



SECJ2203: Software Engineering

System Documentation (SD)

**QMS-Flow - Integrated Quality Management System for
Avialite Sdn. Bhd.**

Version 2.0

4 January 2026

Faculty of Computing

Prepared by: Tech TiTan

Revision Page

a. Overview

This system documentation covers the introduction, system requirements, personas, system features, launch phase, user story details, performance and design constraints.

b. Target Audience

Avialite management, auditors, engineers and course instructors.

c. Project Team Members

Member Name	Role	Task	Status
Rasyid	Team Leader/Analyst	System Features and Launch Phase	Complete
Rafiq	Project Manager	Performance & Design Cons	Complete
Hazim	QA Engineer	Introduction	Complete
Afiq Shahir	Developer	User Story	Complete
Afiq Irfan	Developer	Persona	Complete

d. Version Control History

Version	Primary Author(s)	Description of Version	Date Completed
1.0	Muhammad Abdul Rasyid Bin Murad	Completed Chapter 1 & 2, Section 02	07/12/2025
2.0	Muhammad Afiq Irfan bin Zuraimi	Completed Section 3 until Section 7	4/1/2026

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1. Introduction

1.1 Purpose

This System Documentation (SD) / Software Requirements Specification (SRS) describes the functional and non-functional requirements, scope, interfaces, and constraints for **QMS-Flow, an Integrated Quality Management System** tailored for Avialite Sdn. Bhd. The purpose of this document is to provide a single, authoritative reference for stakeholders (Avialite management, engineers, and auditors), the development team (Tech TiTan), and course instructors to ensure that the system design and implementation satisfy the agreed requirements and meet ISO 9001:2015 compliance needs. Key deliverables defined by this document include the functional requirement set, user personas, use cases, performance and security requirements, and launch/sprint planning.

1.2 Scope

The QMS-Flow software product will be a web-based, centralized quality management platform that replaces manual and fragmented QMS processes at Avialite Sdn. Bhd. The system will:

- Provide centralized **Document Control** with versioning, metadata, approval workflows, and audit trails.
- Provide a **Traceability** capability linking customer complaints, CAPA records, training logs, and equipment calibration history.
- Support **CAPA (Corrective and Preventive Action)** lifecycle: create, assign, track, verify, and close CAPAs.
- Provide **Audit Management** tools: schedule audits, record findings, link findings to CAPAs, and track follow-ups.
- Manage **Training Records** and training assignments with completion tracking and linkage to CAPA or competence requirements.
- Manage **Equipment** registry and calibration schedules with alerts and history.

- Offer **Dashboards & KPI Reporting** for management oversight (CAPA closure rate, audit completion, training compliance, calibration status). Out of scope (initial release): full ERP/production control, manufacturing process automation, and third-party QMS vendor integrations beyond basic import/export (CSV/PDF) for legacy compatibility. The system is designed to integrate with Avialite's existing on-premise environment and preserve legacy workflows where possible to reduce disruption.

Primary benefits and objectives

- Improve document accuracy and prevent outdated SOP usage.
- Reduce compliance risk and speed corrective actions.
- Provide traceable audit evidence to support ISO 9001:2015 certification readiness.
- Increase operational visibility via real-time dashboards for management decision-making.

1.3 Definitions, Acronyms and Abbreviation

QMS	Quality Management System.
QMS-Flow	The name of the proposed Integrated Quality Management System for Avialite.
SOP	Standard Operating Procedure.
CAPA	Corrective and Preventive Action.
RBAC	Role-Based Access Control.
UAT	User Acceptance Testing

KPI	Key Performance Indicator.
RTO	Recovery Time Objective.
RPO	Recovery Point Objective.
ISO 9001:2015	International Standard for Quality Management Systems (clause references used throughout the design and requirements).

1.4 References

Primary source materials used to prepare this SRS:

- **Project 1 (Proposal)** - QMS-Flow Project Proposal (Tech TiTan / Avialite).
This proposal provides background, a problem statement, proposed modules (Document Control, Traceability, Audit Management, CAPA, Training, and Equipment), and the project schedule referenced for scope and priorities.
- **Project SE SRS Template** - SECJ2203 SRS/SD template and earlier SRS draft for QMS-Flow.
- **Project SE SDD Template** - SECJ2203 SDD/SD template and earlier SDD draft for QMS-Flow.
- External standards (informative): ISO 9001:2015 (documented information and performance evaluation clauses) - referenced in Requirements and Design Constraints sections.

1.5 Overview

This subsection should:

- a) *Describe what the rest of the SD contains;*
- b) *Explain how the SD is organized.*

Give an overview of the content of this SD document.

2. Specific Requirements

This section of the System Documentation (SD) explains the Software Requirements Specification (SRS) for the **QMS-Flow System**. It provides a clear and complete description of all system requirements to ensure that the design and development of the system meet the needs of Avialite Sdn. Bhd. The requirements help developers understand what the system must do, and they guide testers to check whether the system works correctly. These requirements cover both functional and non-functional parts of the system and support the main users, such as staff, supervisors, quality managers, and auditors.

This section also ensures that the system supports the goals of improving document control, tracking complaints, managing training, and ensuring ISO 9001:2015 compliance.

Key points in this section include:

1. Inputs and Outputs

- All inputs, such as user actions, uploaded documents, complaint reports, training updates, or calibration requests.
- All outputs such as notifications, approval status updates, complaint progress, training results, and calibration reminders.

2. System Function

- A breakdown of the main functions the system will perform, such as document approval, complaint handling, CAPA tracking, training management, and equipment calibration management
- These functions describe how the system responds to user inputs and how it produces results or updates.

3. User-Centric Requirement

- Requirements that can be seen or experienced by users such as staff, supervisors, QA managers, and auditors.
- This ensures the system is easy to use, clear, and helpful in daily work operations.

4. Compliance and Standards

- Requirements that help the system meet ISO 9001:2015 standards, including document control, traceability, audit trails, and proper record keeping.
- This ensures the system supports quality management and follows industry guidelines.

2.1 Persona

Different types of users with different roles and skills will use the QMS-Flow System. These include production engineer, admin, quality managers, and auditors. Most engineers have basic computer skills and need a simple system that they can understand easily. Admins and quality managers are more experienced users who require system features to plan documents, training, complaints, and equipment records. Auditors need to review information and check compliance. Analyzing these users with these different roles helps the development team design a system that matches their abilities to support their daily tasks. By knowing their needs, behavior, and challenges, the system can be made user-friendly, clear, and suitable for the work environment at Avialite Sdn. Bhd.

2.1.1 Persona 1 (Engineer)

The Engineer is central to maintaining ISO 9001-compliant operational records, daily registering new documents, updating equipment, tracking training, and initiating CAPA. Their simultaneous technical and documentation duties require a fast, accurate, and structured data entry system. To support productivity and compliance, the interface must be clear, consistent, and easy to use, minimizing complexity and manual errors.

2.1.1.1 Description

Name	Amir Hakim
Age	27
Role	Engineer (uses modules for Document Control, Training Records, CAPA, and Equipment Management)
Technical Skill	Moderate. Able to use computers for daily tasks, fill forms, upload files, and navigate structured modules. Not specialized in IT but learns new systems quickly.
Experience	3–5 years in engineering operations involving maintenance, production processes, and reporting non-conformances. Familiar with equipment handling, documentation, and safety compliance.
Motivations	Wants a fast and simple system to manage documents, track training status, update equipment records, and initiate CAPA without dealing with manual paperwork. Motivated by efficiency, compliance, and reducing repetitive manual tasks.
Goals	<ul style="list-style-type: none">• Maintain accurate equipment records and calibration dates.• Quickly initiate CAPA when problems arise.• Ensure training records for staff are updated and compliant.

Behaviours	<ul style="list-style-type: none"> • Upload documents immediately after preparing them. • checks equipment statuses regularly. • Follow clear system prompts and guided workflows.
Pain Points	<ul style="list-style-type: none"> • Hard to track which documents are the latest/approved version. • Equipment calibration dates are easily forgotten without notifications. • CAPA processes can be confusing if steps are not clearly guided.

2.1.1.2 User Need

The Engineer needs a streamlined interface to upload and manage documents with version control, a guided CAPA initiation linked to complaints, and equipment calibration scheduling and status tracking.

2.1.1.3 User Stories

1. As an Engineer,

I want to upload SOPs with version control so that documents are traceable and current.

2. As an Engineer,

I want to initiate CAPA linked to complaints so that corrective actions are properly tracked.

3. As an Engineer,

I want to manage equipment calibration schedules so that compliance is maintained.

2.1.2 Persona 2 (Manager)

The Manager oversees multi-departmental quality assurance, relying on accurate system data for informed decisions, approving documents, monitoring KPIs, and ensuring timely CAPA completion. Effective compliance evaluation requires real-time, up-to-date records and consistent document versions. The system's accuracy directly influences quality outcomes; thus, a structured, easily navigable system is vital for managerial oversight and maintaining ISO 9001 standards.

2.1.2.1 Description

Name	Farah Nadira
Age	35
Role	Quality Manager (oversees approvals, KPI monitoring, compliance, and CAPA oversight)
Technical Skill	Intermediate. Comfortable with dashboards, reports, approvals, and system navigation. Uses multiple QMS tools daily.
Experience	10–12 years in quality assurance, process improvement, audit preparation, and document control oversight.
Motivations	Wants accurate information for decision-making, smooth approval processes, and an organized system that reduces administrative workload.
Goals	<ul style="list-style-type: none">● Monitor KPIs in real time.● Ensure CAPA actions are completed on time.● Maintain compliance across engineering and production teams .
Behaviours	<ul style="list-style-type: none">● Reviews and approves documents promptly.● Cross-checks audit findings and assigns corrective actions.● Communicates with engineers about training & equipment

	status.
Pain Points	<ul style="list-style-type: none">• Overwhelmed by large volumes of documents awaiting approval.• Difficult to track CAPA progress without system reminders.• Manual coordination between departments leads to delays.

2.1.2.2 User Need

The Manager needs a dashboard to monitor KPIs across CAPA, audits, training, and equipment. They also need document approval workflows with clear status updates and training assignments and progress tracking tools.

2.1.2.3 User Stories

1. As a Manager,

I want to approve or reject documents so that only validated SOPs are published.

2. As a Manager,

I want to assign training to employees so that competency gaps are addressed.

3. As a Manager,

I want to generate KPI reports so that I can evaluate departmental performance.

2.1.3 Persona 3 (Admin)

The Admin maintains system integrity for documentation, training, and equipment tracking. Responsibilities include managing accounts, updating records, ensuring data accuracy, and providing technical support. Admins rely on clear, dependable workflows for system reliability, needing stability, precision, and efficient controls to keep information accurate, accessible, and compliant with ISO 9001. Inaccurate data or system issues severely impede their ability to maintain compliance-ready records.

2.1.3.1 Description

Name	Syed Tariq
Age	42
Role	System Administrator (manages system access, user accounts, and supports Traceability & CAPA module)
Technical Skill	Advanced. Skilled in system configuration, user management, troubleshooting, data validation, and maintaining digital records.
Experience	6–8 years in administrative and system management roles, familiar with QMS platforms, database maintenance, and digital workflows.
Motivations	wants a stable, error-free system that is easy to maintain. Motivated by minimizing user issues, ensuring data accuracy, and maintaining smooth system operations.
Goals	<ul style="list-style-type: none">● Manage user accounts and access permissions efficiently.● Ensure training and equipment records are accurate and updated.● Maintain system data integrity and prevent duplicate or incorrect entries.
Behaviours	<ul style="list-style-type: none">● Regularly updates training and equipment information.

	<ul style="list-style-type: none"> ● Monitors user activity for accuracy and compliance. ● Provides system support for staff who face technical issues.
Pain Points	<ul style="list-style-type: none"> ● High volume of update requests from engineers and managers. ● System downtime or lag affects administrative tasks. ● Difficulty managing large numbers of document or record changes during audit periods.

2.1.3.2 User Need

The Admin requires centralized training record management, CAPA assignment and progress tracking, and integration with audit and equipment modules.

2.1.3.3 User Stories

1. As an Admin,

I want to manage training records so that employee competencies are documented and updated.

2. As an Admin,

I want to monitor CAPA progress so that corrective actions are completed and traceable.

2.1.4 Persona 4 (Auditor)

The Auditor is tasked with verifying the company's adherence to ISO 9001 requirements. Performing audits on a periodic basis (monthly, quarterly, or annually), their work hinges on accessing accurate, complete, and traceable documentation. They focus specifically on validating calibration and training records, assessing CAPA effectiveness, and scrutinizing overall paperwork quality. Consequently, the integrity and accuracy of system-generated documents are critical to their function.

2.1.4.1 Description

Name	Yi wen
Age	48
Role	Internal / External Quality Auditor
Technical Skill	High experience with digital QMS platforms, audit software, and compliance tools
Experience	More than 20 years performing internal and external audits in manufacturing and service sectors
Motivations	Responsible for reviewing whether the organization conforms with ISO 9001 requirements, performs scheduled audits and evaluates paperwork related to complaints , investigations, corrective actions (CAPA), calibration, training records, and management review outputs.
Goals	<ul style="list-style-type: none">• Review complaint and CAPA history with complete traceability• Before closing, confirm the effectiveness of the corrective measures.• Check that training, calibration, and management evaluations are appropriately documented• Detect gaps or unsafe practices early
Behaviours	<ul style="list-style-type: none">• Uses the system during monthly, quarterly, or yearly audits

	<ul style="list-style-type: none"> ● reviews CAPA timelines, evidence, and efficacy tests in-depth. ● Communicates follow-up remedial actions to the Quality Manager ● Cross-checks inquiry notes and attached documents
Pain Points	<ul style="list-style-type: none"> ● Records are often incomplete or stored in multiple places ● Hard to verify effectiveness when evidence is missing ● Calibration and training records are sometimes outdated

2.1.4.2 User Need

The auditor needs tools to schedule audits with scope and reminders, Forms to record findings and trigger CAPA if needed, and Access to complete CAPA and training for verification.

2.1.4.3 User Stories

1. As an Auditor,

I want to schedule internal and external audits so that compliance checks are planned and resources are allocated. (This traces to UC003: Schedule Audit)

2. As an Auditor,

I want to record audit findings and non-conformances so that CAPAs can be officially initiated. (This traces to UC004: Record Audit Findings)

2.2 System Features

QMS-Flow is designed as a hybrid Quality Management System (QMS) platform that integrates seamlessly into Avialite Sdn. Bhd.'s legacy workflows while replacing manual, fragmented processes with a centralized and automated solution. The system provides a closed-loop compliance cycle aligned with ISO 9001:2015 standards, ensuring that document control, traceability, CAPA, audits and management review are unified in one environment. The system features are illustrated in Figure 2.2.1 below. The detailed description of each module and function is tabulated in Table 2.2.1.

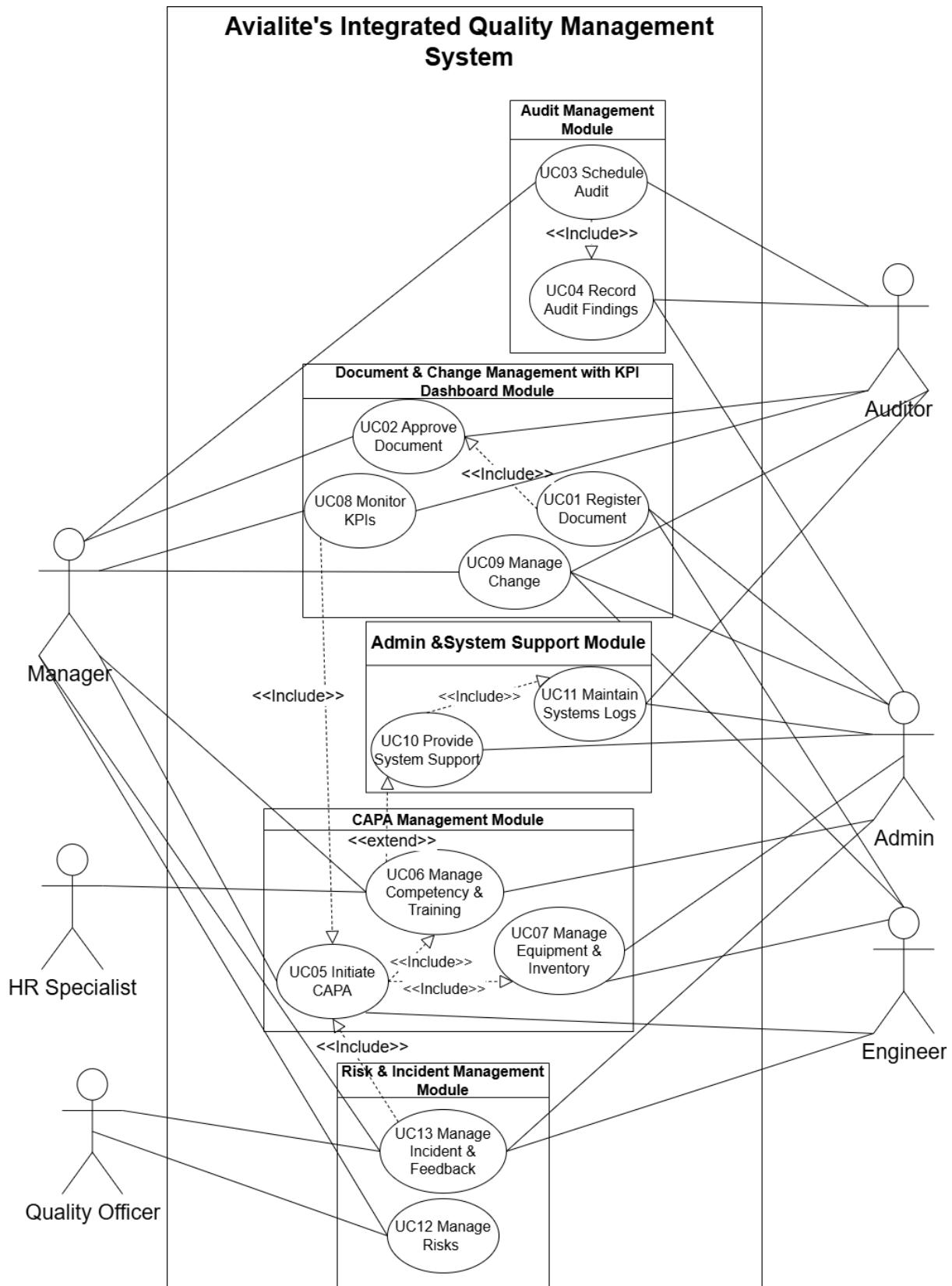


Figure 2.2.1: Use Case Diagram for QMS-FLow

Table 2.2.1 : Description of Module and Functions for Integrated Quality Management System

Use Case	Function	Description
UC01	Register Document	Allows users to create and submit new documents into the system for review.
UC02	Approve Document	Enables managers or auditors to approve submitted documents, triggering version control and publication.
UC03	Schedule Audit	Plan and assign internal audits with dates and scope.
UC04	Record Audit Findings	Allows auditors to log findings during an audit, including observations and nonconformities.
UC05	Initiate CAPA	Starts corrective or preventive actions based on audit findings, incidents, or complaints.
UC06	Manage Competency & Training	Assesses staff skills and schedules training to close competency gaps
UC07	Manage Equipment & inventory	Tracks calibration, maintenance, and equipment readiness linked to CAPA.
UC08	Monitor KPIs	Enables managers to view and analyze key performance indicators related to quality objectives.
UC09	Manage Change	Handles change requests, reviews, and approvals to maintain controlled updates in processes or documents.
UC10	Provide System Support	Enables admins to respond to client or staff support requests, including technical issues or access problems.
UC11	Maintain System Logs	Automatically records system activities for traceability, including logins, approvals, and changes.
UC12	Manage Risks	Identify, assess, and mitigate risks that may impact quality or compliance.
UC13	Manage Incident & Feedback	Handle report incidents or customer complaints and track investigations and resolutions.

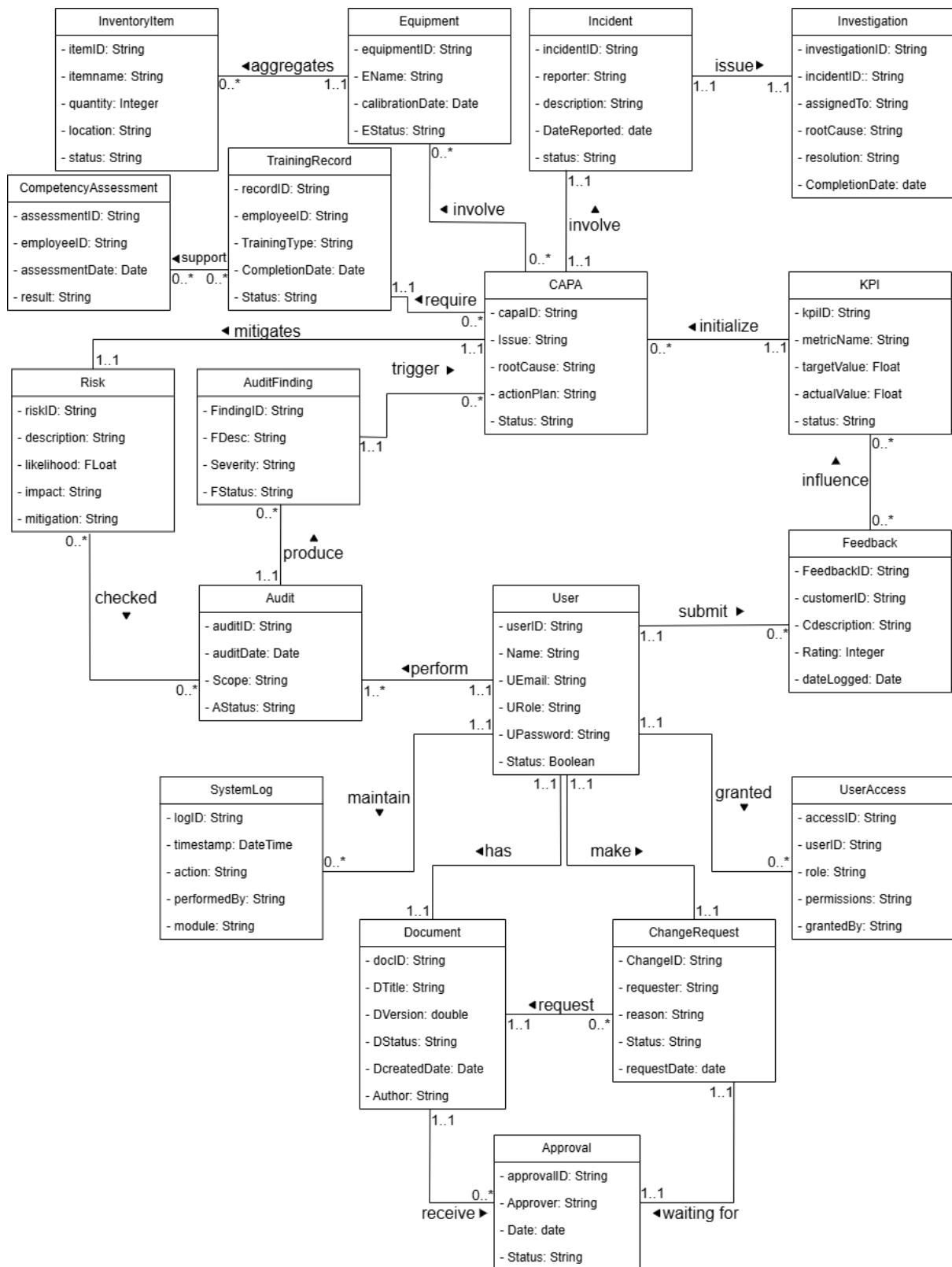


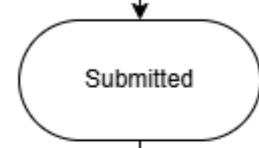
Figure 2.2.2: Domain Model for QMS-Flow



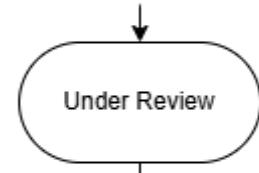
Register Document



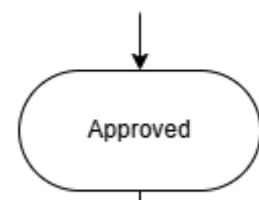
Save Document



[Reviewer assigned]/ Lock document for review



Approve or Reject/ Update status to Approved or Rejected.



Archive document [if obsolete or replaced]/ Move to archive repository

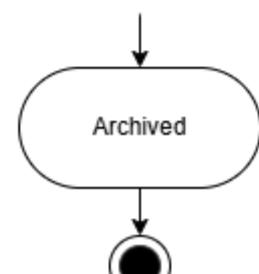


Figure X.X: State Machine Diagram for Module

2.3 Launch Phase

Sprint	User Story	Team Member Assigned
Sprint #1 UC001 (Register Document) and UC002 (Approve Document) [Document Control Module]	As an engineer, I want to upload documents with version control so that SOPs are traceable.	Rasyid, Afiq Shahir
	As a manager, I want to approve and reject documents so that only valid SOPs are published.	
Sprint #2 UC005 (Initiate CAPA) and UC006 (Manage Training Record) [Traceability and CAPA Management Module]	As an engineer, I want to initiate CAPA linked to complaints so that corrective actions are tracked.	Afiq Irfan, Hazim
	As a manager, I want to assign training to employees so that competency gaps are addressed.	
Sprint #3 UC003 (Schedule Audit) and UC004 (Record Audit Findings) [Audit Management Module]	As an auditor, I want to schedule audits so that compliance checks are planned.	Rafiq, Hazim
	As an auditor, I want to record audit findings so that CAPAs can be initiated.	
Sprint #4 UC007 (Manage Equipment) and UC008 (Monitor KPIs) [Traceability, CAPA, and KPIs Management Module.]	As an engineer, I want to record equipment calibration schedules so that compliance is maintained.	Rasyid, Afiq Shahir

2.4 User Story Details

2.4.1 US001: User Story Register Document

Table 2.1: User Story Description for Register Document

User story: UC001 - Register Document
ID: US001
User Story Description As an Engineer I want to upload SOPs with version control So that documents are traceable and current
Flow of events: <ol style="list-style-type: none">1. Engineer selects “Upload Document”2. System prompts for metadata3. Engineer uploads file4. System assigns Document ID and version5. Document stored as Draft
Alternative flow : Invalid file format → error message Repository unavailable → error logged and notify admin
Acceptance Criteria Precondition: Engineer logged in Postcondition: Document stored with metadata and status = Draft
Exception flow: File exceed size limit: upload rejected, user prompted to retry

Figure 2.4.1.1: Sequence Diagram for Register Document

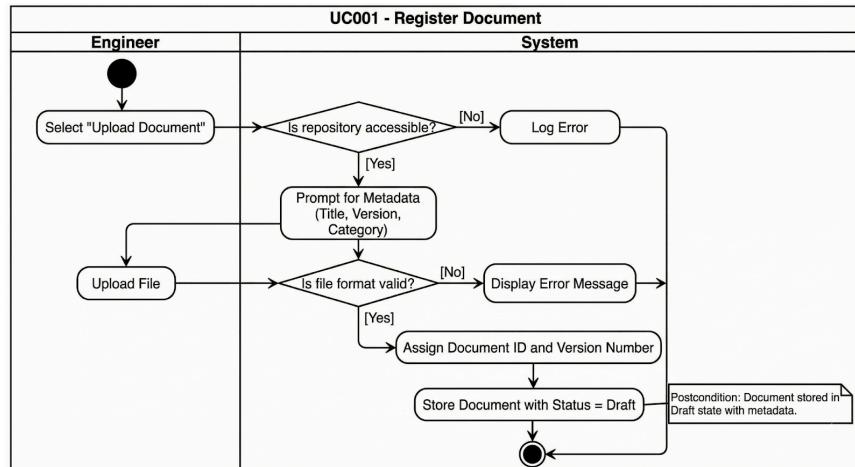


Figure 2.4.1.2: Activity Diagram for Register Document

2.4.2 US002: User Story Approve Document

Table 2.4.2.1: User Story Description for Approve Document

User story: UC002 - Approve Document	
ID: US002	
User Story Description	
As a Manager I want to approve or reject documents So that only validated SOPs are published.	
Flow of events: <ol style="list-style-type: none"> Manager review document Manager selects approve or reject System updates status 	
Alternative flow n: Document rejected: returned to draft with reviewer comments	
Acceptance Criteria Precondition: Document status = pendingApproval Postcondition: Status updated to Approved or Draft	
Exception flow: Approval right missing: system denies access Document locked by another reviewer: approval deferred	

Figure 2.4.2.1: Sequence Diagram for Approve Document

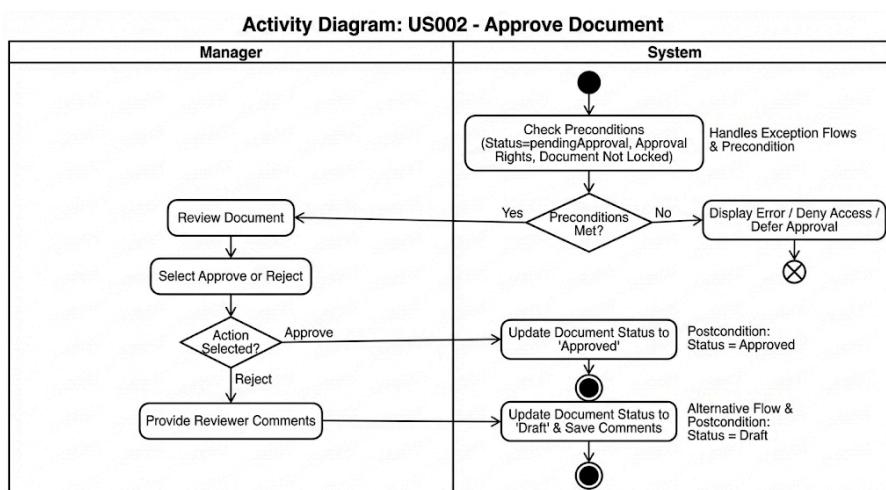


Figure 2.4.2.2: Activity Diagram for Approve Document

2.4.3 US003: User Story Schedule Audit

Table 2.4.3.1: User Story Description for Schedule Audit

User story: UC003 - Schedule Audit
ID: US003
User Story Description
As an Auditor I want to schedule internal and external audits So that compliance checks are planned and resources are allocated
Flow of events: <ol style="list-style-type: none">1. Auditor selects “Schedule Audit”2. System prompts for date, scope, auditor3. Auditor enter details4. System creates audit record
Alternative flow n:
Acceptance Criteria Precondition: Auditor logged in Postcondition: Audit scheduled and visible in calendar with assigned auditor notified
Exception flow: Calendar service down: scheduling fails, error logged Duplicate audit entry: system prompts for confirmation

Figure 2.4.3.1: Sequence Diagram for Schedule Audit

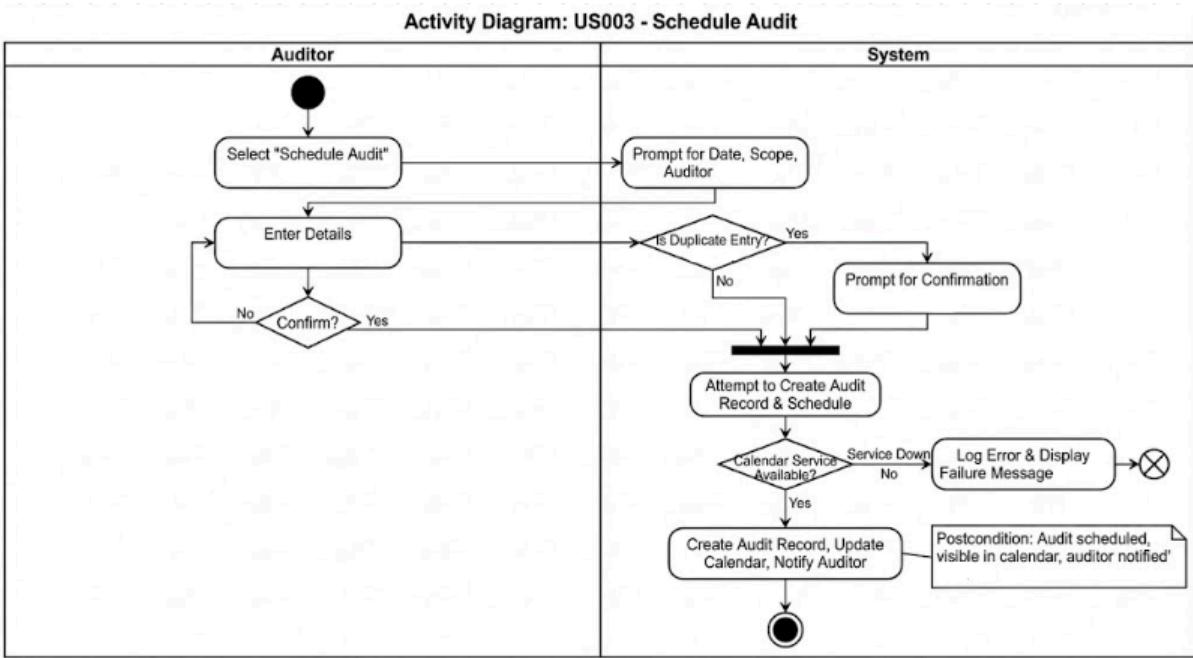


Figure 2.4.3.2: Activity Diagram for Schedule Audit

2.4.4 US004: User Story Record Audit Findings

Table 2.4.4.1: User Story Description for Record Audit Findings

User story: UC004 - Record Audit Findings
ID: US004
User Story Description As an Auditor I want to record audit findings and non-conformances So that observation and nonconformities are documented for compliance
Flow of events: <ol style="list-style-type: none">1. Auditor records audit findings2. System prompts for observations, evidence, and nonconformities3. Auditor enters findings and attaches supporting files4. System stores findings linked to audit ID
Alternative flow n: Incomplete entry → system requests missing details.
Acceptance Criteria Precondition: Auditor logged in; audit session completed Postcondition: Audit findings recorded and accessible for CAPA or reporting
Exception flow: File upload fails: retry required

Figure 2.4.4.1: Sequence Diagram for Record Audit Findings

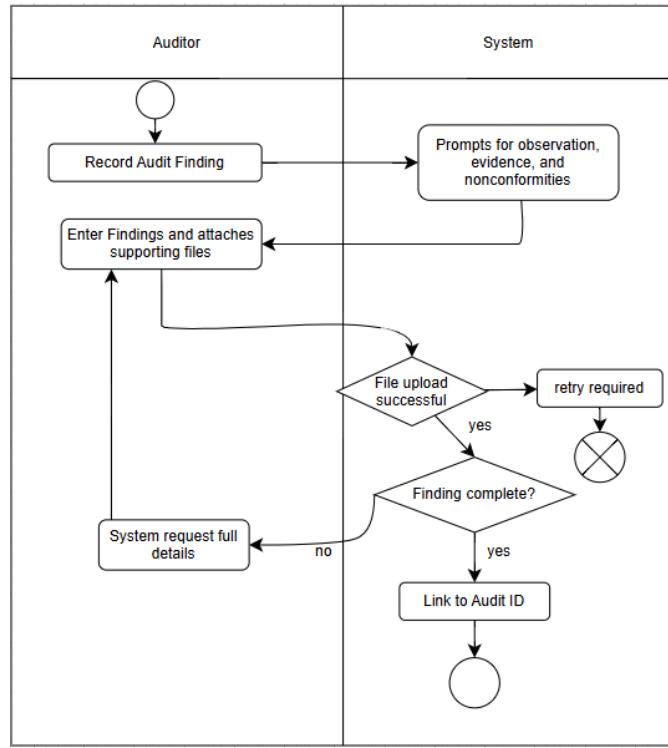


Figure 2.4.4.2: Activity Diagram for Record Audit Findings

2.4.5 US005: User Story Initiate CAPA

Table 2.4.5.1: User Story Description for Initiate CAPA

User story: UC005 - Initiate CAPA
ID: US005
User Story Description
As an Engineer I want to initiate CAPA linked to complaints So that corrective actions are properly tracked
Flow of events: <ol style="list-style-type: none">1. Engineer selects “Initiate CAPA”2. System prompts for root cause and action3. Engineer enters details4. System assigns CAPA ID
Alternative flow n: Duplicate CAPA detected: system warn and request conformation
Acceptance Criteria Precondition: Complaint logged Postcondition: CAPA record created and linked to complaint
Exception flow: Missing complaint ID → error message

Figure 2.4.5.1: Sequence Diagram for Initiate CAPA

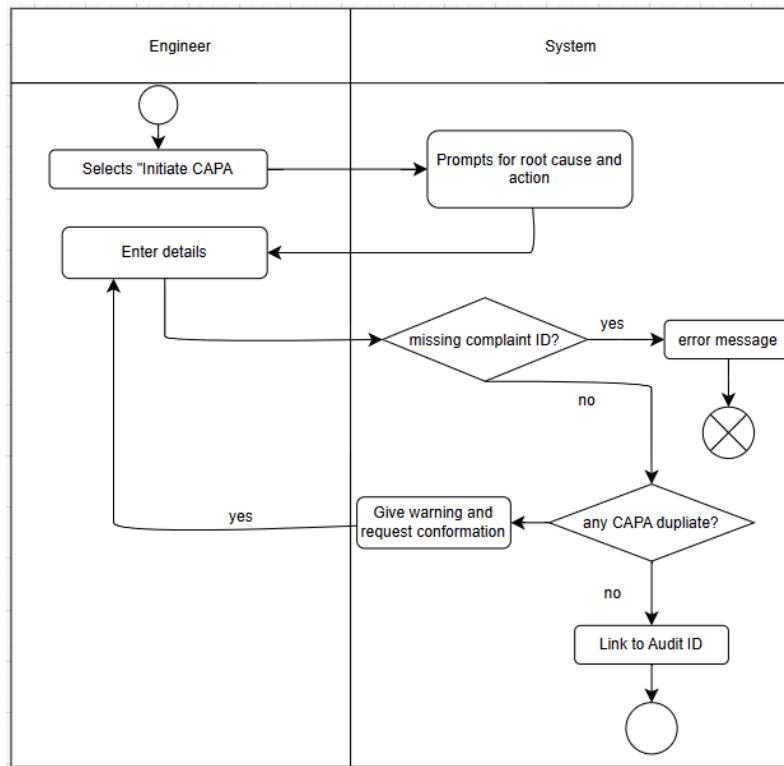


Figure 2.4.5.2: Activity Diagram for Initiate CAPA

2.4.6 US006: User Story Manage Competency and Training

Table 2.4.6.1: User Story Description for Manage Competency and Training

User story: UC006 - Manage Competency and Training
ID: US006
User Story Description As a HR specialist I want i want to manage competency and training So that competency gaps are addressed
Flow of events: 1. Manager assigns training 2. System displays staff skill matrix 3. Specialist assesses skills and identifies gaps 4. Specialist schedules training 5. System updates training plan and competency records
Alternative flow n:
Acceptance Criteria Precondition: Employee record exists Postcondition: Competency gaps addressed and training scheduled
Exception flow: Staff profile missing: error message

Figure 2.4.6.1: Sequence Diagram for Manage Competency and Training

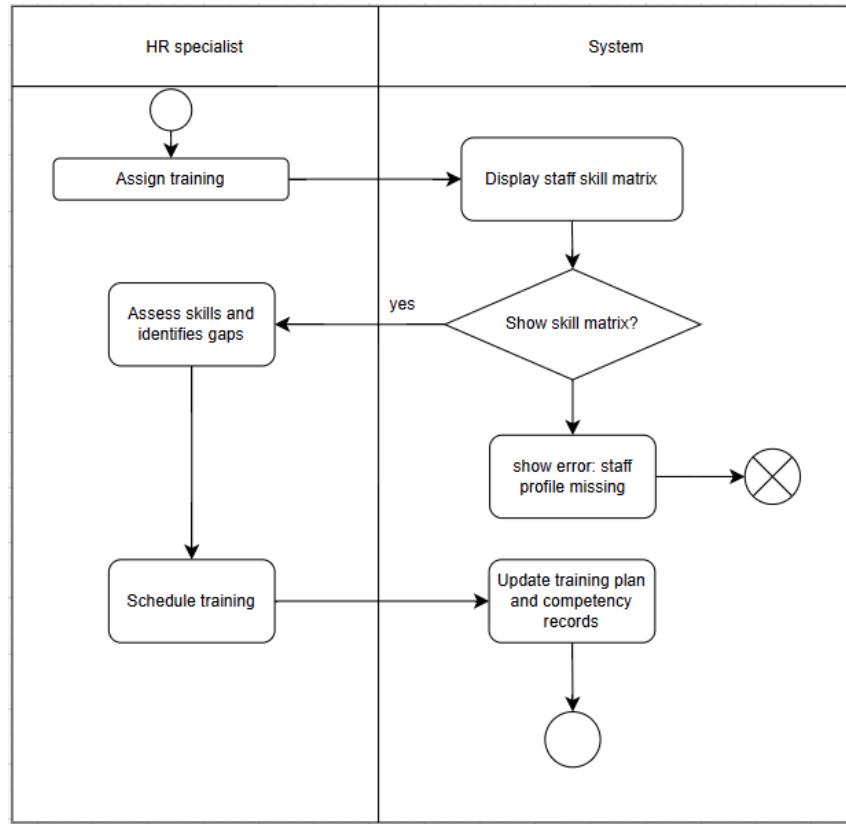


Figure 2.4.6.2: Activity Diagram for Manage Competency and Training

2.4.7 US007: User Story Manage Equipment & Inventory

Table 2.4.7.1: User Story Description for Manage Equipment & Inventory

User story: UC007 - Manage Equipment & Inventory
ID: US007
User Story Description As an Engineer I want manage equipment and inventory So that calibration, maintenance, and readiness are tracked
Flow of events: <ol style="list-style-type: none">1. Engineer selects “Manage Equipment”2. System displays equipment list and inventory.3. Engineer updates calibration, maintenance, or readiness status4. System logs updates and sets readiness flag
Alternative flow n: Equipment not found: system prompts for registration
Acceptance Criteria Precondition: Engineer logged in; equipment registered Postcondition: Equipment and inventory status updated
Exception flow: Calibration overdue: alert triggered

Figure 2.4.7.1: Sequence Diagram for Manage Equipment & Inventory

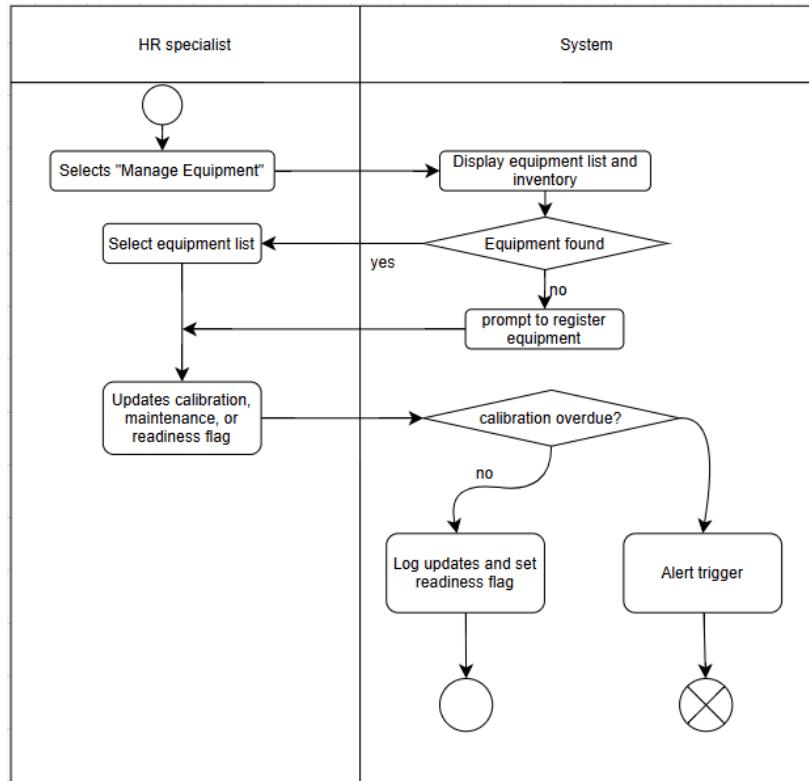


Figure 2.4.7.2: Activity Diagram for Manage Equipment & Inventory

2.4.8 US008: User Story Monitor KPIs

Table 2.4.8.1: User Story Description for Monitor KPIs

User story: UC008 - Monitor KPIs
ID: US009
User Story Description
As a Manager I want to monitor KPIs So that I can evaluate departmental performance.
Flow of events: <ol style="list-style-type: none">1. Manager selects “Monitor KPIs”2. System displays metrics(quality, efficiency, satisfaction)3. Manager reviews trends and flags issues
Alternative flow n: KPI data incomplete: system highlights missing feeds
Acceptance Criteria Precondition: Manager logged in;KPI dashboard accessible Postcondition: KPI insight available for decision making
Exception flow: Data feed error: dashboard incomplete

Figure 2.4.8.1: Sequence Diagram for Monitor KPIs

Figure 2.4.8.2: Activity Diagram for Monitor KPIs

2.4.9 US009: User Story Manage Change

Table 2.4.9.1: User Story Description for Manage Change

User story: UC009 - Manage Change
ID: US009
User Story Description As an Admin I want to manage change request So that updates are controlled and documented
Flow of events: <ol style="list-style-type: none">1. Admin selects “manage change.”2. System prompts for change details and impact3. Admin submits request4. System routes for approval and logs status
Alternative flow n: Change rejected: returned with comments
Acceptance Criteria Precondition: Support request received from a client or staff member Postcondition: Change request tracked and controlled
Exception flow: Approval delayed: escalation triggered

Figure 2.4.9.1: Sequence Diagram for Manage Change

Figure 2.4.9.2: Activity Diagram for Manage Change

2.4.10 US010: User Story Provide System Support

Table 2.4.10.1: User Story Description for Provide System Support

User story: UC010 - Provide System Support
ID: US010
User Story Description
<p>As an Admin I want to provide system support So that client and staff issues are resolved quickly</p>
Flow of events: <ol style="list-style-type: none">1. Admin views incoming support requests2. Admin responds or escalates3. System logs resolution
Alternative flow n: Issue unresolved: flagged for follow up
Acceptance Criteria Precondition: Admin logged in; support portal active Postcondition: Support ticket resolved or escalated
Exception flow: Ticket misrouted: reassignment required

Figure 2.4.10.1: Sequence Diagram for Provide System Support

Figure 2.4.102: Activity Diagram for Provide System Support

2.4.11 US011: User Story Maintain System logs

Table 2.4.11.1: User Story Description for Maintain System Logs

User story: UC011 - Maintain System Logs
ID: US011
User Story Description As an Admin I want to maintain system logs So that activities are traceable for accountability
Flow of events: <ol style="list-style-type: none">1. System automatically records activities (logins, approvals, changes)2. Admin selects “view logs”3. Admin filters and exports logs
Alternative flow n: Log corruption detected: system initiates recovery
Acceptance Criteria Precondition: Admin logged in; logging service active Postcondition: Logs available for audit and traceability
Exception flow: Logging service down: alert triggered

Figure 2.4.11.1: Sequence Diagram for Maintain System Logs

Figure 2.4.11.2: Activity Diagram for Maintain System Logs

2.4.12 US010: User Story Manage Risks

Table 2.4.12.1: User Story Description for Manage Risks

User story: UC012 - Manage Risks
ID: US012
User Story Description As a Quality Officer I want to manage risks So that potential issues are identified, assessed, and mitigated
Flow of events: <ol style="list-style-type: none">1. Officer selects “manage Risks.”2. System prompts for risks area and likelihood3. Officer submits risk entry4. System logs and prioritize risk
Alternative flow n: Duplicate risk entry: system suggests merge
Acceptance Criteria Precondition: Quality Officer logged in; process data accessible Postcondition: Risk identified, assessed, and tracked.
Exception flow: Risk assessment incomplete: flagged for review

Figure 2.4.12.1: Sequence Diagram for Manage Risks

Figure 2.4.12.2: Activity Diagram for Manage Risks

2.4.13 US010: User Story Manage Incident & Feedback

Table 2.4.13.1: User Story Description for Manage Incident & Feedback

User story: UC013 - Manage Incident & Feedback
ID: US013
User Story Description
<p>As a Quality Officer I want to manage Incidents and feedback So that complaints and nonconformities are resolved</p>
<p>Flow of events:</p> <ol style="list-style-type: none"> 1. Officer selects “Report incident/Feedback” 2. System prompts for input type(incident, complaint, suggestion) 3. User enters details including date, location, description, and severity 4. System validates input and logs the report 5. System assigns investigation owner and sets status = Open 6. Assigned officer conducts investigation and enters findings 7. Corrective actions are defined and tracked 8. System updates status to resolved or escalated
<p>Alternative flow n: Duplicate report detected: system links to existing case</p>
<p>Acceptance Criteria Precondition: Quality Officer logged in; incident or feedback reported Postcondition: Incident/Feedback recorded, investigated, and resolution status updated</p>
<p>Exception flow: Root cause unclear: system escalates to review panel Investigation owner unavailable: reassignment triggered Critical Incident flagged: immediate notification sent to management</p>

Figure 2.4.13.1: Sequence Diagram for Manage Incident & Feedback

Figure 2.4.13.2: Activity Diagram for Manage Incident & Feedback

2.5 Performance and Other Requirements

This section details the non-functional requirements (NFRs) necessary to ensure QMS-Flow operates effectively within Avialite's environment.

2.5.1 Performance Requirements

- Response Time:
 - The system must load dashboard pages within 2 seconds and complete document search queries within 3 seconds over the internal network.
- Throughput:
 - The system must support simultaneous access by at least 50 concurrent users (management, engineers, and auditors) without performance degradation.
- Capacity:
 - The database must support the storage of up to 10,000 document versions and 5 years of historical audit data without archival.
- Availability:
 - The system must maintain 99.9% availability during business hours (8:00 AM – 6:00 PM) to ensure uninterrupted access to SOPs and audit logs.

2.5.2 Security Requirements

- Access Control:
 - The system must implement strictly Role-Based Access Control (RBAC). Only users with the "Manager" role can approve documents, and only "Auditors" can close audit findings.
- Data Integrity:
 - The system must maintain an immutable Audit Trail for all document changes, capturing the User ID, Timestamp, and Action (Create, Edit, Approve, Delete).
- Encryption:
 - All sensitive data (employee competency records and proprietary technical drawings) must be encrypted at rest (AES-256) and in transit (TLS 1.2+).

2.5.3 Reliability and Recoverability

- Data Backups:
 - The system must perform automated incremental backups daily and full backups weekly.
- Recovery Time:
 - In the event of a system failure, the system must be recoverable within 4 hours (RTO) with a maximum data loss of 1 hour (RPO).

2.6 Design Constraints

This section outlines the limitations and standards that strictly govern the design and development of QMS-Flow.

2.6.1 Regulatory and Compliance Constraints

- ISO Compliance:
 - The system workflow must strictly adhere to ISO 9001:2015 clauses regarding "Documented Information" (Clause 7.5) and "Performance Evaluation" (Clause 9).
- Auditability:
 - The system architecture must prevent the deletion of any finalized audit records or approved CAPA reports to satisfy external regulatory audits.

2.6.2 Hardware and Software Constraints

- Browser Compatibility:
 - The web interface must be fully functional on the latest stable versions of Google Chrome and Microsoft Edge, as these are the standard browsers used at Avialite Sdn. Bhd.
- Legacy Integration:

- The system must be able to export reports in .CSV and .PDF formats to ensure compatibility with legacy reporting tools used by upper management.
- Hosting:
 - The system must be deployable on the existing Avialite on-premise Windows Server environment (or specified Cloud Provider) with limited internet bandwidth for external access.

2.6.3 User Interface Constraints

- Mobile Accessibility:
 - The "Approve Document" and "Record Audit Findings" modules must be responsive and usable on tablet devices (iPad/Android) to facilitate on-site factory audits.
- Language:
 - The user interface must be provided in English, as it is the operational language of Avialite Sdn. Bhd

3 System Architectural Design

3.1 Architecture Style and Rationale

The architectural style chosen for the development of the QMS-Flow system is the

Layered Architecture. This architectural style arranges the system into a set of

logical layers where each layer is responsible for a specific group of functionalities and

provides services to the layer above it. The lowest layer represents the core services

of the system such as data storage and access while higher layers focus on

application logic and user interaction. This structure allows the system to be

developed in an organized manner.

The layered architecture is suitable for QMS-Flow because it is a web-based system

that must support multiple quality management modules such as Training

Management, Corrective Action (CAPA), Equipment and Device Management, and

Management Review. By separating the system into layers, each QMS module can be

developed, maintained, and upgraded independently without affecting other parts of

the system. This approach supports incremental development, allowing new modules

or features to be added over time as organizational requirements evolve.

Another important reason for selecting this architectural style is its ability to localize changes within the system. When changes and modifications are made to one layer,

only the adjacent layers are affected. This reduces the risk of system-wide errors and

improves maintainability. For QMS-Flow, this is especially important as ISO 9001:2015

requirements may change or require updates to processes and documentation.

Moreover, layered architecture supports multi-level access control and security which

is important for QMS-Flow since there are different user roles . Security checks and authorization rules can be enforced in appropriate layers that users only access functions permitted by their role. Thus, the best choice for QMS-Flow system is layered structure.

3.2 Component Model

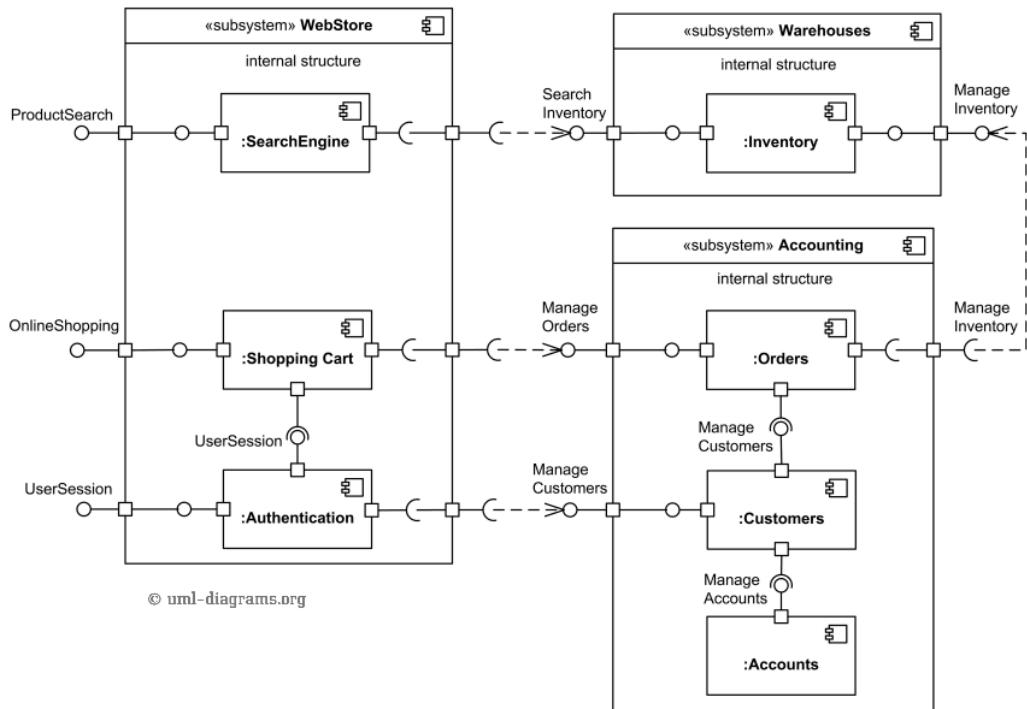


Figure 3.1: Component Diagram of <Name of the System>

4 Detailed Description of Components

4.1 Complete Package Diagram

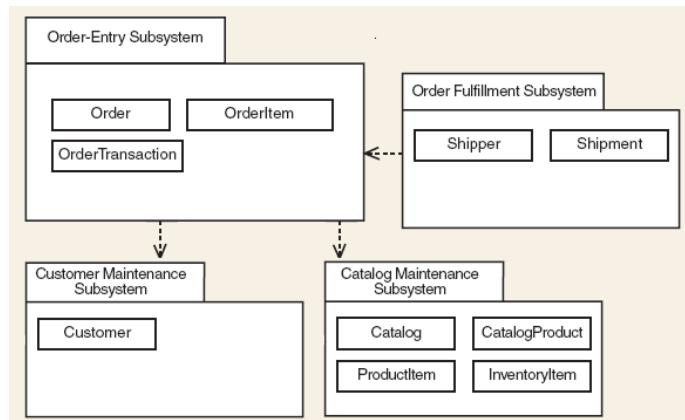


Figure 4.1: Package Diagram for <Name of the System>

4.2 Detailed Description

4.2.1 P001: Audit Management Module Subsystem

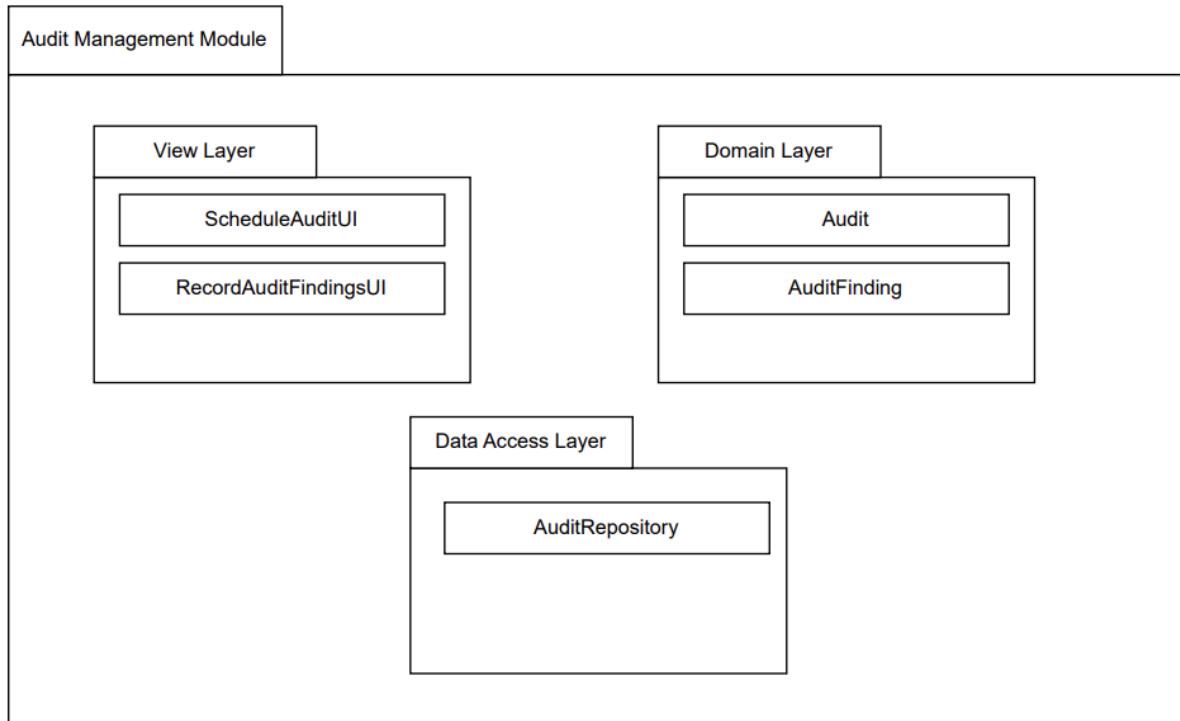


Figure 4.2.1: Package Diagram for Audit Management Module Subsystem

4.2.1.1 Class Diagram

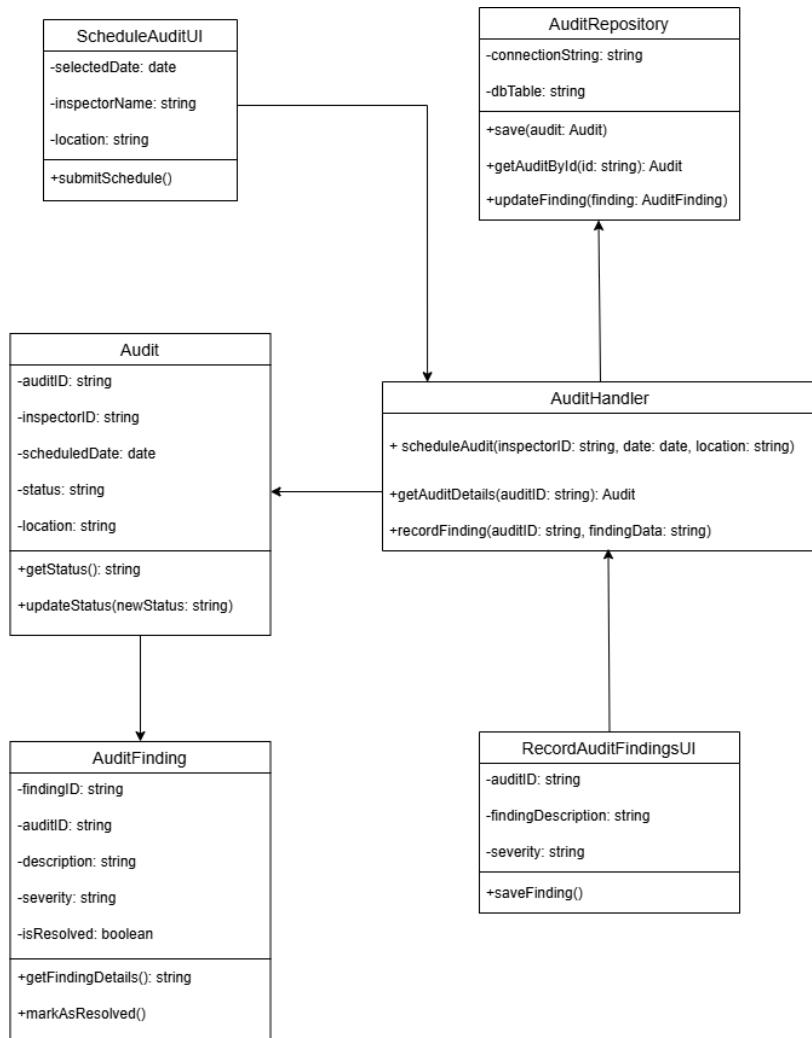
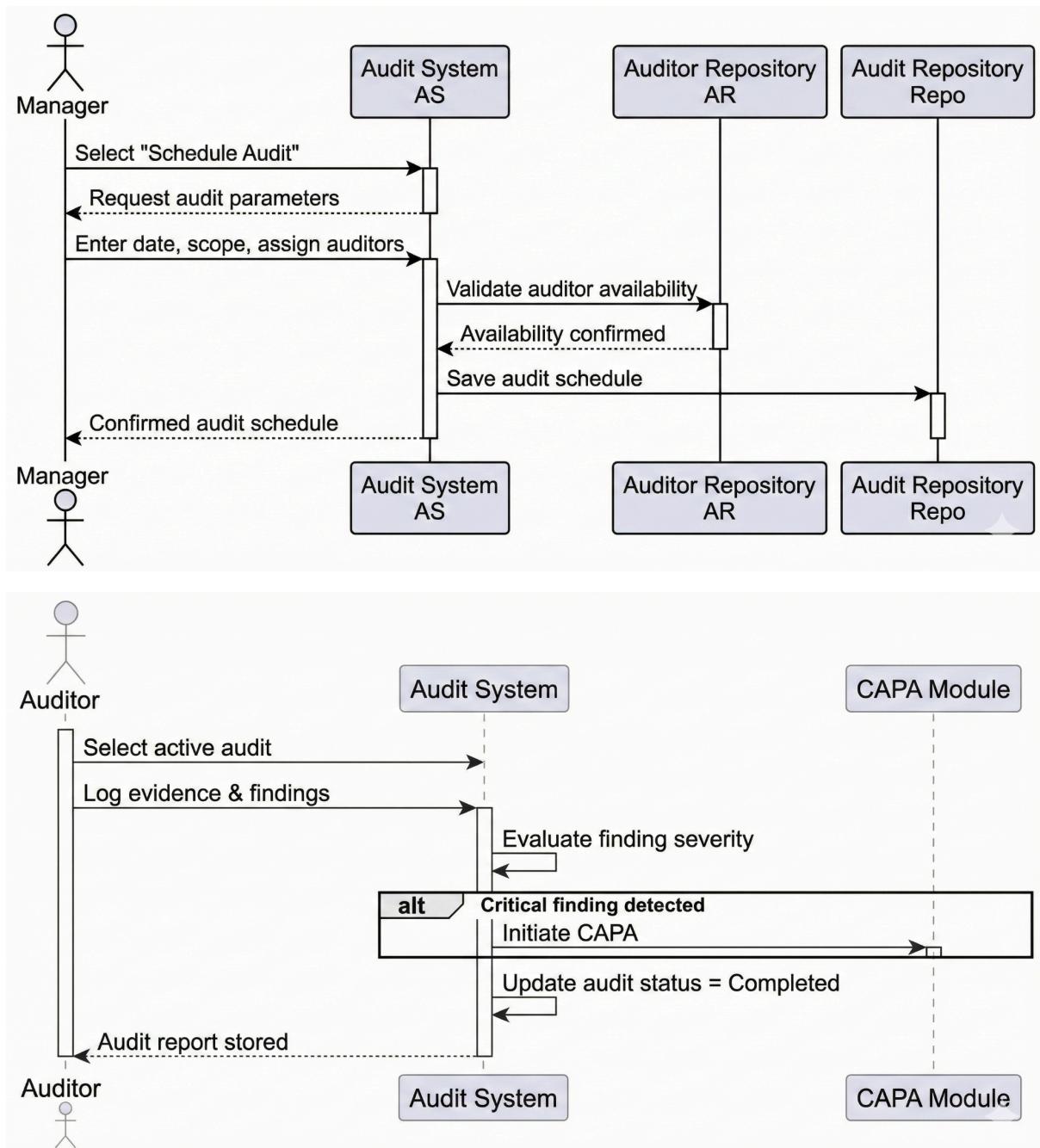


Figure 4.2.2: Class Diagram for <Name of Package 1> Subsystem

Entity Name	Audit
Method Name	ScheduleAuditUI
Input	Audit Date, Scope, Assigned Auditor(s)
Output	Confirmed Audit Schedule
Algorithm	<ol style="list-style-type: none"> 1. Start 2. Manager selects "Schedule Audit" 3. Input audit parameters (dates, scope) and assign Auditors 4. Validate auditor availability 5. Save schedule to Audit Repository 6. End

Entity Name	AuditFinding
Method Name	RecordAuditFindingsUI
Input	Audit Evidence, Non-conformity Details
Output	Stored Audit Report / Triggered CAPA
Algorithm	<ol style="list-style-type: none"> 1. Start 2. Auditor selects active audit 3. Log evidence and specific findings 4. If critical finding exists, trigger UC05: Initiate CAPA 5. Update Audit status to "Completed" 6. End

4.2.1.2 Sequence Diagram



4.2.2 P002: Document & Change Management with KPI Dashboard Module Subsystem

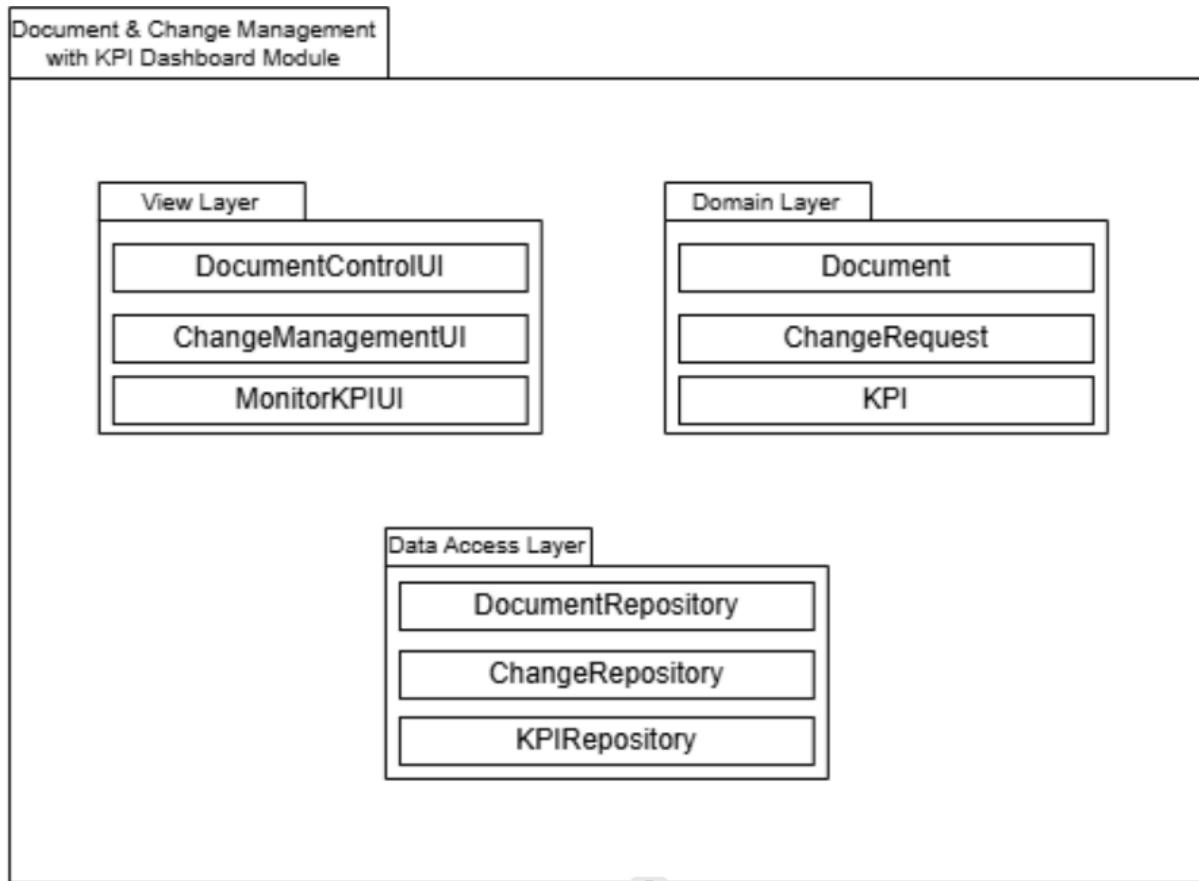


Figure 4.3.1: Package Diagram for Document & Change Management with KPI Dashboard Module Subsystem

4.2.2.1 Class Diagram

Entity Name	Document
Method Name	DocumentControlUI
Input	Document File, Metadata
Output	Formal Approved Document for Traceability
Algorithm	<ol style="list-style-type: none">1. Start2. Upload & Metadata: Staff captures new document file and enters metadata (Title, Version, Owner) for traceability.3. Validation: System checks for duplicate IDs and assigns "Draft" status.4. Review Queue: Document is routed to the Manager or Auditor for review.5. Decision Logic: Manager reviews files against compliance requirements to ensure they are formally approved before use.6. Approval: If requirements are met, the system updates status to "Approved" and makes it available for use.7. Rejection: If requirements are not met, system records comments and returns the file to "Draft" for revision.8. Log Update: Every status change is automatically recorded in the System Logs (UC11) for accountability.9. End

Entity Name	KPIReport
Method Name	MonitorKPIUI
Input	Performance Data from all modules
Output	Real-time Performance Dashboards
Algorithm	<ol style="list-style-type: none"> 1. Start 2. System aggregates data from Audit, CAPA, and Training 3. Calculate metrics against targets 4. Display on Manager's dashboard 5. If KPI < target, trigger UC05: Initiate CAPA 6. End

Entity Name	ChangeRequest
Method Name	ChangeManagementUI
Input	Proposed Change, Rationale
Output	Process/Document Update
Algorithm	<ol style="list-style-type: none"> 1. Start 2. Staff proposes process/document changes 3. Manager/Admin reviews proposal 4. If approved, route to UC02 for final document approval 5. Update change logs 6. End

4.2.2.2 Sequence Diagram

//buat macam kat srs.. Buat bahagian view layer 444(afiq irfan cakap)

4.2.3 P003: Admin & System support Module Subsystem

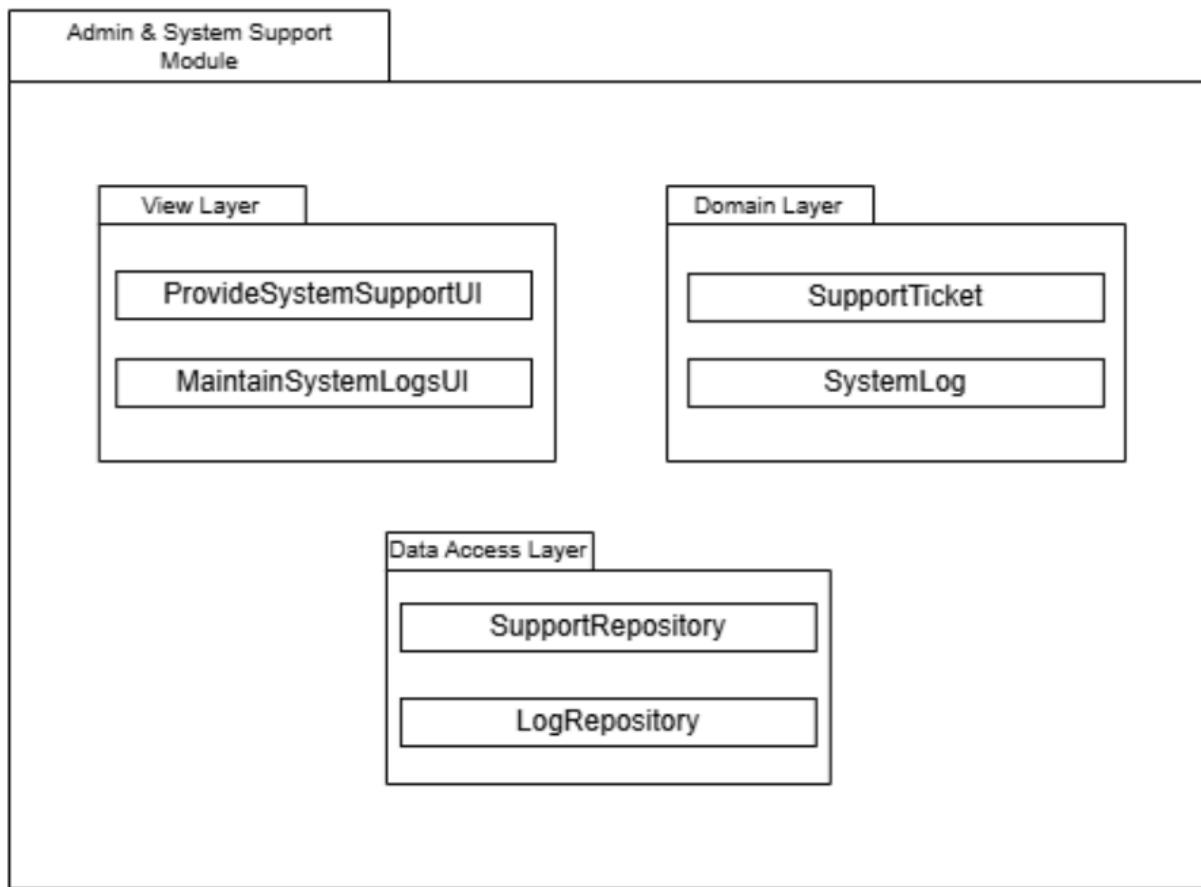


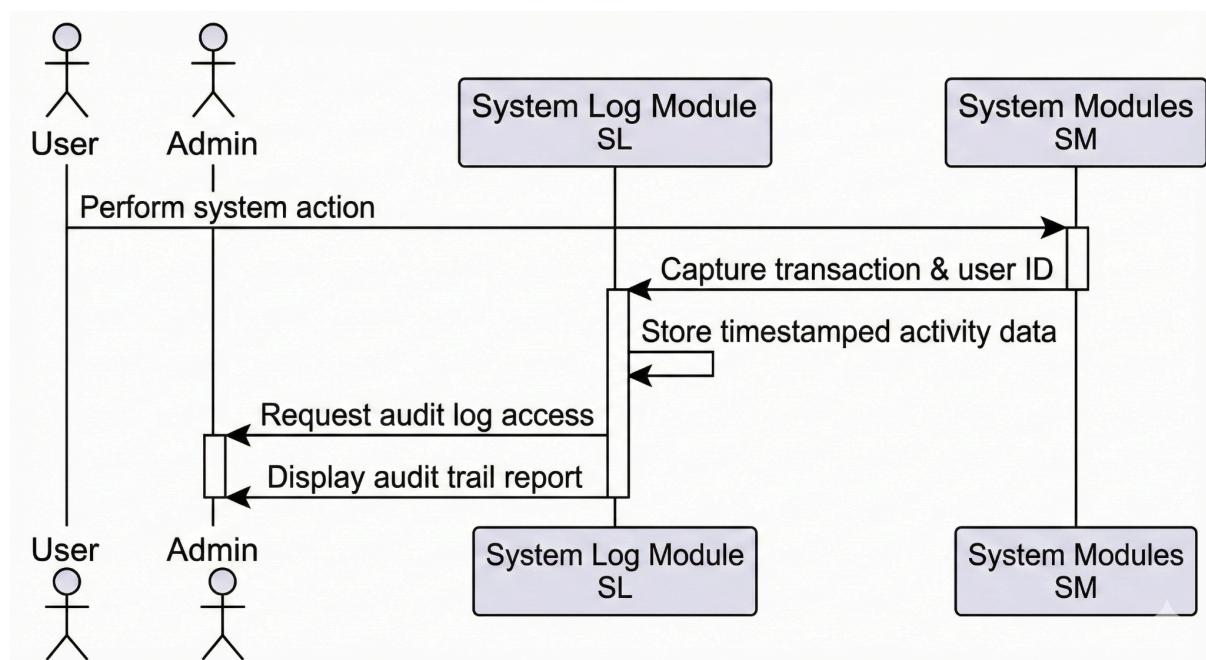
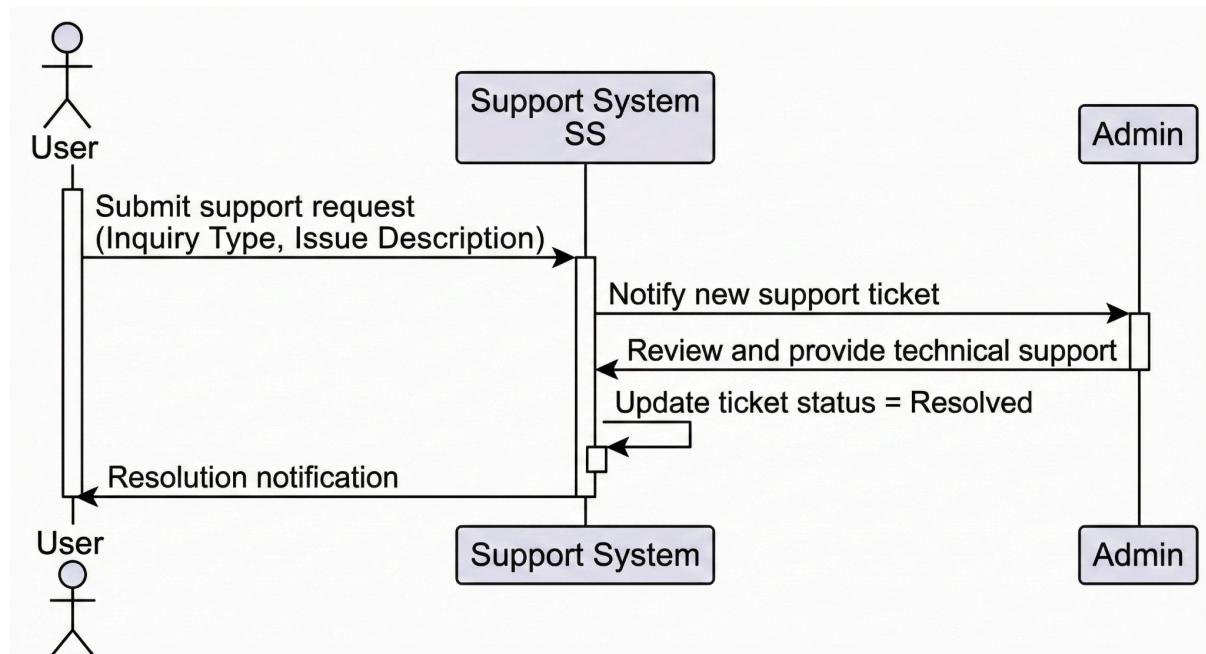
Figure 4.4.1: Package Diagram for Admin & System support Module Subsystem

4.2.3.1 Class Diagram

Entity Name	SupportTicket
Method Name	ProvideSystemSupportUI
Input	Inquiry Type, Issue Description
Output	Resolution to Inquiry
Algorithm	<ol style="list-style-type: none"> 1. Start 2. User submits support request 3. Admin reviews and provides technical support 4. Update ticket to "Resolved" 5. End

Entity Name	SystemLog
Method Name	MaintainSystemsLogsUI
Input	System Transactions, User ID
Output	Audit Trail for Accountability
Algorithm	<ol style="list-style-type: none"> 1. Start 2. Automatically capture every user action across modules 3. Store timestamped activity data 4. Provide log access for Admin review 5. End

4.2.3.2 Sequence Diagram



4.2.4 P004: CAPA Management Module

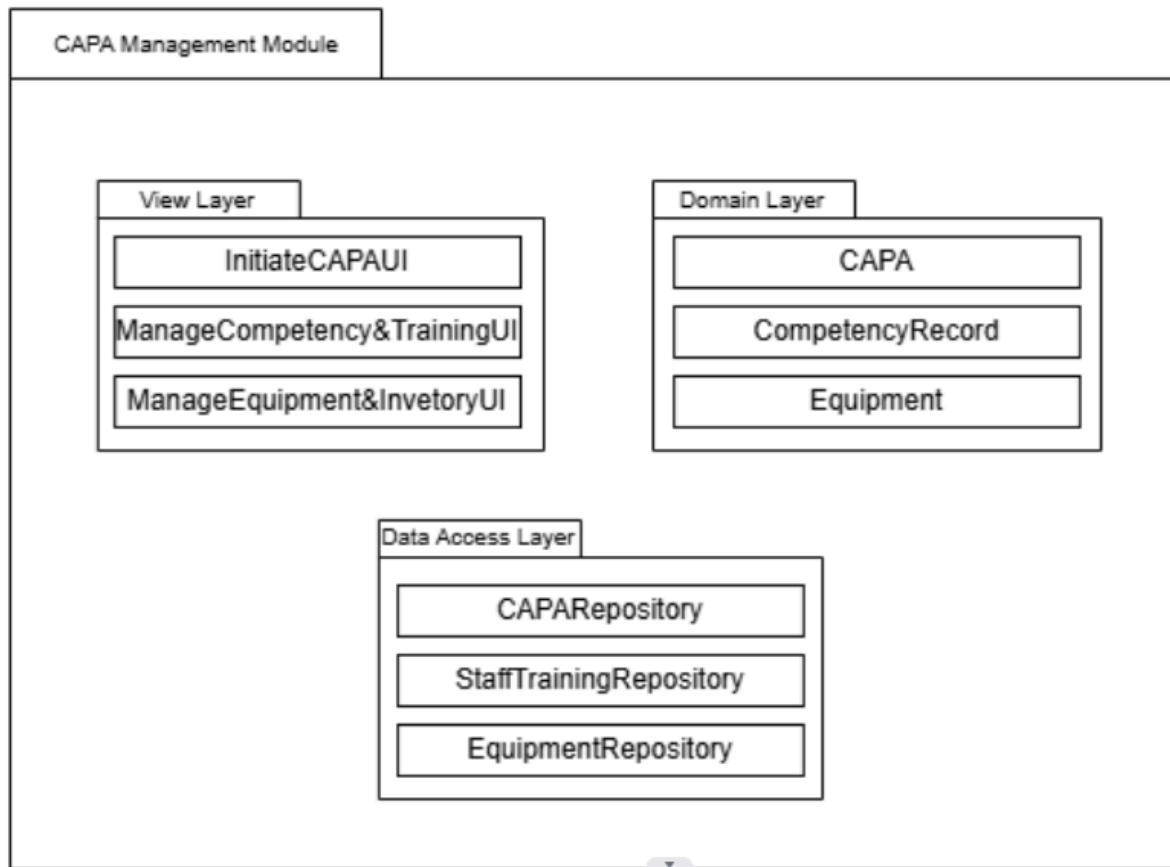


Figure 4.4.1: Package Diagram for CAPA Management Module Subsystem

4.2.4.1 Class Diagram

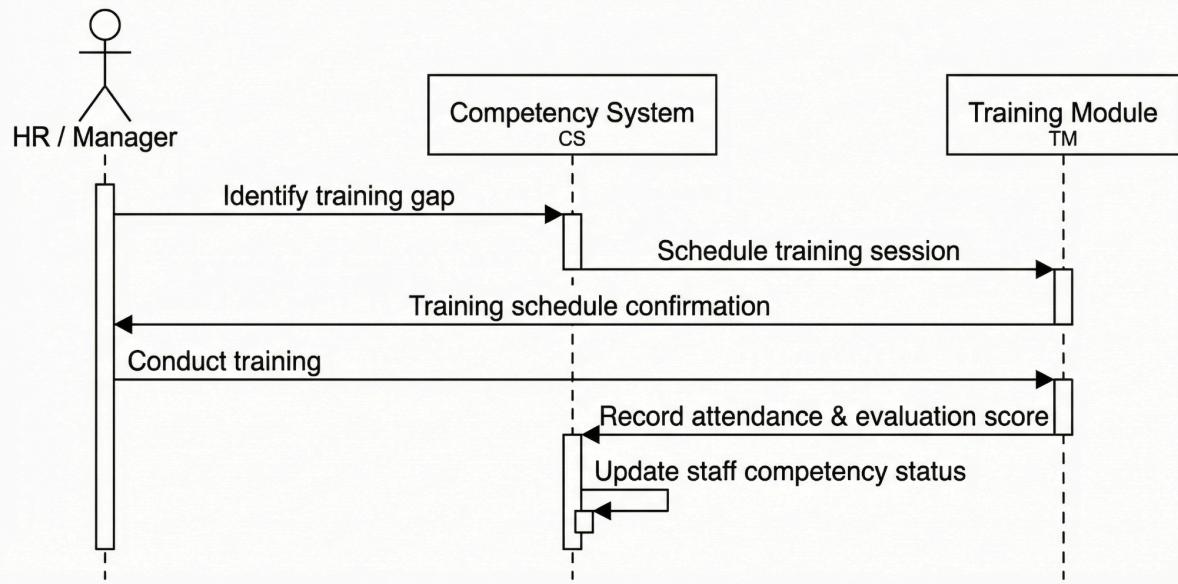
Entity Name	CAPA
Method Name	IniateCAPAUI
Input	Source Issue (Audit/Incident/KPI), Root Cause
Output	Open Corrective Action Plan
Algorithm	<ol style="list-style-type: none"> 1. Start 2. Receive trigger from Audit, KPI, or Risk 3. Log issue and perform root cause analysis 4. Assign action owner and deadline 5. End

Entity Name	CompetencyRecord
Method Name	ManageCompetency&TrainingUI
Input	Staff ID, Training Requirements, Evaluation Results
Output	Updated Staff Competency Log
Algorithm	<ol style="list-style-type: none"> 1. Start 2. HR/Manager identifies training gap (often from CAPA) 3. Schedule training session 4. Record attendance and evaluation score 5. Update staff competency status 6. End

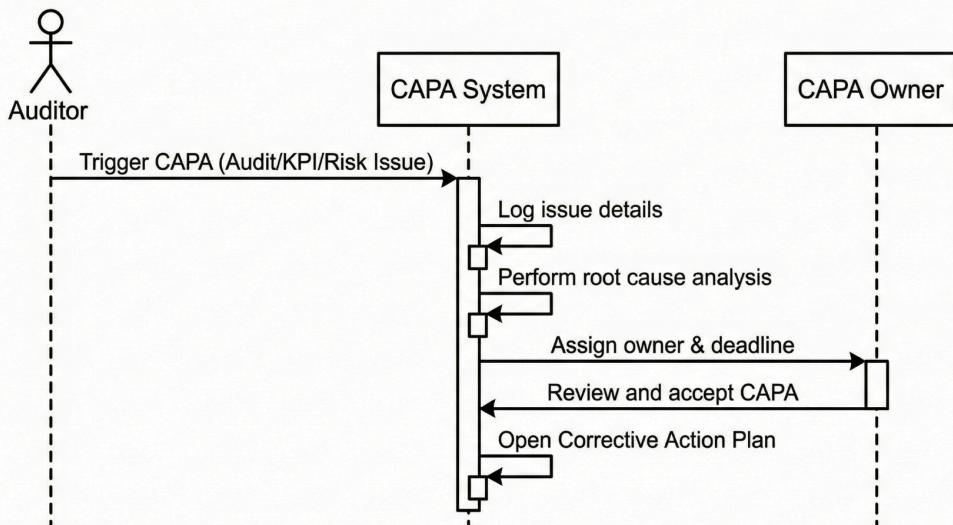
Entity Name	Equipment
Method Name	ManageEquipment&InventoryUI
Input	Asset ID, Maintenance Schedule, Calibration Data
Output	Equipment Readiness Status
Algorithm	<ol style="list-style-type: none"> 1. Start 2. System checks calibration schedules 3. Engineer performs maintenance/calibration 4. Log results and update "Ready" status 5. End

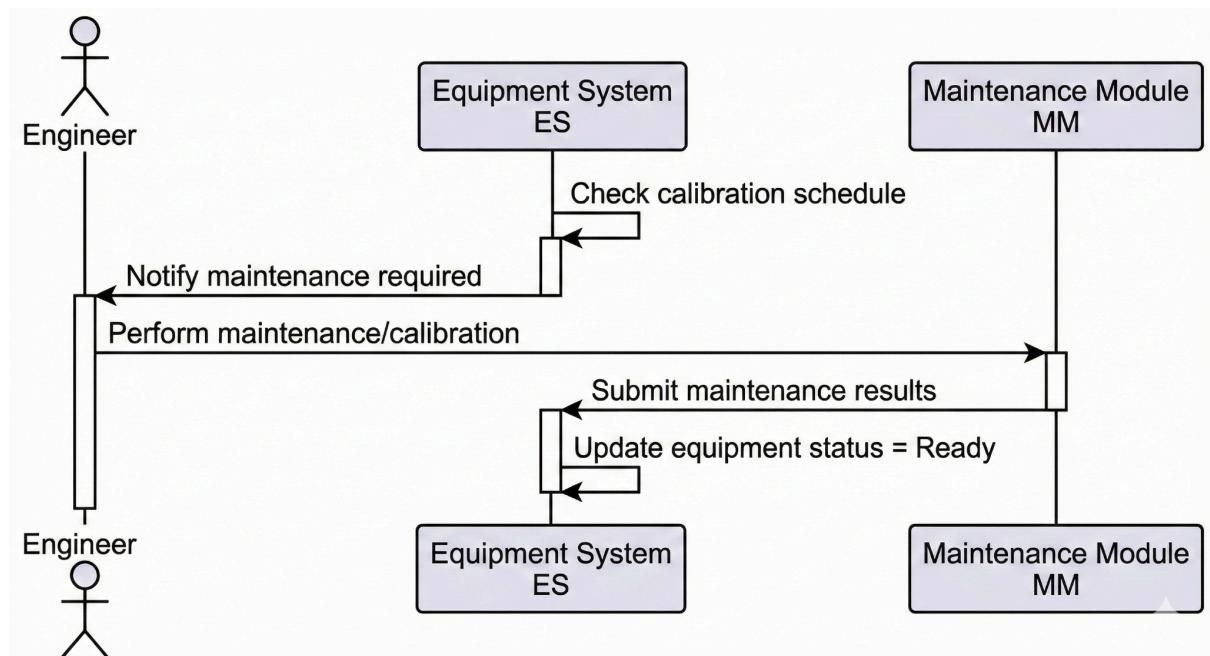
4.2.4.2 Sequence Diagram

Sequence Diagram – Staff Competency Training Workflow



Sequence Diagram – CAPA Initiation Process





4.2.5 P005: Risk & Incident Management Module

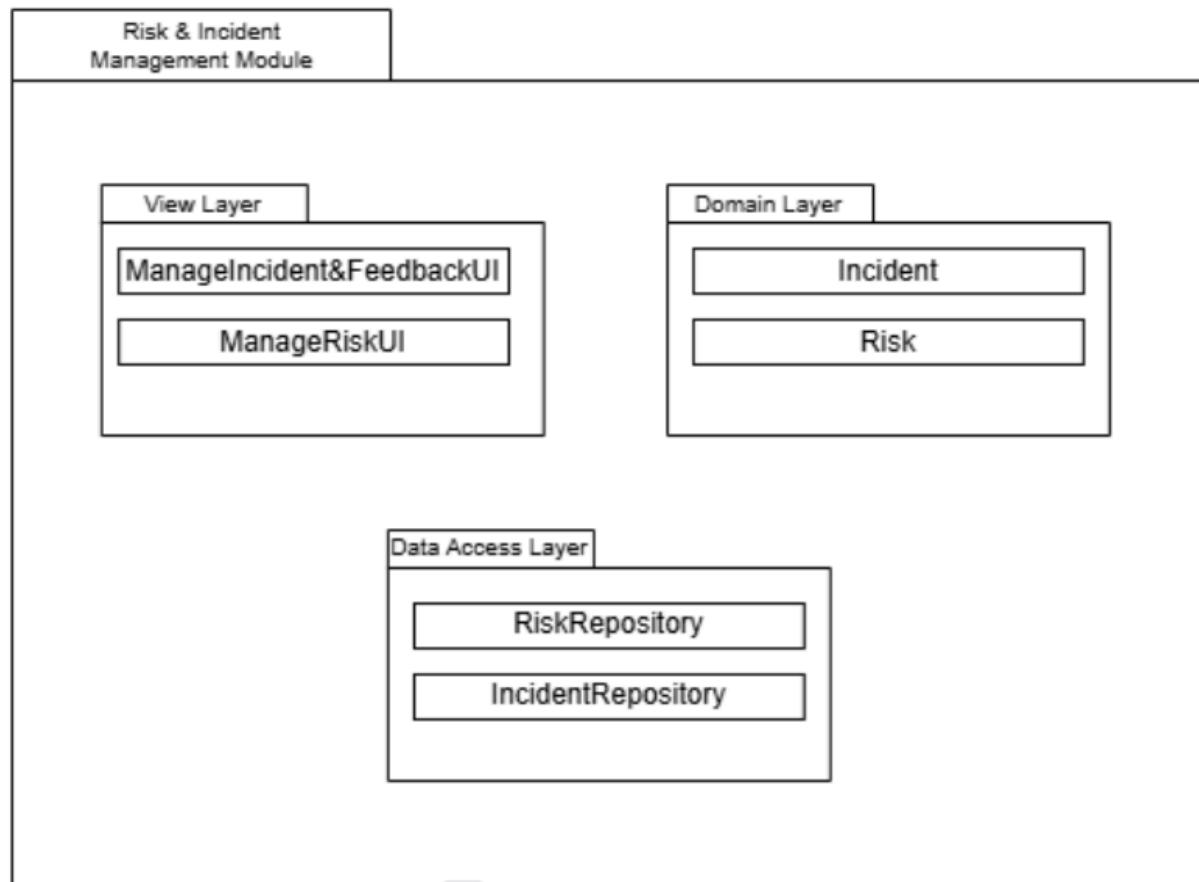


Figure 4.5.1: Package Diagram for Risk & Incident Management Module Subsystem

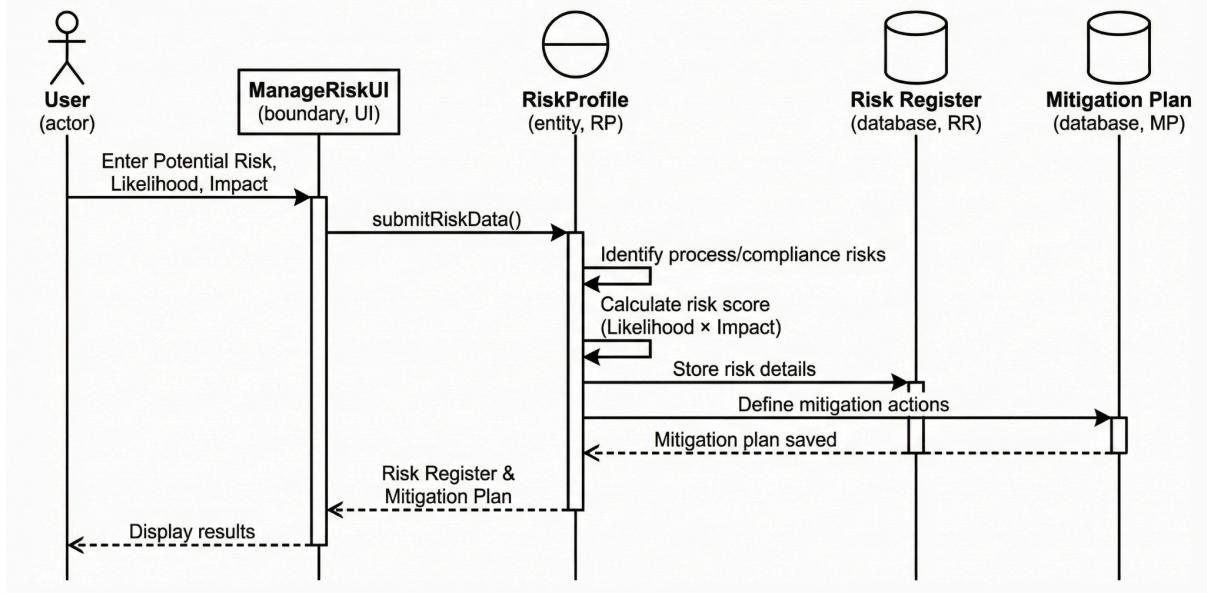
4.2.5.1 Class Diagram

Entity Name	RiskProfile
Method Name	ManageRiskUI
Input	Potential Risk, Likelihood, Impact
Output	Risk Register & Mitigation Plan
Algorithm	<ol style="list-style-type: none"> 1. Start 2. Identify potential process/compliance risks 3. Score risk priority (Likelihood x Impact) 4. Define and track mitigation actions 5. End

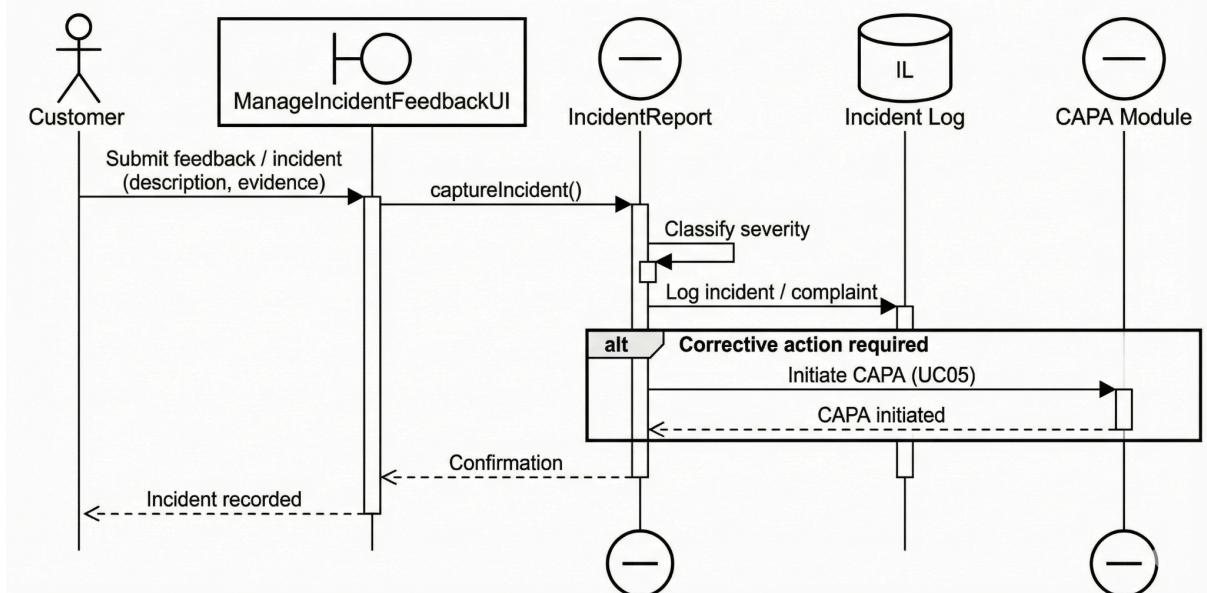
Entity Name	IncidentReport
Method Name	ManageIncident&FeedbackUI
Input	Customer Feedback, Incident Description, Evidence
Output	Logged Incident/Complaint Record
Algorithm	<ol style="list-style-type: none"> 1. Start 2. Capture feedback or report nonconformity 3. Classify severity 4. Route to UC05: Initiate CAPA if corrective action is needed 5. End

4.2.5.2 Sequence Diagram

Sequence Diagram – Manage Risk (RiskProfile)



Sequence Diagram – Manage Incident & Feedback (IncidentReport)



5 Data Design

5.4 Data Description

The major data or systems entities are stored into a relational database named QMSFlowDB and processed and organized into 17 entities as listed in Table 5.1. Data is organized into normalized tables to reduce redundancy and maintain consistency.

Table 5.1: Description of Entities in the Database

No.	Entity Name	Description
1.	Approval	Stores approval records for documents and change requests.
2.	Audit	Stores audit schedules, scope, and assigned auditors.
3.	AuditFinding	Stores findings and nonconformities identified during audits.
4.	CAPA	Stores corrective and preventive action records linked to findings, incidents, or risks.
5.	ChangeRequest	Stores requests for document or process changes.
6.	CompetencyAssessment	Stores employee competency evaluation results.
7.	Document	Stores documents with versioning, metadata, and approval status.
8.	Equipment	Stores equipment records, calibration dates, and status.
9.	Feedback	Stores customer complaints, suggestions, and satisfaction ratings.
10.	Incident	Stores reported incidents and nonconformities.

11.	Investigation	Stores investigations into incidents, including root cause and resolution.
12.	KPI	Stores performance metrics and results
13.	Risk	Stores identified risks, likelihood, impact, and mitigation plans.
14.	SystemLog	Stores system activity logs for accountability and troubleshooting.
15.	TrainingRecord	Stores employee training records and completion status.
16.	User	Stores system users (engineers, managers, auditors, customers).
17.	UserAccess	Stores user roles and permissions granted by admins.

5.5 Data Dictionary

Entity: <Approval>

Attribute Name	Type	Description
approvalID	String	Unique approval record
documentID	String	Links to document
approverID	String	User ID of approver
approvalDate	Date	Date of approval
status	String	Pending/Approved/Rejected

5.5.2 Entity: <Audit>

Attribute Name	Type	Description
auditID	String	Unique audit record
scheduleDate	Date	Date when audit is scheduled
scope	String	Scope covered
auditorID	String	Linked to User (auditor)
status	String	Planned/In Progress/Closed

5.5.3 Entity: <AuditFinding>

Attribute Name	Type	Description
findingID	String	Unique finding record
auditID	String	Linked to Audit
description	String	Details of finding
severity	String	Minor/Major/Critical
status	String	Open/Closed

5.5.4 Entity: <CAPA>

Attribute Name	Type	Description
capaID	String	Unique CAPA record
relatedFindingID	String	Linked to AuditFinding
Issue	String	Issue description
rootCause	String	Root cause analysis
actionPlan	String	Corrective/preventive plan
status	String	Raised/Implemented/Closed
responsibleUserID	String	Linked to User (responsible)

5.5.5 Entity: <ChangeRequest>

Attribute Name	Type	Description
changeID	String	Unique change request
documentID	String	Linked to Document
requesterID	String	Linked to User
reason	String	Reason for change
status	String	Requested/Approved/Rejected/Implemented
requestDate	Date	Date submitted

5.5.6 Entity: <CompetencyAssessment>

Attribute Name	Type	Description
assessmentID	String	Unique assessment record
employeeID	String	Linked to User
assessmentDate	Date	Date of assessment
result	String	Pass/Fail/Needs Improvement

5.5.7 Entity: <Document>

Attribute Name	Type	Description
docID	String	Unique document Identifier
title	String	Document title
version	Double	Version number
status	String	Draft/Approved/Archived
createdDate	Date	Date created
authorID	String	Linked to User (author)

5.5.8 Entity: <Equipment>

Attribute Name	Type	Description
equipmentID	String	Unique equipment record
name	String	Equipment name
createdDate	Date	Last calibration date
status	String	Active/Inactive/Needs Calibration

5.5.9 Entity: <Feedback>

Attribute Name	Type	Description
feedbackID	String	Unique feedback record
customerID	String	Linked to User (customer)
comments	String	Feedback text
rating	integer	Satisfaction rating (1-5)

date	Date	Submission date
------	------	-----------------

5.5.10 Entity: <Incident>

Attribute Name	Type	Description
incidentID	String	Unique incident record
reporterID	String	Linked to User (reporter)
description	String	Incident details
date	Date	Date reported
status	String	Reported/Investigating/Closed

5.5.11 Entity: <Investigation>

Attribute Name	Type	Description
investigationID	String	Unique investigation record
incidentID	String	Linked to incident
assignedTo	String	Linked to User
rootCause	String	Root cause analysis
resolution	String	Resolution details
completionDate	Date	Date completed

5.5.12 Entity: <KPI>

Attribute Name	Type	Description
kpID	String	Unique KPI record
metricName	String	KPI name
targetValue	Double	Target threshold
actualValue	Double	Actual measured value
status	String	Met/Not Met
managerID	String	Linked to User (manager)

5.5.13 Entity: <Risk>

Attribute Name	Type	Description
riskID	String	Unique risk record
description	String	Risk details
likelihood	Double	Probability value
impact	String	Low/Medium/High
mitigationPlan	String	Mitigation strategy
ownerID	String	Linked to User

5.5.14 Entity: <SystemLog>

Attribute Name	Type	Description
logID	String	Unique log entry
timeStamp	DateTime	Log time
action	String	Action performed
performedBy	String	Linked to User/Admin
module	String	Module affected

5.5.15 Entity: <TrainingRecord>

Attribute Name	Type	Description
recordID	String	Unique training record
employeeID	String	Linked to User
trainingType	String	Training category
completionDate	Date	Completion date
status	String	Completed/Pending

5.5.16 Entity: <User>

Attribute Name	Type	Description
userID	String	Unique user identifier
name	String	Full name
role	String	Admin/Manager/Auditor/Engineer/Customer

email	String	Contact email
status	Boolean	Active/Inactive

5.5.17 Entity: <UserAccess>

Attribute Name	Type	Description
accessID	String	Unique access record
userID	String	Linked to User
role	String	Role assigned
permission	String	Access rights
grantedBy	String	Linked to User (Admin)

6 User Interface Design

6.1 Overview of User Interface

The interface for QMS-FLOW is aimed at providing a simple, secure, and user-friendly environment to support quality management according to ISO 9001:2015. The interface is designed to ensure that the system is clear and consistent to enable the factory personnel to move easily through the system without much training. The system has a dynamic web-based design. For desktop users, there is a persisting side bar to navigate through, and for mobile users such as floor operators, there is a simplified version of the interface designed for handheld interaction.

Key Design Features:

- Role-Based Access Control (RBAC): The user's role determines how the interface changes dynamically and guaranteeing security:
 - Engineers: Get access to a simple dashboard for tracking training status and recording complaints.
 - Managers: Examine team competency matrices, equipment lists, and departmental metrics.
 - Admins: Access approval processes, strategic analytics, and complete system controls.
 - Auditors: Access a restricted "Read-Only" mode for verification Purposes.
- Visual Status Indicators: The system indicates status using a standard "Traffic Light" color scheme to facilitate prompt decision-making:
 - Green: Indicates compliance or completed tasks ("Certified", "Resolved", "Active").
 - Orange/Amber: Indicates warnings or upcoming deadlines ("Due Soon", "Pending").
 - Red: Highlights critical failures or expired items ("Overdue", "Non-Compliant").
- Consistent Navigation: A standardized sidebar menu with module links (such as Dashboard, CAPA Management, and Reports) is present on the left side of every desktop screen. This guarantees that users are always aware of their location within the system.
- Interactive Dashboards: Users are shown relevant dashboards with charts and summary cards after logging in. These are more than just static displays and

they enable users to promptly recognize and take action on critical activities, such awaiting approvals.

- Data Integrity & Feedback: Every action has clear feedback from the system. Sensitive operations (such as audit trails) are monitored in thorough logs for security purposes, and certain views (such as the Auditor Dashboard) have conspicuous banners to denote limited access modes.

6.2 Screen Images

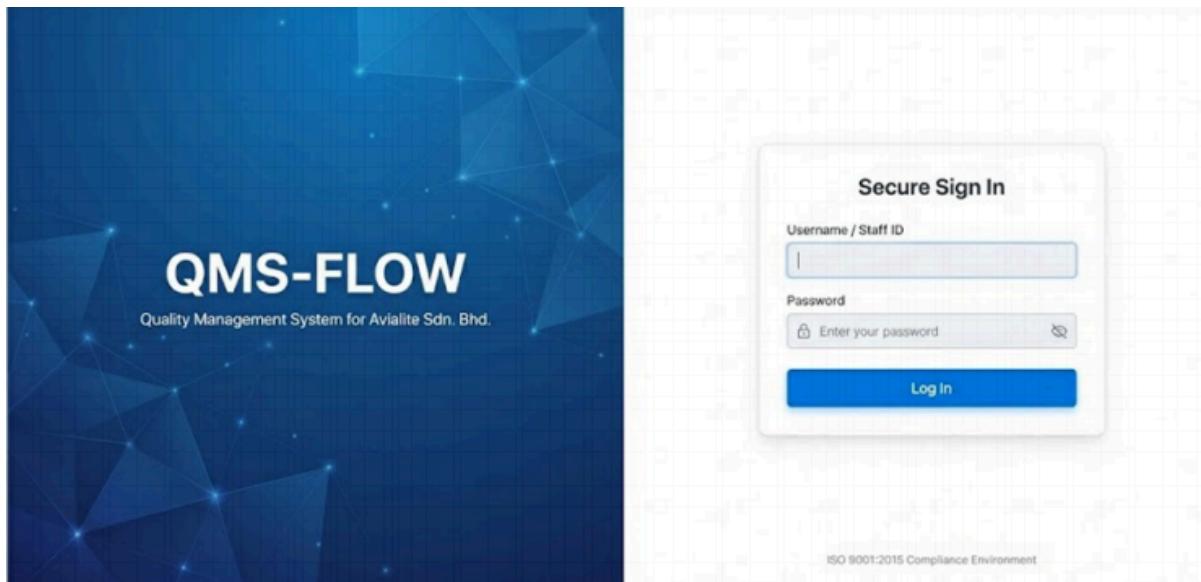


Figure 6.1 : Overview of Login Page

Description : a secure authentication screen that requires a password and a distinct username or staff ID in order to access the system.

Purpose : to tightly regulate access and guarantee that only individuals with the proper authorization can access the system.

The screenshot displays the QMS-FLOW Engineer Dashboard. On the left, a dark sidebar lists navigation options: Dashboard (selected), Log Complaint, SOP Library, My Training, and Settings. The main content area is titled 'Dashboard' and 'Staff / Operator'. It features a 'Quick Actions' section with a blue button labeled '+ Create New Complaint Report' and a grey button labeled 'View Latest SOPs'. Below this is a table titled 'My Recent Submissions' showing five entries:

Date	Complaint ID	Issue Summary	Status
April 24, 2024	CMP-00487	Machine misalignment causing defects	Pending
April 22, 2024	CMP-00472	Quality issue with raw materials	Resolved
April 21, 2024	CMP-00468	Calibration issue with measuring equipment	Resolved
April 18, 2024	CMP-00455	Incorrect documentation in SOP-103	Resolved
April 16, 2024	CMP-00441	Packaging defects observed	Resolved

At the bottom, it says 'Showing 1 to 5 of 25 entries' with navigation buttons for 'Prev', '1', 'Next', and 'Next >'. In the top right corner, there is a user profile icon with the text 'Logged in as: Production Operator'.

Figure 6.2: Overview of Engineer Dashboard

Description : The primary hub of engineers, which includes “Quick Action” as generating reports and a table that displays the status of “My Recent Submissions”.

Purpose : To enable employees to monitor the status of their own submissions and promptly report problems.

The screenshot shows the QMS-FLOW application interface. On the left is a dark blue sidebar with the title 'QMS-FLOW' at the top. Below it are several menu items: 'Dashboard', 'Log Complaint', 'SOP Library', 'My Training' (which is highlighted in blue), and 'Settings'. The main content area has a white background and a title 'My Competency Profile: Operator A'. At the top of this area, there are two status indicators: 'Job Role: Machine Operator' (with a gear icon) and 'Compliance Status: Action Required' (with a warning triangle icon). Below these is a section titled 'Assigned Training Modules' with a table. The table has four columns: 'Module Name', 'Validity/Expiry', 'Status', and 'Action'. There are three rows of data:

Module Name	Validity/Expiry	Status	Action
Fire Safety Protocols	Valid until Oct 2026	Certified	[Download Cert]
Heavy Machinery Handling	Expiring in 5 Days	Due Soon	[Start E-Learning]
Hygiene Standard v2.0	Expired Yesterday	Non-Compliant	[Retake Test]

Figure 6.3: Overview of Engineer “My Training” Page

Description: shows the competency profile of the logged-in user, including assigned modules with "Certified," "Expiring," or "Non-Compliant" status indicators.

Purpose: to assist staff members in keeping an eye on their own credentials and acting before certifications expire.

The screenshot displays the QMS-FLOW application interface for logging a new customer complaint. The left sidebar features a dark blue background with a network-like pattern and contains navigation links: Dashboard, Log Complaint (which is highlighted in blue), SOP Library, My Training, and Settings. The main content area has a light gray background and shows the 'Log New Complaint' form. At the top of the form, there is a breadcrumb navigation: Dashboard > Customer Complaints > New Record. Below this, the title 'Log New Complaint' is displayed, followed by a horizontal progress bar indicating three steps: 1. Identification (the first step, shown in blue), 2. Issue Details, and 3. Evidence Upload. The 'Identification' step is currently active. The form itself contains several input fields: 'Complaint Source' (set to 'Customer Email'), 'Product Batch Number' (containing 'XXXXXX' with a green checkmark icon to its right), 'Date of Occurrence' (with a calendar icon), and 'Initial Description' (a text area with placeholder text 'Briefly brikef description of complaint.'). At the bottom right of the form are two buttons: 'Cancel' and 'Next Step' (in a blue button).

Figure 6.4: Overview of Engineer “Log Complaint” Page

Description: The complaint source, batch number, date, and a description of the problems are all included in this recommended form for reporting non-conformances.

Purpose: to ensure that all relevant information is recorded for research by standardizing data collecting.

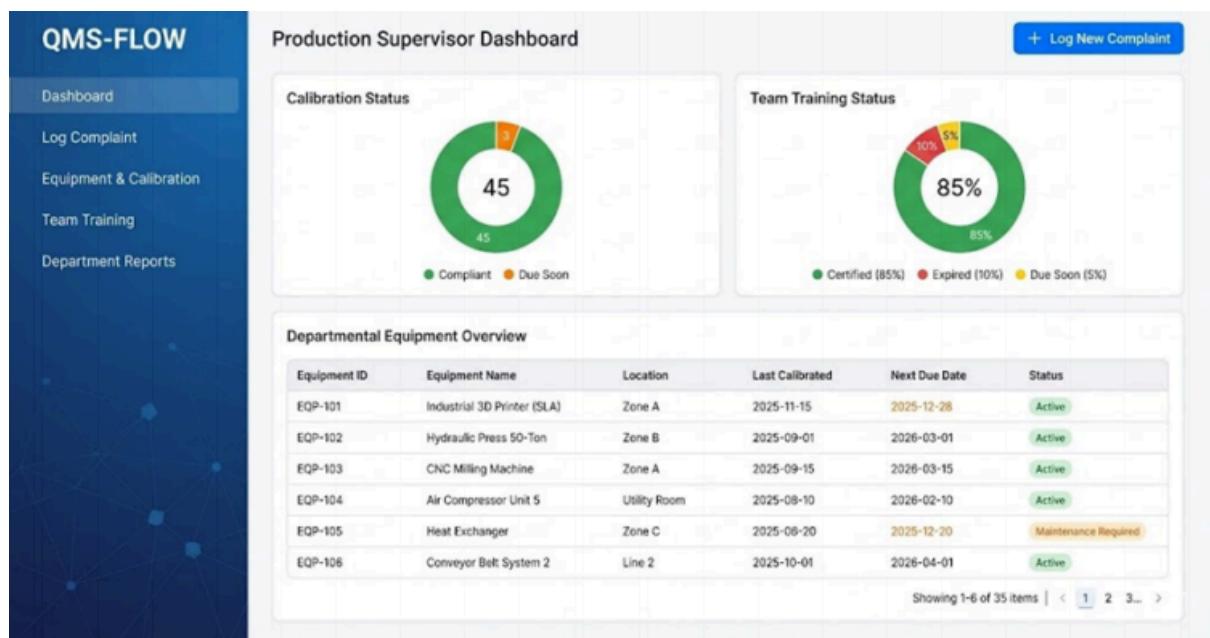


Figure 6.5: Overview of Manager Dashboard

Description: A list of equipment with "Due Soon" notifications comes after a management view that displays departmental data via charts for training and calibration.

Purpose: to give supervisors a high-level summary on the state of the department and impending deadlines.

QMS-FLOW

- Dashboard
- Log Complaint
- Equipment & Calibration
- Team Training
- Department Reports**

Departmental Performance & Records

Production KPIs **Meeting Minutes & Briefings**

Departmental Meeting Log

Filter by Type: All | Safety Talk | Shift Handover | Quality Briefing

Date	Meeting Type	Topic	Attendees	Action Items	Minutes File
2025-12-28	Shift Handover	Night Shift Target Handoff	12 Staff	Pending (2)	
2025-12-20	Toolbox Talk	Machine Guarding Safety	20 Staff	Closed	
2025-12-15	Quality Briefing	Defect Reduction Plan	8 Staff	In Progress	
2025-12-10	Shift Handover	Day Shift Handover Notes	15 Staff	Closed	
2025-12-05	Safety Talk	PPE Compliance Review	18 Staff	Closed	
2025-11-28	Quality Briefing	New SOP Introduction	22 Staff	Pending (1)	
2025-11-20	Shift Handover	Weekend Production Plan	10 Staff	Closed	

Showing 1-7 of 35 entries | < 1 2 3... >

Figure 6.6: Overview of Manager “Department Reports” Page

Description: A digital diary that keeps track of internal communications like "Shift Handover" and "Safety Talks," along with meeting minutes and attendance statistics.

Purpose: to maintain continuity across shifts and produce a traceable record of operational briefings.

All Assets	Due < 30 Days	Out of Service	Calibration Overdue			
Asset ID	Equipment Name	Serial No.	Last Calibrated	Next Due	Status	Certificate
EQP-101	Industrial 3D Printer	SN-9982	2025-01-15	2026-01-15	Valid	
EQP-105	Heat Exchanger Unit	SN-4421	2024-12-20	2025-12-20	Expiring	
EQP-109	Conveyor Motor B	SN-1102	2024-06-01	2025-06-01	Non-Compliant	
EQP-112	CNC Lathe Machine X1	SN-8875	2025-01-20	2026-01-20	Valid	
EQP-118	Digital Caliper Set	SN-3321	2024-07-15	2025-07-15	Valid	
EQP-121	Air Compressor 500L	SN-1144	2024-11-30	2025-05-30	Valid	
EQP-125	Hydraulic Press 20T	SN-5582	2023-12-01	2024-12-01	Non-Compliant	
EQP-130	Oven (High Temp)	SN-9902	2025-02-01	2026-02-01	Valid	
EQP-134	Microscope (Optical)	SN-6678	2024-12-28	2025-12-28	Expiring	
EQP-141	Tensile Tester	SN-7721	2025-01-10	2026-01-10	Valid	

Showing 1-10 of 250 items | < 1 2 3 ... >

Figure 6.7: Overview of Manager “Equipment & Calibration” Page

Description: a thorough inventory of all departmental assets, with calibration dates and status badges such as "Valid," "Expiring," or "Non-Compliant" displayed.

Purpose: to keep track of maintenance schedules in order to avoid using uncalibrated equipment.

Staff ID	Name	Role	Assigned Training	Completion Date	Expiry Date	Status
OP-001	Ali Ahmad	Operator	Safety Lvl 1	2025-10-10	2026-10-10	Certified
OP-004	Sarah Lee	Packer	Hygiene Protocols	2023-05-20	2025-05-20	Expired Action Required
OP-005	Raj Kumar	Technician	Machine Maintenance	2025-11-01	2026-11-01	Certified
OP-008	Mei Ling	Quality Inspector	QMS Auditing Basics	2024-12-15	2026-12-15	Certified
OP-012	David Chen	Forklift Driver	Advanced Forklift Safety	2024-08-01	2025-08-01	Expired Action Required
OP-015	Fatima Hassan	Assembly Line	ESD Control	2025-09-30	2026-09-30	Certified
OP-019	Kenji Tanaka	Supervisor	Leadership in Safety	2023-11-20	2025-11-20	Expired Action Required
OP-022	Elena Petrova	Operator	Chemical Handling	2025-01-10	2026-01-10	Certified

Showing 1-8 of 20 items | < 1 2 3 >

Figure 6.8: Overview of Manager “Team Training Matrix” Page

Description: Each team member's training status is listed in a matrix, with expired certifications highlighted in red for prompt attention.

Purpose: to determine skill gaps and guarantee the workforce's continued competence and compliance.



Figure 6.9: Overview of Admin / Manager Dashboard

Description: Important KPIs like "Open CAPAs" and "Compliance Score," as well as a list of urgent approval activities, are displayed in the system command center.

Purpose: to prioritize high-risk items that need management action and to offer strategic monitoring.

The screenshot shows the QMS-FLOW CAPA Management interface. On the left, a sidebar lists navigation options: Dashboard, CAPA Management (which is selected and highlighted in blue), Audit Schedules, Management Review, and Reports. The main content area is titled "Case #CMP-2025-882: Machine Overheating" and has a status of "In Progress". A header bar at the top of the content area displays "Reported By: Operator A | Date: 12-Oct-2025 | Severity: High | Department: Production". Below this, the "Root Cause Analysis" section is shown, with the methodology set to "Fishbone Diagram". The "Root Cause Description" field contains a detailed text about a sensor failure due to prolonged exposure to high temperatures. The "Evidence" section includes two attachments: "thermal_log.pdf" (PDF file) and "photo_evidence.jpg" (image file). Finally, the "Corrective Action Plan" section lists two tasks: "Replace Temp Sensor" assigned to the Maintenance Team with a due date of 20-Oct-2025 and a status of "Pending", and "Recalibrate Machine 5" assigned to an External Vendor with a due date of 22-Oct-2025 and a status of "Scheduled".

Figure 6.10: Overview of Admin / Manager “CAPA Management” Page

Description: An investigative management workflow screen containing a "Corrective Action Plan" with tasks and a "Root Cause Analysis" section.

Purpose: to record the examination and fixing of non-conformances in accordance with ISO guidelines.

The screenshot shows the QMS-FLOW interface. On the left is a dark blue sidebar with the title 'QMS-FLOW' and a navigation menu including 'Dashboard', 'CAPA Management', 'Audit Schedules', 'Management Review' (which is highlighted in light blue), and 'Reports'. The main content area has a white background. At the top, it says 'Management Review Meetings' and features a blue button with a '+' icon labeled '+ Schedule New Meeting'. Below this, a section titled 'Next Scheduled Review: Q4 2025' displays the date '15-Dec-2025', organizer 'Quality Manager', and status 'Agenda Finalized'. It also includes an 'Agenda Preview' list with four items: 'Review of Quality Policy & Objectives ...', 'Customer Satisfaction Survey Results ...', 'Audit Findings Summary ...', and 'Resource Allocation Review ...'. Two buttons, 'Edit Agenda' and 'View Minutes', are located below this preview. A section titled 'Past Meeting History' follows, containing a table with five rows of meeting data:

Date	Meeting Name	Status	Actions
15-Sep-2025	Q3 2025 Review	Completed	View Minutes
15-Jun-2025	Q2 2025 Review	Completed	View Minutes
15-Mar-2025	Q1 2025 Review	Completed	View Minutes
15-Dec-2024	Q4 2024 Review	Completed	View Minutes
15-Sep-2024	Q3 2024 Review	Completed	View Minutes

Figure 6.11: Overview of Admin / Manager “Management Review” Page

Description: An executive review scheduling interface that shows the agenda for the upcoming meeting and a list of previous reviews that have been finished.

Purpose: to lead sessions for strategic planning and ongoing improvement.

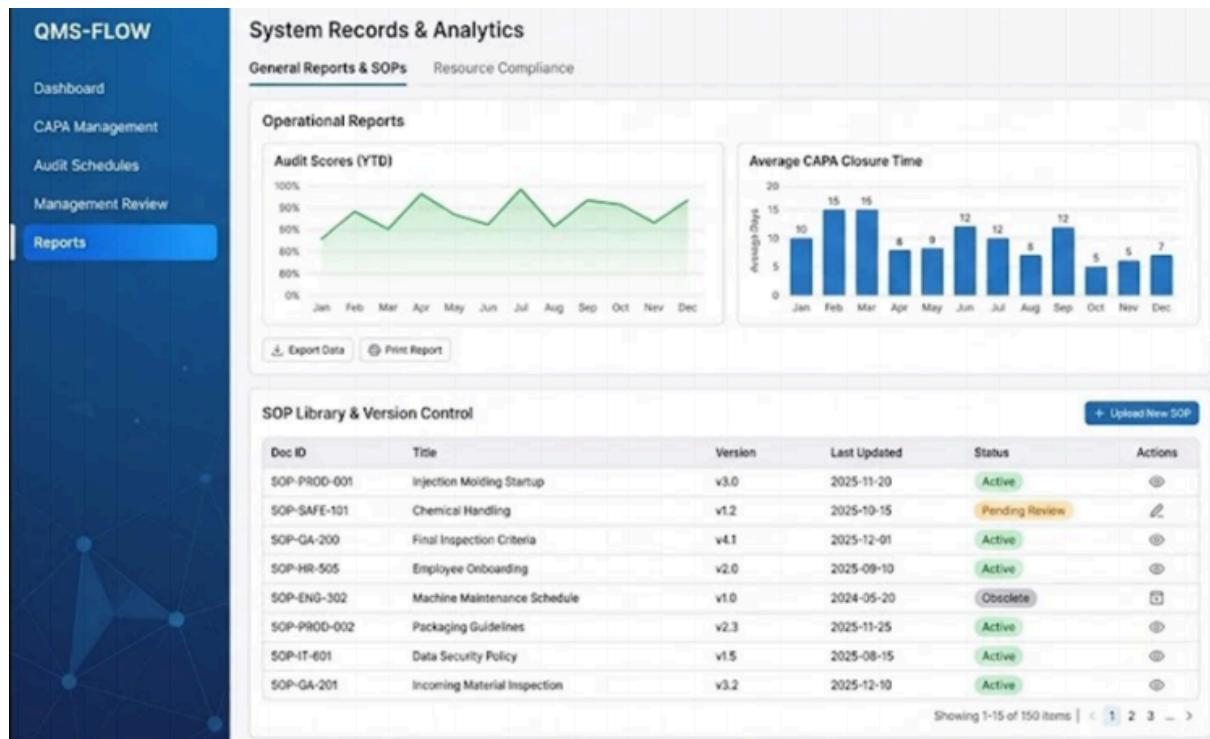


Figure 6.12: Overview of Admin / Manager “General Reports & SOPs” Page

Description: a unified view with the "SOP Library" with version control at the bottom and operational analytics charts at the top.

Purpose: to track versions of system documentation and examine trends in quality.

The screenshot shows a split-screen interface for 'System Records & Analytics'. On the left, a sidebar menu includes 'Dashboard', 'CAPA Management', 'Audit Schedules', 'Management Review', and 'Reports' (which is highlighted). The main area displays two tables: 'Equipment Calibration Status' and 'Staff Training Matrix'.

Equipment Calibration Status

ID	Name	Last Calibrated	Next Due	Status
EQP-101	3D Printer	2024-12-28	2025-12-28	Active
EQP-105	Heat Exchanger Unit	2024-12-20	2025-12-20	Active
EQP-109	Conveyor B	2023-06-01	2024-06-01	Overdue ⚠
EQP-112	CNC Lathe Machine X1	2025-01-20	2026-01-20	Active
EQP-118	Digital Caliper Set	2024-07-15	2025-07-15	Active
EQP-121	Air Compressor 500L	2024-05-30	2025-05-30	Active
EQP-125	Hydraulic Press 20T	2023-12-01	2024-12-01	Overdue ⚠

Staff Training Matrix

Staff Name	Role	Certification	Expiry Date	Status
Ali Ahmad	Operator	Safety Lvl 1	2026-10-10	Valid
Sarah Lee	Packer	Hygiene Protocols	2025-05-20	Expired ⚠
Raj Kumar	Technician	Machine Maintenance	2026-11-01	Valid
Mei Ling	Quality Inspector	QMS Auditing Basics	2026-12-15	Valid
David Chen	Forklift Driver	Advanced Forklift Safety	2025-08-01	Expired ⚠
Fatima Hassan	Assembly Line	ESD Control	2026-09-30	Valid
Kenji Tanaka	Supervisor	Leadership in Safety	2025-11-20	Expired ⚠

Figure 6.13: Overview of Admin / Manager “Resource Compliance” Page

Description: A split-screen display that simultaneously tracks "Staff Training" and

"Equipment Calibration" to identify compliance issues throughout the factory

Purpose: to check compliance of people's training and equipment calibration from a single perspective.

Top Section (Visual Schedule)

January 2025											
Sun	Mon	Tue	Wed	Thu	Fri	Sat					
30	31	1	2	3	4	5	6	7	8	9	10
				EXT-2025-01 External			11	12	13	14	
	14	15	16	AUD-2025-01 Internal		19	20	21			
	21	22	23	24	25	26	27	28	29	30	
					AUD-2025-02 Internal						

Legend: Internal Audit (Blue), External ISO Certification (Purple), Supplier Audit (Grey)

Bottom Section (Detailed List)

Upcoming Audits List						
Audit ID	Target Department	Lead Auditor	Scheduled Date	Status	Actions	
AUD-2025-01	Production Line A	John Smith (Internal)	15-Jan-2025	Confirmed	View Plan	Edit Scope
AUD-2025-02	HR & Training	Jane Doe (Internal)	20-Feb-2025	Planning	Edit Scope	View Agenda
EXT-2025-01	ISO 9001 Surveillance	SOS External	10-Mar-2025	Scheduled	View Plan	Edit Scope
AUD-2025-03	Quality Control Lab	Emily Davis (Internal)	22-Jan-2025	Confirmed	View Plan	Edit Scope
SUP-2025-01	Component Supplier X	Mark Wilson (Internal)	05-Mar-2025	Planning	Edit Scope	View Agenda

Figure 6.14: Overview of Admin / Manager “Audit Schedules” Page

Description: a planning screen with a comprehensive list of upcoming internal and external audits as well as a visual calendar for the annual audit program.

Purpose: to guarantee that the audit program is organized and carried out on time.

The screenshot shows the QMS-FLOW Auditor Dashboard. On the left, there is a sidebar with a blue header "QMS-FLOW" and a white "Dashboard" button. Below it are links: "Complaint History (View)", "CAPA Records (View)", "Training Matrices (View)", and "Audit Trails". The main area has a yellow banner at the top stating "VIEW ONLY MODE: You have read-only access for verification purposes." Below this is a table titled "Recent System Activity Log for Verification". The table has columns: "Timestamp", "User Role", "Action Taken", "Record ID", and "Action". It lists four entries:

Timestamp	User Role	Action Taken	Record ID	Action
2025-10-27 10:15 AM	Supervisor	Updated Calibration Record	EQP-101	View Details
2025-10-27 09:45 AM	Quality Manager	Approved CAPA Plan	CAPA-2025-001	View Details
2025-10-26 04:30 PM	Production Operator	Submitted New Complaint	CMP-00492	View Details
2025-10-26 03:15 PM	Training Coordinator	Added New SOP to Library	SOP-105	View Details

Figure 6.15: Overview of Auditor Dashboard

Description: a limited view with a "Read-Only" banner and completed with necessary sidebar for easy access to view necessary document and modifications and shows quick access to recent system activity log

Purpose: to provide easy access and history of recent system activity log for verification

System Audit Trail & Change Log						
READ-ONLY MODE: EXTERNAL AUDITOR						
Filter by User		Filter by Date Range		Filter by Record ID		Event Type (Create/Edit/Delete)
All Users	All Users	Start Date	End Date	Enter ID...	Event Type (Create/Edit/Del...)	Apply Filters
2025-12-28 14:30:05	Supervisor_A	Update	EQP-105	Next Due Date	2025-12-20	2026-12-20
2025-12-28 10:15:22	Admin_Main	Approval	SOP-SAFE-101	Status	Pending	Published
2025-12-27 09:05:00	Operator_Z	Login Failed	System Access	-	-	Invalid Password
2025-12-27 08:45:10	Admin_Main	Create	USR-205	User Account	-	New User Created
2025-12-26 16:20:35	Quality_Mgr	Delete	DOC-OLD-99	Document	Archived	Document Deleted
2025-12-26 15:10:05	Supervisor_B	Update	TRN-REC-55	Completion Date	2025-12-25	2025-12-26
2025-12-26 11:05:44	System_Auto	System Event	Backup	Daily Backup	Pending	Completed
2025-12-26 09:30:21	Auditor_Ext	View	CAPA-2025-08	CAPA Record	-	Record Viewed
2025-12-25 14:00:00	Admin_Main	Update	SYS-CONFIG	Timeout Setting	30 min	60 min
2025-12-25 10:00:00	Operator_Y	Login Success	System Access	-	-	Session Started
Showing 1-10 of 500+ entries < 1 2 3 4 5 ... >						

Figure 6.16: Overview of Auditor “Audit Trails” Page

Description: a limited view with a "Read-Only" banner and a complete "System Audit Trail" log that documents each user action and data modification.

Purpose: to show data integrity and make it possible for external auditors to confirm system history without making any modifications.

QMS-FLOW

Archived Record - Modification Disabled

CAPA Record #CMP-882: Machine Overheating

CLOSED

Root Cause Analysis

Fishbone Diagram Analysis

Analysis identified primary root cause as failure of thermal sensor (P/N TS-450-A) due to prolonged exposure to high operational temperatures, leading to inaccurate readings and delayed cooling system activation. Contributory factor included outdated preventive maintenance schedule for sensor replacement.

Corrective & Preventive Action Plan

Action ID	Action Description	Assigned To	Due Date	Completion Date	Status	Action
ACT-001	Replace Thermal Sensor (TS-450-A) on Machine 5	Maintenance Team	2025-10-20	2025-10-18	Completed	View Log
ACT-002	Update Preventive Maintenance Schedule for Sensors	Engineering Dept	2025-10-25	2025-10-24	Completed	View Log
ACT-003	Conduct Training on New Maintenance Procedures	Training Coordinator	2025-11-01	2025-10-30	Completed	View Log
ACT-004	Verify Effectiveness of Corrective Actions	Quality Assurance	2025-11-15	2025-11-14	Effective	View Log

Auditor Verification

I have verified this record conforms to ISO 9001 standards.

Mark as Verified

Figure 6.17: Overview of Auditor “CAPA Records” Page

Description: An "Auditor Verification" checkbox is located at the bottom of a locked view of a closed record with alteration disabled.

Purpose: To enable auditors to safely examine and confirm old data.

7 Requirements Matrix

Below is the Traceability Matrix, which is utilized as a traceability tool for the QMS FLOW System as a whole. The traceability matrix links the high-level subsystems in the QMS FLOW System (P001 to P005), as well as their use cases (UC001 to UC013), to particular elements of design, such as Sequence Diagrams and Entities. All functional requirements must, therefore, be backed by corresponding elements within these traceability matrices, thus validating the system's consistency and completeness in terms of design.

The sequence diagrams for each use case vs. corresponding classes (entities) are presented in Table 7.1.

Table 7.1: Requirements Traceability Matrix (Use Cases vs. Entities)

Persona, Use Case, Sequence Diagram	Do cu me nt	Ap pr ov al / Ch an ge	Au dit / Fin din g	C A P A	Tr ai ni ng	Equ ipm ent	Risk / Incid ent	KPI	Syst em Log	User / Ac ce ss
P002, UC001, SD001: Register Document	X								X	X

P002, UC002, SD002: Approve Document	X	X							X	X
P001, UC003, SD003: Schedule Audit			X						X	X
P001, UC004, SD004: Record Audit Findings			X						X	X
P004, UC005, SD005: Initiate CAPA			X	X			X		X	X
P004, UC006, SD006: Manage Competency				X	X				X	X

P004, UC007, SD007: Manage Equipment						X			X	X
P002, UC008, SD008: Monitor KPIs			X	X	X	X		X	X	
P002, UC009, SD009: Manage Change	X	X							X	X
P003, UC010, SD010: Provide System Support									X	X
P003, UC011, SD011: Maintain System Logs									X	X

P005, UC012, SD012: Manage Risks				X			X		X	X
P005, UC013, SD013: Manage Incident & Feedback				X			X		X	X

8 Test Cases

This is a numbered list of tests. Use tables to group similar tests. For each test, specify:

- *Test ID and name*
- *Additional description if test name is not descriptive enough*
- *The input data*
- *The expected output data*
- *The actual output data (not in the scope of this course – leave blanks)*
- *Result: pass or fail (not in the scope of this course – leave blanks)*

8.4 TC001: Test <Name of Package 1> Subsystem: <Name of Use Case (UC001)>

List all test cases before providing the details for each under each package/subsystem and use case.

This test contains the following test cases:

- (a) TC001_01: Test <Scenario of sequence diagram1 (SD001)>
- (b) TC001_02: Test <Scenario of sequence diagram2 (SD002)>
- (c) ...

8.4.2 TC001_01: Test <state scenario of sequence diagram1 (SD001)>

Provide the details for each test case in the test case template (Excel). For the scope of this course, leave blanks for the columns on actual results and pass/fail status. See the example below for better understanding. If there are alternate and exception scenarios, include respective test cases under this sub-section also.

This test contains the following alternate and exception scenarios (if any):

- (a) TC001_01_01: Test <alternate scenario1 of sequence diagram1 (SD001)>
- (b) TC001_01_02: Test <exception scenario1 of sequence diagram1 (SD001)>
- (c) ...

Test Case ID	BU_001	Test Case Description	Test the Login Functionality in Banking		
Created By	Mark	Reviewed By	Bill	Version	2.1
QA Tester's Log	Review comments from Bill incorporate in version 2.1				
Tester's Name	Mark	Date Tested	1-Jan-2017	Test Case (Pass/Fail/Not)	Pass
S #	Prerequisites:		S #	Test Data	
1	Access to Chrome Browser		1	Userid = mg12345	
2			2	Pass = df12@434c	
3			3		
4			4		
Test Scenario	Verify on entering valid userid and password, the customer can login				
Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended	
1	Navigate to http://demo.guru99.com	Site should open	As Expected	Pass	
2	Enter Userid & Password	Credential can be entered	As Expected	Pass	
3	Click Submit	Cutomer is logged in	As Expected	Pass	

8.4.3 TC001_02: Test <Scenario of sequence diagram2 (SD002)>

Provide the details for this test case.

8.4.4 TC001_n: Test <Scenario of sequence diagram n (...)>

Provide the details for this test case.

8.5 TC002: Test <Name of Package 2> Subsystem: <Name of Use Case (UC002)>

List all test cases before providing the details for the second use case in module1. Include the sub-sections accordingly.

This test contains the following test cases:

- (a) TC002_01: Test <Scenario of sequence diagram4 (SD004)>
- (b) TC002_02: Test <Scenario of sequence diagram5 (SD005)>
- (c) ...

8.6 TC003: Test <Name of Package 3> Subsystem: <Name of Use Case (UC003)>

List all test cases before providing the details for the first use case in module2. Include the sub-sections accordingly.

This test contains the following test cases:

- (a) TC003_01: Test <Scenario of sequence diagram6 (SD006)>
- (b) TC003_02: Test <Scenario of sequence diagram7 (SD007)>
- (c) ...

Appendix A: Traceability Matrix

Test Case ID	Use Case ID/ Sequence Diagram ID	Package ID
TC001 for <Name of Package 1> Subsystem <ul style="list-style-type: none">• TC001_01• TC001_02	UC001 <ul style="list-style-type: none">• SD001• SD002	P001
TC002 for <Name of Package 2> Subsystem <ul style="list-style-type: none">• TC002_01• TC002_02	UC002 <ul style="list-style-type: none">• SD004• SD005	P001
TC003 for <Name of Package 3> Subsystem <ul style="list-style-type: none">• TC003_01• TC003_02	UC003 <ul style="list-style-type: none">• SD006• SD007	P002
...		