders, including the client, end-users, and project team members, will be encouraged to report any activities that may introduce scope changes.

Scope Change Assessment

- Impact Analysis: Once a potential scope change is identified, a thorough impact analysis will be conducted to assess the implications on project objectives, deliverables, timeline, resources, and costs.
- Documentation: The scope change, along with its impact assessment, will be documented using a standardized Scope Change Request form.

Scope Change Approval

- Review and Evaluation: The project team, along with relevant stakeholders, will review the impact analysis and evaluate the necessity and feasibility of the proposed scope change.
- Decision Making: The project sponsor or designated change control board will make the final decision on whether to approve or reject the scope change request.
- Change Authorization: Approved scope changes will be formally authorized and documented, including any adjustments to the project plan, schedule, budget, and resources.

Scope Change Implementation

- Planning and Execution: If the scope change is approved, the project team will plan and execute the necessary adjustments to accommodate the change effectively.
- Communication: All relevant stakeholders will be informed about the approved scope change and its implications on project deliverables, timelines, and resources.

Scope Change Control Documentation

- Change Log: A comprehensive change log will be maintained, documenting all approved scope changes, their rationale, impact assessment, and authorization details.
- Lessons Learned: Throughout the project, lessons learned from scope changes and their management will be captured and incorporated into future project improvement initiatives.

Schedule Control

The Schedule Control section outlines the control mechanisms and techniques to measure and monitor the progress of work completed at major and minor project milestones. It specifies the methods and tools to be used for measuring and controlling schedule progress, with a focus on employing earned value techniques. The objective

is to compare actual progress against planned progress, identify deviations, and implement corrective actions to ensure project schedule adherence.

Progress Measurement at Milestones

- Major and Minor Milestones: The project will establish key milestones to track progress and evaluate the completion of significant deliverables and project phases.
- Objective Criteria: Objective criteria will be defined to assess the achievement of schedule milestones, based on the scope and quality of work products completed at each milestone.
- Baseline Comparison: The actual progress will be compared to the baseline schedule to determine if the project is on track or requires corrective action.

Earned Value Techniques

- Earned Value Analysis: Earned value techniques will be employed to measure the progress of work by integrating scope, schedule, and cost aspects. This analysis will provide insight into the project's performance and help in forecasting future progress.
- Schedule Performance Index (SPI): The SPI will be calculated by comparing the earned value of completed work to the planned value. It will indicate if the project is ahead or behind schedule.
- Cost Performance Index (CPI): The CPI will be calculated by comparing the earned value of completed work to the actual cost. It will provide insights into the project's cost efficiency.

Schedule Control Mechanisms

- Tracking and Monitoring: The project team will continuously track and monitor actual progress against the planned schedule, updating the project schedule as necessary.
- Deviation Identification: Any deviations between actual progress and planned progress will be identified, analyzed, and documented for further evaluation.
- Corrective Action: When deviations are identified, appropriate corrective actions will be implemented to realign the project schedule with the planned progress. This may include resource adjustments, schedule optimization, or reassignment of tasks.

Schedule Control Plan

- Methods and Tools: The schedule control plan will define the specific methods, techniques, and tools to be used for measuring, monitoring, and controlling schedule progress. This may include project management software, Gantt charts, progress tracking tools, and regular project status meetings.
- Reporting and Communication: The plan will outline the frequency and format of schedule progress reporting, as well as the communication channels and stakeholders involved.

Lessons Learned and Continuous Improvement

- Lessons Learned: Throughout the project, lessons learned from schedule control activities will be captured, documented, and shared with the project team for future improvement initiatives.
- Continuous Improvement: The project manager will review and analyze the effectiveness of the schedule control measures, making necessary adjustments to improve future project scheduling and control processes.

Budget Control

The Budget Control section outlines the control mechanisms and processes to measure the cost of work completed, compare planned costs to budgeted costs, and implement corrective actions if actual costs deviate from the budgeted costs. The objective is to ensure effective financial management throughout the project lifecycle.

Cost Measurement and Comparison

- Cost Tracking: Regular cost tracking will be conducted to measure the actual cost of work completed against the planned budget.
- Budget Comparison: A comparison between planned costs and budgeted costs will be performed to identify any variations and deviations.

Corrective Action Implementation

- Deviation Analysis: Any discrepancies between actual costs and budgeted costs will be analyzed to determine the root causes and potential impact on project objectives.
- Corrective Measures: Appropriate corrective actions will be defined and implemented to address budget deviations promptly.
- Change Control: Significant budget changes that require adjustments to the project plan, timeline, or scope will follow the established change control procedures.

Cost Reporting and Management

- Reporting Intervals: Cost reporting intervals will be defined in the budget control plan, specifying the frequency of reporting on project expenditures and financial status.
- Methods and Tools: The budget control plan will outline the methods and tools to be utilized for managing and tracking project budget, such as accounting software, financial management systems, or spreadsheets.

Milestones and Objective Indicators

- Milestone Assessment: The budget plan will incorporate frequent milestones that can be objectively assessed to measure the achievement of project goals, scope, and quality of work products.
- Objective Indicators: Objective indicators, such as earned value analysis, will be employed to report on the budget and schedule plan, schedule progress, and the cost of work completed.

Budget Control Documentation

- Budget Plan: A comprehensive budget plan will be documented, outlining the approved budget, cost management procedures, reporting intervals, and tools utilized for budget control.
- Cost Performance Reports: Regular cost performance reports will be generated, providing insights into the project's financial status, cost trends, and any corrective actions implemented.
- Lessons Learned: Lessons learned related to budget control and financial management will be captured and shared to improve future project planning and budgeting processes.

Quality Assurance

The Quality Assurance section specifies the quality goals and outlines the resources and mechanisms to be employed for measuring and controlling the quality of work processes and resulting work products. The Quality Assurance plan encompasses provisions for vendor evaluation and control, ensuring the project adheres to the defined quality standards.

Quality Goals

- Definition: Clear and measurable quality goals will be established to guide the project team in achieving the desired level of quality for work processes and deliverables.
- Alignment: Quality goals will be aligned with project objectives, stakeholder requirements, industry standards, and best practices.

Quality Measurement and Control

- Work Processes: Quality assurance activities will be implemented to ensure adherence to defined work processes and methodologies throughout the project lifecycle.
- Work Product Evaluation: Mechanisms will be in place to evaluate and control the quality of work products, such as software code, documentation, design artifacts, and user interfaces.

Vendor Evaluation and Control

- Vendor Selection: The quality assurance plan will outline criteria for vendor evaluation, ensuring vendors meet defined quality standards and requirements.
- Vendor Monitoring: Regular assessments and audits will be conducted to monitor vendor performance and adherence to quality standards.
- Corrective Actions: In case of any quality issues identified with vendors, appropriate corrective actions will be implemented, including vendor improvement plans or re-evaluation of vendor contracts.

Quality Control Mechanisms

- Verification and Validation: Verification activities will be conducted to ensure that work products meet specified requirements, while validation activities will focus on confirming that the final deliverables meet stakeholder expectations.
- Joint Reviews: Collaborative reviews involving project team members, stakeholders, and subject matter experts will be performed to assess the quality of work processes and deliverables.
- Audits: Periodic audits will be conducted to verify compliance with defined quality processes, standards, and procedures.
- Process Assessment: Process assessments will be performed to identify areas for improvement, streamline processes, and enhance overall quality performance.

Quality Assurance Documentation

- Quality Assurance Plan: A comprehensive quality assurance plan will be documented, encompassing quality goals, measurement approaches, control mechanisms, and vendor evaluation processes.
- Quality Reports: Regular quality reports will be generated, providing insights into quality metrics, findings, and recommendations for improvement.
- Lessons Learned: Lessons learned from quality assurance activities and outcomes will be captured and utilized to refine quality processes and enhance future project performance.

Subcontractor Management

The Subcontractor Management section outlines the plans for selecting and managing subcontractors who will contribute work products to the project. This section specifies the criteria for selecting subcontractors and outlines the management plan for each subcontract, which includes tailored versions of this document. The subcontractor plans aim to ensure successful completion of each subcontract by incorporating the following elements:

Subcontractor Selection Criteria

- Technical Expertise: Subcontractors must demonstrate expertise in the specific technology stack required for the project, with proven experience in similar software development projects.

- Track Record: Subcontractors with a successful track record in delivering high-quality software products on time and within budget will be preferred.
- Capacity and Resources: Subcontractors must have adequate resources and capacity to handle the assigned project work, including skilled developers, testing infrastructure, and project management capabilities.
- Cost: Competitive pricing that aligns with the project budget and value for money will be considered during the selection process.

Subcontract Management Plan

For each subcontract, a tailored management plan will be developed that includes the following:

- Requirements Management: Detailed requirements specifications will be provided to the subcontractor, clearly defining the desired functionality, performance, and user experience of the subcontracted work.
- Technical Progress Monitoring: Regular status meetings and progress reports will be scheduled to monitor the subcontractor's technical progress, identify any issues or delays, and ensure adherence to project milestones.
- Schedule and Budget Control: The subcontractor's schedule and budget will be closely monitored against the agreed-upon deliverables and cost estimates. Variance analysis will be conducted to identify any deviations, and corrective actions will be implemented as necessary.
- Product Acceptance Criteria: Specific acceptance criteria, including functional and non-functional requirements, performance benchmarks, and quality standards, will be defined and communicated to the subcontractor to ensure the delivered work meets the project's expectations.
- Quality Assurance and Measurement: Quality assurance processes, including code reviews, testing procedures, and documentation standards, will be established to ensure the subcontractor's work aligns with the project's quality objectives. Key quality metrics will be defined, and regular quality audits will be conducted.
- Risk Management: A risk register will be maintained, identifying potential risks associated with subcontracted work. Mitigation strategies and contingency plans will be developed and monitored to address any identified risks.

Subcontractor Documentation

- Subcontract Agreement: A formal subcontract agreement will be prepared, clearly outlining the scope of work, deliverables, timelines, payment terms, intellectual property rights, and confidentiality clauses. The agreement will be signed by both parties.
- Point of Contact: A dedicated project manager from the prime contractor's team will be assigned as the main point of contact for each subcontract, facilitating communication, issue resolution, and coordination between the prime contractor and subcontractor.

Project Closeout

The Project Closeout section outlines the plans necessary to ensure an orderly and structured closure of the project. It includes various activities and considerations to wrap up the project, document lessons learned, and archive project materials.

Staff Reassignment Plan

- Resource Reallocation: A plan will be developed to determine the reassignment or release of project team members once their project responsibilities are completed.
- Transition Planning: Efforts will be made to ensure a smooth transition for team members to new projects or roles within the organization.

Project Materials Archiving Plan

- Documentation and Artifacts: A plan will be established for organizing, storing, and archiving project materials, including project plans, requirements documents, design artifacts, code repositories, test results, and other relevant deliverables.
- Storage and Access: Considerations will be made for selecting appropriate storage methods, backup procedures, and access controls to preserve project materials for future reference and compliance requirements.

Post-Mortem Debriefings and Lessons Learned

- Debriefing Sessions: Post-mortem debriefing sessions will be conducted with project personnel to gather insights, experiences, and feedback on project execution, challenges faced, and opportunities for improvement.
- Lessons Learned Documentation: Lessons learned from the project, including successes, failures, and best practices, will be documented to provide valuable insights for future projects. These will be included in the project's final report.

Preparation of Final Report

- Final Report Contents: A comprehensive final report will be prepared, summarizing the project's objectives, achievements, challenges, lessons learned, and recommendations for future projects.
- Analysis of Project Objectives: The final report will include an analysis of the project's objectives to assess the extent to which they were achieved, highlighting areas of success and areas for improvement.

Project Closure Documentation

- Closeout Plan: A detailed project closeout plan will be documented, outlining the specific activities, responsibilities, and timelines for each closeout task.
- Project Closure Checklist: A checklist will be created to ensure that all necessary activities, deliverables, and documentation are completed before officially closing the project.

PRODUCT DELIVERY

The product delivery approach for Project Alize involves a phased development and deployment strategy. Alize, the B2B e-commerce platform, will be designed, developed, and tested in a series of iterative phases, each resulting in a tangible deliverable with incremental features.

The phased approach allows the Alize team to provide iterative deliverables for stakeholder review and feedback, ensuring the final product aligns with the stakeholder needs. The phased deliverables include the development of the B2B trade platform, registration features for Turkish manufacturers and foreign customers, secure payment systems, messaging systems, and an admin panel with analytical tools.

Information Flow

To ensure seamless delivery, open and efficient communication is crucial. The information flow for Project Alize will be maintained internally through regular project status meetings, progress reports, and digital collaboration tools. Externally, we will have frequent check-ins with stakeholders, where we provide updates, gather feedback, and align on the project direction.

Packaging and Physical Delivery Plans

Given the digital nature of our product, traditional physical delivery methods do not apply. Instead, our 'packaging' for Project Alize will consist of deploying the platform on a live server, where users can access it. After a thorough testing phase, the platform will be released to the public.

Customer Documentation

Comprehensive documentation will accompany the release of the Alize platform. This will include:

User Manuals: Detailed guide on how to use the platform, covering all aspects from registration to purchase.

Operation Manuals: A guide for platform administrators to manage users, products, payments, and orders.

Maintenance Manuals: Information about updating, troubleshooting, and ensuring the smooth operation of the Alize platform.

Training Materials: Video tutorials and FAQs will be provided for both Turkish manufacturers and foreign customers.

Project Completion Determination

For Project Alize, completion is determined by the successful deployment of the platform with all its planned features working seamlessly, alongside the successful registration of Turkish manufacturers and foreign customers. Furthermore, completion will also be determined by the successful operation of the secure payment systems, messaging systems, and the admin panel with analytical tools.

The completion of Project Alize will be demonstrated by the functionality of the live platform, feedback from users, and the achievement of pre-defined success metrics.

Decommissioning/Disposal

As a software development project, there won't be physical disposal or decommissioning. However, in case of discontinuation or termination of Project Alize, data security measures will be in place to ensure all user information is safely deleted. In such cases, users will be informed ahead of time and given instructions on how to manage their data.

SUPPORTING PROCESSES

General

The success of Project Alize hinges not only on the core development tasks but also on an array of supporting processes that ensure the project runs smoothly. These include project supervision and work environment, decision management, risk management, configuration management, information management, quality assurance and measurement.

Project Supervision and Work Environment

In Project Alize, the Project Manager will create an environment that encourages collaboration, free information flow, and judicious resource utilization. The manager will maintain daily supervision, providing guidance, setting performance goals, and resolving conflicts. There will be clear communication about role-based constraints and individual tasks. Regular team meetings will be scheduled for updates and clarifications to maintain a smooth workflow.

Decision Management

Project Alize will employ a tiered decision-making strategy, based on the nature and importance of each decision. This will be categorized into various levels, from routine operational decisions to critical strategic decisions. For each category, specific stakeholders will be identified for involvement. Desired outcomes, success criteria, and tracking mechanisms will be documented for every decision category, ensuring a comprehensive decision management process. Regular reviews will be conducted to evaluate the effectiveness of decisions and modify strategies accordingly.

Risk Management

Risk management in Project Alize will be a proactive and iterative process, starting with risk identification, followed by risk analysis, prioritization, and response planning. The QA team will track and monitor these risks throughout the project. High-priority risks will be escalated to the Project Manager for immediate action. Regular risk assessments will be carried out to identify new risks and evaluate the effectiveness of current risk response strategies.

Configuration Management

Configuration management in Project Alize will ensure proper tracking and control of all project components. Starting with the initial baseline of work products, all subsequent changes will be recorded, evaluated, and approved before implementation. A dedicated Configuration Management team will oversee this process, using automated configuration management tools where necessary. This will ensure that any modifications in the project's components are controlled and traceable.

Information Management

General

The Information Management plan for Project Alize is designed to identify, organize, and protect all vital project information. We'll specify formats for representation, responsibilities for data categories, storage protocols, data access control, and proper disposal methods. This plan encompasses protection measures for both customer and vendor information to ensure data integrity and confidentiality.

Project Information Management

Project Alize's information management plan includes strategies for generating both non-deliverable and deliverable work products. Clear responsibilities will be assigned to organizational entities regarding input, generation, and review of various information items. Non-deliverable work products will include elements such as requirements specifications, design documentation, traceability matrices, test plans, meeting minutes, and review reports.

On the other hand, deliverable work products will comprise of items like source code, user manuals, an online help system, regression test suites, configuration libraries and management tools, operation principles, maintenance guides, and more. Our plan will detail all these information items, providing a controlling template or standard for each, identifying who will prepare and review them, due dates, and the distribution list for review and baseline versions.

Communication and Publicity

The Communication and Publicity plan for Project Alize will ensure transparent and timely communication with all relevant stakeholders. We will specify the types of information to be communicated, the format, content, and level of detail appropriate for each stakeholder group. Our communication tools will incorporate various publicity and marketing strategies.

This plan will also designate responsibilities for each communication element, the recipient(s), the communication methods and technologies to be used, and the frequency of communication. It will detail how unresolved issues will be escalated and the procedures for document distribution within and outside the project team.

If certain aspects of communication, like marketing, fall outside the project scope, this will be stated explicitly, and we will outline how these aspects will be addressed. Furthermore, the plan will include provisions for regular updates to keep it aligned with the evolving project needs.

Quality Assurance

Quality Assurance for Project Alize ensures that all project commitments, pertaining to both system and software processes and products, are fulfilled in accordance with the requirements specification, the PMP, and any standards, procedures, or guidelines that the project must adhere to. Our quality assurance procedures encompass a range of techniques, including analysis, inspections, reviews, audits, and assessments, aiming to prevent defects and ensure the final product meets all agreed-upon specifications. We have designed a systematic process, with specific procedures for every stage, to monitor the entire project lifecycle. The Quality Assurance team will ensure adherence to the process specifications and will carry out regular audits and assessments, with the findings reported directly to project management. The relationship between Quality Assurance and other processes such as verification and validation, review, audit, configuration management, and systems engineering is an interactive one, each feeding into and informing the others. For instance, validation activities confirm that the system meets the requirements of the user, customer, or stakeholder. Meanwhile, configuration management activities ensure that changes to the system are documented, authorized, and controlled, maintaining the integrity of the system throughout its life. In parallel, reviews and audits ensure compliance with the prescribed procedures, while systems engineering focuses on optimizing the overall system, considering both technical and non-technical constraints. Quality Assurance also has a critical relationship with assessment and acceptance processes. The assessment process evaluates the performance and effectiveness of both system and software processes, allowing identification and implementation of necessary improvements. The acceptance process, on the other hand, confirms that the system or product is ready for delivery or deployment, ensuring it meets all defined acceptance criteria. Overall, Quality Assurance in Project Alize guarantees that all system and software processes and products adhere to the highest standards, thereby ensuring the delivery of a high-quality end product.

Measurement

In the Measurement for Project Alize, we outline the precise methods, tools, and techniques that will be utilized to collect, record, and maintain project metrics. The measurement plan is specifically designed to cater to the identified information needs of the project. It articulates what measures need to be collected, ensuring that every stakeholder understands these measures' purpose and application. This clarity helps maintain consistency across all processes, departments, and stakeholders. The measures collected will vary depending on the stage of the project but may include variables such as project performance metrics, product quality metrics, and process efficiency metrics. Each measure collected has a specific definition which aids in understanding the purpose of the metric and provides clarity on what constitutes a successful outcome. For example, the 'schedule variance' metric measures the difference between the planned schedule and the actual progress, giving an indication of the project's timeline performance. A suite of analytical tools and techniques will be used to validate

and analyze the collected measures. Validation ensures the measures are accurate and reflect the reality of the project, while analysis helps in understanding patterns, trends, and any potential areas of concern. The reporting methodology of these measures will be clearly defined in the measurement plan, including frequency, distribution list, format, and interpretation guidelines. Clear, concise, and timely reporting of these measures is crucial to the successful monitoring and control of the project. The measurement plan for Project Alize ensures a standardized approach to the collection and analysis of project metrics, contributing to informed decision-making, effective project control, and continual process improvement.

Reviews and Audits

In the "Reviews and Audits" part of Project Alize's Project Management Plan (PMP), we will outline when reviews and audits will take place, who will do them, and how they will be done. We will also explain what resources we need to complete them successfully. Firstly, reviews and audits are important checks we carry out during the project. They help us make sure we are meeting our goals and following all the right steps. They are a chance to spot any issues or problems, and to make any necessary adjustments. The schedule for reviews and audits will tell us when they need to happen. This could be at key milestones, or at regular intervals throughout the project. We will also need to decide who will do the reviews and audits. This could be members of the project team, managers, or even outside agencies. The choice of reviewer or auditor will depend on the nature of the project and the specific item being reviewed or audited. The methods and procedures for carrying out the reviews and audits need to be clearly defined. This includes what they need to check, what standards they should use, and how they should report their findings. We will conduct different types of reviews and audits, including joint reviews with the customer, progress reviews by managers, peer reviews by other developers, quality audits, and possibly reviews and audits by the customer themselves. Sometimes, outside agencies may need to approve or regulate parts of our project. If this is the case, we will list these agencies in this section of the PMP, along with the procedures for getting their approval or meeting their regulations. By planning our reviews and audits carefully, we can make sure our project stays on track, and that we maintain high standards throughout.

Verification and Validation

This section for Project Alize contains the framework for our verification and validation strategies, offering an overview of the scope, tools, techniques, and roles and responsibilities related to these critical activities.

Scope

The verification and validation plan will encompass all project activities, from preliminary design reviews to post-delivery product assessments. The purpose is to ensure that the outputs of each phase of the project align with the requirements defined for that phase, and that the final product meets the specified requirements and performs its intended function effectively.

Tools and Techniques

For verification, we will employ various techniques including:

Traceability: Ensuring all requirements are linked to their origin and can be traced throughout the project lifecycle.

Milestone Reviews: Checking at predetermined points in the project whether established goals have been achieved.

Peer Reviews: Encouraging colleagues to scrutinize and provide feedback on project deliverables.

Prototyping: Developing a working model of the system or parts of it to verify feasibility and functionality.

Simulation and Modelling: Using virtual representations to verify product behavior under different conditions.

For validation, we will rely on techniques such as:

Testing: Conducting systematic investigations to ensure the system works as intended.

Demonstration: Showing the system in operation to establish it performs as required.

Analysis: Reviewing the system's performance data to confirm it meets operational requirements.

Inspection: Examining the physical components and their assembly to ensure they meet specified requirements.

We will make use of automated tools to aid in verification and validation. Specific software will be determined based on the project needs and will be updated in this document at that time.

Roles and Responsibilities

The Project Alize team will have distinct roles for development and verification and validation activities, maintaining an appropriate degree of independence between these functions. The project manager will oversee the overall execution, with support from dedicated verification and validation teams. These teams will be responsible for planning, executing, and documenting the verification and validation processes, ensuring objectivity and thoroughness. The organizational hierarchy and detailed roles and responsibilities of team members for these processes will be articulated in a subsequent section of this document. This approach promotes accountability, enhances the quality of the results, and ensures the intended purpose of the project is realized.

ADDITIONAL PLANS

These plans encompass various aspects such as:

- Safety Assurance Plan: Ensuring that the platform adheres to safety standards and guidelines to protect users and their data.
- Privacy and Security Plan: Implementing robust measures to safeguard user information and maintain the confidentiality of transactions.
- Special Facilities or Equipment Plan: Identifying and acquiring any specialized facilities or equipment needed to support the operations and scalability of the platform.
- Product Installation Plan: Defining the procedures and guidelines for seamless installation and setup of the Alize platform for users.
- User Training Plan: Developing comprehensive training programs to empower users with the knowledge and skills to effectively utilize the platform.

These additional plans collectively contribute to the successful implementation, operation, and continuous improvement of the Alize platform, ensuring its reliability, effectiveness, and customer satisfaction.

END MATTER

The End Matter section of this Project Management Plan includes annexes, an index, and a glossary to provide additional details, improve usability, and reduce ambiguity in terminology.

Annexes

The following annexes are included to provide comprehensive supporting details, additional documentation, and references that enhance the understanding and usability of the Project Management Plan. The annexes in this section are references to other information items. To get a more comprehensive information in desired item, the relevant annexes can be obtained and investigated.

1. Annex A: Project Charter

- This annex includes the complete Project Charter document, which serves as the foundation for the project and provides a clear and concise description of the project's objectives, scope, deliverables, and high-level approach.

2. Annex B: Communication Plan

- This annex details the communication plan, including a stakeholder communication matrix, communication channels, escalation procedures, and guidelines for effective project communication and collaboration.

3. Annex C: Stakeholder Analysis and Communication Matrix

- This annex includes a stakeholder analysis, identifying key stakeholders, their roles, interests, and communication preferences. It also provides a communication matrix outlining the communication channels, frequency, and purpose for engaging with each stakeholder.

Glossary

- ➔ PMP: It means Project Management Plan and it contains the detailed planning of the project in various aspects.

- Project Charter: It is a concise document that outlines the project's purpose, objectives, stakeholders, and high-level plan, serving as a formal authorization and guiding tool for project initiation and execution.
- WBS: It means Work Breakdown Structure and it is a hierarchical decomposition of the project deliverables, tasks, and sub-tasks, providing a visual representation of the project scope and enabling effective planning, organizing, and tracking of work.
- RFP: It means Request for Proposal and it is a document that solicits bids from potential vendors or contractors by outlining project requirements, scope of work, and evaluation criteria.
- PO: It means Purchase Order and it is a legally binding document issued by a buyer to a seller, specifying the details of goods or services to be purchased, including quantities, prices, terms, and delivery dates.
- DRR: It means Decommissioning Readiness Review and it is a comprehensive evaluation process conducted to assess the readiness of a system, facility, or project for decommissioning, ensuring that all necessary requirements, plans, and preparations are in place prior to decommissioning activities.
- KPI: It means Key Performance Indicator and it is quantifiable metrics used to measure the success or effectiveness of an organization, project, or process in achieving its objectives.
- CI/CD: It means Continuous Integration/Continuous Deployment and it is a software development practice that involves automating the build, testing, and deployment of applications to enable frequent and reliable delivery of software updates.
- RTM: It means Requirements Traceability Matrix and it is a document that establishes the relationship between project requirements and other project deliverables to ensure comprehensive coverage and traceability throughout the project lifecycle.
- SPI: It means Schedule Performance Index and it is a metric used in project management to measure the efficiency and progress of the project schedule by comparing the earned value of completed work to the planned value.
- CPI: It means Cost Performance Index and it is a metric used in project management to measure the efficiency of budget utilization by comparing the value of work completed to the actual cost spent.

CONTRIBUTIONS

Below is the list of team members and the contributions of each member to the Project Management Plan (PMP).

1. Erdem Ege Eroğlu

- Executive Summary
- Front Matter
- Project Overview
- Project Summary
 - Purpose, Scope, and Objectives
 - Assumptions and Constraints
 - Project Deliverables
 - Schedule and Budget Summary
 - Evolution of the Plan
- Definitions
- Project Context
- Process Model
- Process Improvement
- Infrastructure and Enabling Systems
- Methods, Tools, and Techniques
- Product Acceptance
- Project Organization
 - General
 - External Interfaces
 - Internal Interfaces
 - Authorities and Responsibilities

2. Cemil Mert Özdemir

- Product Delivery
- Supporting Processes
 - General
 - Project Supervision and Work Environment
 - Decision Management
 - Risk Management
 - Configuration Management
 - Information Management
 - General
 - Project Information Management
 - Communication and Publicity
 - Quality Assurance
 - Measurement
 - Reviews and Audits

- Verification and Validation
- Additional Plans
- End Matter

3. Esad İsmail Tök

- Front Matter
- Project Summary
 - Project Deliverables
 - Schedule and Budget Summary
- Definitions
- Project Planning
 - General
 - Project Initiation
 - General
 - Estimation
 - Staffing
 - Resource Acquisition
 - Project Staff Training
 - Project Work Plans
 - General
 - Work Activities
 - Schedule Allocation
 - Resource Allocation
 - Budget Allocation
 - Procurement
 - Disposal
- Project Assessment and Control
 - General
 - Requirements Management
 - Scope Change Control
 - Schedule Control
 - Budget Control
 - Quality Assurance
 - Subcontractor Management
 - Project Closeout
- End Matter

4. Elifnur Alsaç

- Project Assessment and Control
 - General
 - Requirements Management

- Scope Change Control
- Schedule Control
- Budget Control
- Quality Assurance
- Subcontractor Management
- Project Closeout