SWE 387

Software Project Management Plan (SPMP)

The document in this file is an annotated outline for specifying Software Project Management Plan, adapted from the IEEE Standard for Software Project Management Plans (Std 1058-1998) and from other online resources.

Tailor this to your needs, removing explanatory comments as you go along. Where you decide to omit a section, you might keep the header, but insert a comment saying why you omit the data.

Project Plan
for
Dental System

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version 1

19/10/2024

Document History and Distribution

1. Revision History

Revision #	Revision Date	Description of Change	Author
1.0	10/10/2024	Initial Document	All team members
1.1	19/10/2024	Added sections 1,2,3	All team members
1.2	27/11/2024	Added sections 4 & 5.1 to 5.4 & 5.9	All team members
1.3	14/12/2024	Added sections 5.5, 5.6, 5.7, 5.8 & 5.8.1	All team members

1.

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1. Overview

This project aims to provide a web-based Dental System specifically designed for the KFUPM community, including students and faculty members. The project will deliver a new product specifically tailored for KFUPM's needs. The system will allow users to easily book dental appointments online, access their dental records, and receive automatic reminders for upcoming visits. By streamlining the scheduling process and providing users with instant access to their dental history, the platform eliminates the need for traditional paper-based systems and manual appointment handling. Additionally, the system will improve the overall dental health management for the KFUPM community by offering a more efficient and accessible way to track dental health, thus enhancing the healthcare experience at KFUPM.

2. Goals and Scope

2.1 Project Goals

- **Offers a reliable and excellent system** that is constantly available for scheduling patient visits, billing, and dental supplies.
- **Improve the oral health of students** by making dental care more easily available and effective through the Dental System
- **Improves dental staff productivity** by improving patient and medical record management.
- **Ensure timely and accurate processing of financial transactions** within the dental services by streamlining the processes for patient billing, payments, and invoicing.
- **enhance accessibility and user experience** by offering an interface that is tailored for different user roles, including administrators, staff, and patients, and available in both Arabic and English languages.
- **Enforce strict data protection and user authorization protocols**, integrated with the KFUPM authentication system

2.2 Project Scope

2.2.1 Included

- Development of a reliable scheduling system for patient visits, billing, and inventory management.
- Implementation of a Dental System aimed at improving oral health accessibility and effectiveness.
- Enhancement of dental staff productivity through improved patient and medical record management.
- Streamlining financial transactions related to dental services.
- Creation of a user-friendly interface that accommodates different user roles and languages (Arabic and English).
- Integration of data protection and user authorization protocols with the KFUPM authentication system.

2.2.2 Excluded

- Training of End-Users: The project will not include training sessions for end-users, even though this may be expected by the customer.

- Integration with External Systems: Any integration with external healthcare systems is outside the project scope unless explicitly stated.

2.3 References

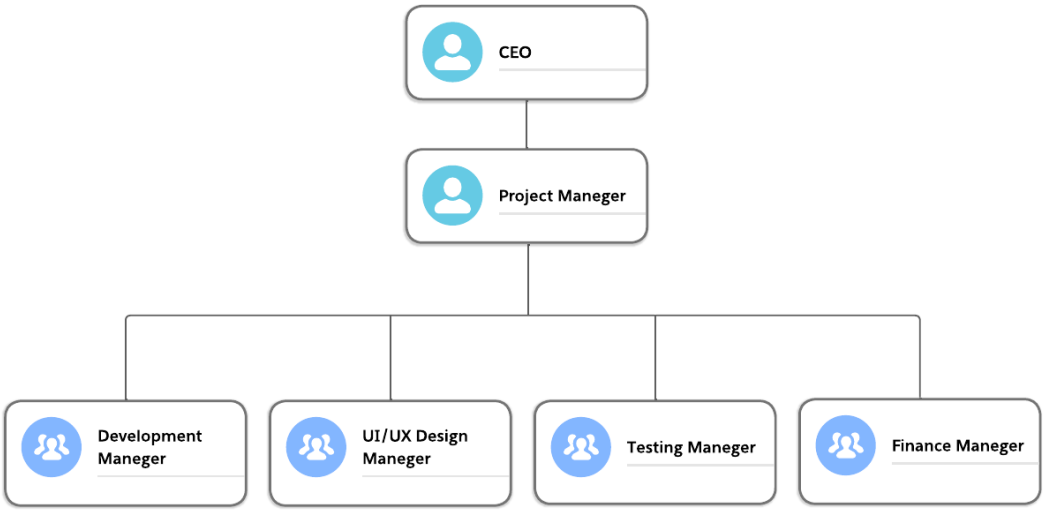
- Project Guidelines 241 SWE387.

3. Organization

3.1 Organizational Boundaries and Interfaces

1. **KFUPM (Parent Organization)**
   KFUPM provides overall governance and resources for the project. The **Project Manager** is responsible for reporting to KFUPM's administration, ensuring the project aligns with the university's policies and goals. Administrative decisions related to budget, timelines, and major changes in the project scope will be approved by KFUPM. Regular updates are shared with the university leadership to ensure that the project remains on track.
2. **KFUPM Health Services (Customer Organization)**
   The **Development Manager** coordinates with KFUPM Health Services, the primary user of the system, to gather functional requirements and feedback. While the health services staff provides input on system features (such as patient records, appointments, and billing), managerial decisions, including implementation and timelines, are handled by the project team. Health Services will also be involved in testing the system under the guidance of the **Testing Manager** to ensure it meets their operational needs.
3. **Subcontracted Organizations**
   If external subcontractors are involved, such as for specific technical components (e.g., pharmacy management or data backup), the **Project Manager** will oversee their contracts and ensure their deliverables meet KFUPM's standards. Subcontractors are responsible for adhering to the project's technical requirements and timelines but do not directly influence core project management decisions. Integration of subcontracted components into the main system will be handled by the **Development Manager**.
4. **KFUPM IT Department**
   The **Project Manager** works with the KFUPM IT department to ensure that the system integrates seamlessly with existing infrastructure, especially the university's authentication and security systems. The IT department provides technical oversight regarding compatibility and security, but overall project development decisions remain with the project team.
5. **Project Development Team**
   - **Project Manager**: Oversees the entire project, ensuring that all teams meet deadlines and that communication flows between all stakeholders.
   - **Development Manager**: Manages the technical development of the system, coordinating closely with the **UI/UX Design Manager** to ensure the system's functionality aligns with the user interface.
   - **UI/UX Design Manager**: Oversees the design of user interfaces, ensuring ease of use for patients, staff, and administrators, with both Arabic and English language options.
   - **Testing Manager**: Manages the system testing phase, ensuring that all components are functional and meet the requirements provided by Health Services. Testing involves both the internal team and end-users for feedback.
   - **Finance Manager:** The Finance Manager ensures that the project stays within budget and manages financial reports and expenses. They work closely with the Project Manager to make decisions on resource allocation and financial planning**.**

3.2 Project Organization



3.2.1 Project Team

Team member	Role	Comment
Zahra Alhadab	UI - UX Design Manager	
Renad Alqahtani	Development Manager	
Wala Aljobran	Testing Manager	
Sadeem Alotaibi	Finance Manager	
Reyouf Albogomi	Project Manager	

4. Schedule and Budget

4.1 Schedule and Milestones

We used Microsoft Excel Project to develop a detailed project schedule, available on the first sheet of the link provided. This schedule includes all five process groups, highlighting their respective activities and their sequential order through a Gantt Chart. It also integrates the project's Work Breakdown Structure (WBS).

The schedule provides comprehensive details, including activity durations, start and finish dates, and assigned resources. Key dates and events are prominently identified and marked as milestones to ensure clarity and effective tracking throughout the project timeline.

Schedule-Cost-Budget.ods

4.2 Cost Estimation

3 point estimate: Schedule-Cost-Budget.ods

4.2.1 Budget

Budget: Schedule-Cost-Budget.ods

4.3 Development Process

The development process applied in this project follows a structured and systematic approach to ensure efficiency, quality, and alignment with project objectives. This process was carefully selected based on the nature, complexity, and requirements of the project.

Development Process Overview

The chosen development process includes the following stages:

1. Initiation: Defining the project's scope, objectives, and feasibility. This phase ensures that all stakeholders have a clear understanding of the project's goals.
2. Planning: Creating detailed schedules, budgets, resource plans, and risk assessments. Tools such as the Work Breakdown Structure (WBS) and Gantt charts have been used for precise activity sequencing and scheduling.
3. Execution: Implementing planned activities, managing resources, and ensuring deliverables meet predefined standards.
4. Monitoring and Controlling: Regularly tracking progress, addressing issues, and adjusting plans as necessary to keep the project on track.
5. Closure: Finalizing all activities, delivering outcomes, and obtaining stakeholder approval to close the project.

Why This Process Was Selected

This development process was chosen because:

- It ensures comprehensive planning and resource allocation, reducing risks and uncertainties.
- The use of iterative stages allows for monitoring progress and making adjustments as needed.
- The inclusion of clear milestones ensures effective tracking of deliverables and critical deadlines.
- It aligns well with the project's scope and complexity, enabling efficient coordination among team members and stakeholders.

5. Management Plans

5.1 Integration Management

5.1.1 Configuration Management Plan

- Configuration management tools:
  For the Dental System project, we will use **GitHub** to manage and track source code changes, ensuring everyone works on the latest version. **Google Drive** will store all project documents, such as requirements and designs, with version history to track updates. **Notion** will be used to manage tasks, track changes, and organize project workflows. These tools will help us streamline collaboration and maintain control over the project.

- Configuration Identification Management: We will assign unique identifiers to all configuration items. These identifiers ensure that items are easy to track and reference. Key milestones, like finalizing requirements or completing designs, will be treated as baselines to ensure alignment throughout the project.
  Here is an example of the unique identifier:

Document Identifier	Document V1.1

Project Name	Dental System
Document Title	Project Procurement Plan
Date of Document	1/1/2025
Project Manager	Reyouf Albogomi

- Configuration Control: Changes to configuration items will follow a formal process. Any team member can submit a change request through Notion:
  - Including a description of the change with justification.
  - Inform and discuss changers with the project team.
  - Inform and discuss changers with the stakeholders.
  - The Project Manager will approve changes before implementation.
  - Approved updates will be reflected in GitHub for code and Google Drive for documents.

- Configuration Release Management: For each release, and after the changes approved, we will prepare approved system forms and updated documents, and release notes explaining changes and fixes. Before anything, all releases will go under testing process to ensure functionality and stability and to evaluate possible risks. Then, we will start the work only if the changes are can be controlled

5.1.2 Change management plan

The Change Management Plan ensures all changes are reviewed, approved, and implemented smoothly. Change requests can be submitted via Notion (as if in the form shown below). The Project Manager reviews requests, while major changes require Stakeholder Committee approval. Approved changes are tracked in a Change Request Log and communicated to the team. Regular reviews ensure changes meet the project goals.

Change Request Form:

ID	Item	Request	Investigator	Impact	Project Manager
Req#1	SRS	Add new feature	System Analyst	Additional development time	Reyouf Albogomi

5.1.3 Delivery Plan

#	**Deliverable**	**Planned Date**	**Receiver**
D1	Project Charter	1/11/2024	Project Stakeholders
D2	Scope Statement	6/11/2024	Project Team and Stakeholders
D3	Project Schedule	2/12/2024	**Project Manager and Team Members**
D4	Cost Plan	14/12/2024	Project Sponsor
D5	Quality Plan	28/12/2024	**Quality Team**
D6	Resource Plan	30/11/2024	**Project Manager and HR Team**
D7	SRS	22/11/2024	**Development Team and Stakeholders**
D8	Procurement Plan	27/11/2024	**Procurement Team**

#	Deliverable	Planned Date	Receiver
D9	Communication Plan	6/12/2024	Project Team and Stakeholders
D10	Project Management Plan	27/12/2024	**Stakeholders and Project Manager**
D11	Final Product	31/5/2025	End Users

5.2 Scope Management Plan

Authority and Responsibility:
The authority and responsibility for scope management rest with the Project Manager. The Project Manager shall oversee all aspects of scope management to ensure that the project remains within its defined objectives. The Project Team shall assist the Project Manager by providing input on scope-related decisions and helping to maintain clarity regarding project boundaries.

Scope Definition:
Project scope will be defined through the following components:

Scope Statement-a formal document that details, in writing, objectives of deliverables and boundaries regarding the project. It will also detail what is to be included in the project and what is to be excluded.

- Work Breakdown Structure (WBS): A hierarchical decomposition of the total scope of work into manageable sections; it will, therefore, enable tracking and management of the tasks of the project.

-WBS Dictionary Full explanation of each component shown on the WBS for both deliverables, activities along scheduling data.

-Statement of Work Description: Formal document describing Project scope, objectives along work to be delivered.

Scope Change Process:
The scope change shall play a vital role in order to make effective management of Project Scope: It shall contain all or a number of the following items

- Initiation: A proposed change can be suggested by any member of the team or stakeholders or the Project Manager himself. The proposed change shall be in writing and forwarded for processing.

- Authorization: All the requests for change shall be reviewed by the Project Manager. Changes in scope must be approved by all key stakeholders involved, including the Project Team and representatives from KFUPM Health Services.

- Tracking and Monitoring: Approved changes will be documented in the project management system, providing visibility and sharing. The Project Manager will then observe the effects of changes regarding the project timeline and/or resources.

Responsibility for Acceptance:
The acceptance of the final deliverables shall be performed by the Project Manager and the Testing Manager, ensuring that the deliverables meet predefined acceptance criteria as defined in the Scope Statement. Formal documentation of the acceptance of the project scope shall be carried out, while the sign-off by KFUPM Health Services is necessary to confirm that the project has met its objectives.

5.3 Schedule Management Plan

Microsoft Project will be used to create the project schedule, also the WBS, milestones, and Gantt chart. The tool provides excellent ability to track progress, manage dependencies, and ensure the timely completion of tasks and milestones.

Throughout the project, the Work Breakdown Structure will be developing and maintained by the Development Manager, Renad Alqahtani, and the UI/UX Design Manager, Zahra Alhadab. They will work closely with the team to ensure that all activities are accurately scheduled, and progress is updated regularly and provide to the project manager Reyouf albogomi regular updates.
Our project includes four deliverable phases. Each phase represents 25% of the total project work.
The Project Manager Reyouf albogomi can make changes to the schedule as she sees fits for the success of the project.

5.4 Cost Management Plan

The Cost Management Plan outlines the framework for managing project costs throughout the lifecycle of the Dental System project.

Cost Management Responsibilities
- The Project Manager, Reyouf Albogomi, is responsible for overseeing and managing all project costs. She will ensure that expenditures align with the budget established at the project's outset.

Authority for Budget Changes
- Any modifications to the project budget must be approved by the KFUPM administration. This approval will only occur after discussions with the Project Manager and the Finance Manager, Sadeem Alotaibi, to assess the impact on the project's financial health.

Cost Performance Measurement
- Cost performance will be quantitatively measured and reported on a monthly basis. The Project Manager will review budget adherence and variance analysis at the start of each month, comparing actual expenditures against the planned budget. Regular financial reports will be shared with stakeholders to ensure transparency and accountability in financial management.

5.5 This structured approach will facilitate effective cost control and ensure the successful delivery of the Dental System project within budget constraints.Quality Management Plan

❖ 5.5.1 Introduction:

The Quality Management Plan (QMP) is essential for ensuring that all deliverables of the Dental System project meet established standards of quality. This section outlines the roles and responsibilities, quality control, quality assurance, and quality monitoring processes to be implemented.

❖ 5.5.2 Quality Roles and Responsibilities:

5.2.1 Project Manager:

- **Overall Responsibility**: The Project Manager (Reyouf Albogomi) oversees the entire quality management process, ensuring standards are met.
- **Decision Authority**: Approves quality standards and addresses quality-related issues.

5.5.2.2 Quality Assurance Manager:
Role: Ensures adherence to quality standards throughout the project.
Responsibilities:
Develops quality assurance policies.
Conducts team training on quality standards.
Monitors compliance with industry regulations.

5.5.2.3 Quality Control Team:
Role: Responsible for inspecting and testing deliverables.
Responsibilities:
Conduct regular inspections and document findings.
Implement corrective actions for non-compliance.

- **5.5.3 Quality Control (QC):**

Quality Control focuses on verifying that deliverables meet quality standards through various techniques:

5.5.3.1 Inspection and Testing:
Deliverable Inspections: Each deliverable will undergo rigorous inspections.
Testing Procedures: Includes unit, integration, system, and user acceptance testing (UAT).

5.5.3.2 Performance Metrics:
KPIs: Establish metrics such as defect rates and user satisfaction to measure quality.
Regular Reporting: Weekly reports on quality metrics to track progress.
5.5.3.3 Non-Conformance Management:
Non-Conformance Reports (NCRs): Document issues and outline corrective actions.
Corrective Actions: Promptly implement measures to resolve identified quality issues.

- **5.5.4 Quality Assurance (QA)*:***

Quality Assurance ensures processes are in place for consistently producing quality deliverables:

5.5.4.1 Process Documentation:
Standard Operating Procedures (SOPs): Maintain SOPs for all critical processes.
Quality Standards: Adhere to relevant quality standards, such as ISO 9001.

5.5.4.2 Training and Development:
Quality Training: Provide training sessions on quality management principles.
Continuous Improvement: Foster a culture of improvement where feedback is encouraged.

5.5.4.3 Audits and Reviews:
Quality Audits: Conduct regular audits to assess compliance with quality processes.
Management Reviews: Schedule periodic reviews with stakeholders to evaluate quality performance.

- **5.5.5 Quality Monitoring:**

Quality Monitoring involves ongoing assessments to ensure adherence to standards:

5.5.5.1 Continuous Monitoring:
Real-Time Monitoring Tools: Utilize tools to track quality metrics continuously.
Feedback Loop: Encourage real-time reporting of quality issues by team members.

5.5.5.2 Stakeholder Involvement:
User Feedback: Actively collect feedback from end-users during UAT.
Stakeholder Reviews: Regularly engage stakeholders in quality reviews.

5.5.5.3 Reporting and Documentation:
Quality Reports: Summarize findings from inspections and testing in comprehensive reports.
Documentation Repository: Maintain a centralized repository for all quality-related documentation.

❖ 5.5.6 Conclusion:

The implementation of this Quality Management Plan will ensure that the Dental System project meets established quality standards, aligning with stakeholder expectations and regulatory requirements. By defining roles, establishing systematic quality control and assurance processes, and ensuring continuous monitoring, the project aims to deliver a high-quality system for the KFUPM community.

5.6 Staffing Management Plan

Staffing Plan:

To effectively execute the Dental System project, it is crucial to establish clear goals and ensure that all resources are aligned with these objectives. Regular updates and communication regarding any changes will be essential to maintain team cohesion and focus. Additionally, we must consider factors impacting personnel availability, such as vacations, emergencies, and illnesses. Conducting a gap analysis will help identify any discrepancies between our current resources and the requirements, particularly during peak demand periods.

Key Resources Needed

Resource	*Role*	*Duration Required*	*Time Period*
Software Designer	*Full-time*	*276 days*	*April 2024 to May 2025*
Project/People Manage	*Full-time*	*276 days*	*April 2024 to May 2025*
Document Controller	*Full-time*	*276 days*	*April 2024 to May 2025*
Software Developer	*Full-time*	*276 days*	*April 2024 to May 2025*
Develop	*Full-time*	*276 days*	*April 2024 to May 2025*
UX/UI Designer	*Full-time*	*276 days*	*April 2024 to May 2025*
Business Analyst	*Full-time*	*276 days*	*April 2024 to May 2025*

Equipment Requirements

Computers:

- *7 PCs supporting Windows 10*
- *2 Apple iMacs*

Network:

- *Internet network access*

Software Tools:

- *IntelliJ IDEA*
- *Jira*
- *Jenkins*
- *Confluence*
- *Slack*

5.7 Communication Management Plan

- The report will be made every week, at least once between stakeholders.
- The main goal is to give stakeholders enough information so they can be informed and can give their appropriate decisions, and communication with stakeholders may be good news or bad news.
- There are three basic meetings. The first one takes the requirements and signs the contract, the second to follow up on the work, and the third before handing over the project.
- Meetings will be monthly.
- The official means of communication between the organization and the client organization is e-mail, and in the case of a meeting, it will be at the company's headquarters.

Communication Table

Communication Type	Description	Frequency	Format	Participants/ Distribution	Deliverable	Owner
Status Report	Email to describe where the project stands	Monthly	In-person	Project Sponsor	Status Report	Reyouf Albogomi
Progress Report	Describe what the project has accomplished	Weekly	Email	Project stakeholders	Progress Report	Renad Alqahtani
Forecasts	Predicting the status of the project	Monthly	In-person	Project Sponsor, Stakeholders	Forecasts Report	Sadeem Alotaibi
Project Review	Present metrics and status to the team and	Monthly	In-person	Project Sponsor, Team, and Stakeholders	Status and Metric Presentation	Reyouf Albogomi

	sponsor					
Project Team Meeting	Meeting to review the status of the project before presenting it to stakeholders	Weekly	In-person	Project Team	Report of outcomes	Wala Aljobran
Construction Status	Report outlining weekly progress and issues	Weekly	Email	Project Team	Construction Status Update	Renad Alqahtani

5.8 Risk Management

Risk management is a critical aspect of the Dental System project to ensure its success and sustainability. This section outlines the procedures and responsibilities associated with identifying, analyzing, mitigating, and monitoring risks throughout the project's lifecycle.

Risk Management Procedure:

1. **Risk Identification**

- Identify risks through team discussions, stakeholder input, and historical data.

2. **Risk Assessment**

    - Evaluate risks by likelihood and impact and prioritize them accordingly.

3. **Risk Mitigation**

    - Develop and implement mitigation strategies for high-priority risks.

4. **Risk Monitoring**

    - Regularly review and update the risk register to track and manage risks.

5. **Roles and Responsibilities**

    - **Project Manager**: Oversees risk management activities.
    - **Risk Officer**: Maintains the risk register.
    - **Project Team**: Identifies and mitigates risks during tasks.
    - **Stakeholders**: Provide input during risk reviews.

5.8.1 Risk Register

Risk ID	*Risk Description*	*Probability*	*Impact*	*Priority*	*Mitigation Strategy*
R1	*System downtime during peak usage*	*High*	*High*	*High*	*Implement a robust server infrastructure and perform load testing.*
R2	*Data breach or unauthorized access*	*Medium*	*High*	*High*	*Integrate KFUPM authentication system and enforce strict encryption*
R3	*Mismanagement of dental records*	*Medium*	*Medium*	*Medium*	*Train staff on proper data handling procedures.*
R4	*Delayed project delivery*	*Low*	*High*	*Medium*	*Conduct regular progress reviews and adjust timelines as needed.*
R5	*Language translation errors in the interface*	*Medium*	*Low*	*Low*	*Perform thorough user testing with Arabic and English users.*
R6	*Budget overrun*	*Medium*	*High*	*High*	*Monitor expenses and conduct regular budget reviews.*

5.9 Procurement Management Plan

5.9.1 Procurement Management

The Procurement Management Plan outlines the steps and responsibilities for managing procurement throughout the project lifecycle, from planning to completion. The process includes the following stages:

1. **Planning Procurement**
    - Identify project needs that require external procurement.
    - Conduct make-or-buy analyses to determine whether the resources should be acquired internally or externally.

    - Prepare detailed procurement requirements, including specifications, budgets, and timelines.
2. **Vendor Selection and Contracting**
    - Identify and evaluate potential vendors based on criteria such as cost, quality, and delivery timelines.
    - Issue Requests for Proposals (RFPs) or Requests for Quotations (RFQs) to shortlisted vendors.
    - Negotiate terms and finalize contracts with the selected vendor(s).
3. **Procurement Execution**
    - Monitor procurement activities to ensure timely delivery of goods and services.
    - Verify that procured items meet the specified requirements.
4. **Procurement Monitoring and Controlling**
    - Regularly review vendor performance against agreed-upon terms and address any discrepancies.
    - Resolve procurement-related issues as they arise.
5. **Procurement Closure**
    - Verify the completion of procurement deliverables.
    - Conduct a final review of vendor performance and close procurement contracts.

The project manager is responsible for overseeing procurement activities, ensuring compliance with the procurement plan, and coordinating with vendors. Team members are required to report any additional procurement needs during the project

5.9.2 Sub-contract Management

The following parts of the project have been outsourced to sub-contractors to ensure timely and cost-effective completion:

Work Item	Reason for Outsourcing
Web Hosting Services	Specialized expertise and scalability
Database System Development	Technical complexity requiring expertise
SSL Certification Implementation	Ensuring compliance with industry standards

The project manager will maintain communication with each sub-contractor to monitor progress and ensure that deliverables meet the project's specifications and deadlines. Regular progress updates and quality checks will be conducted to manage risks and resolve issues promptly.

6. Abbreviations and Definitions

CCB	Change Control Board
CM	Configuration Management

CR	Change Request