Document Status: Approved

Approved by : Management Representative
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Revision / Document History

Version	Date	Changed by	Modifications
1.0.0	30-June-2025	Srigowri N	Project Kick Start

List of Abbreviations

DFD	**D**ata **F**low **D**iagram
ER	**E**ntity **R**elationship
RS	**R**equirement **S**pecification

Table of Contents

1. Introduction

1.1 Purpose

The purpose of the Claim Processing System is to develop a robust, user-friendly, and efficient web application using React that streamlines the entire insurance claim lifecycle for Sun Health and Allied Insurance. This system aims to automate and simplify the submission, validation, tracking, and approval of insurance claims by providing a centralized platform for all stakeholders including claimants, insurance coordinators, claims officers, medical reviewers, and approvers.

The system will enhance operational efficiency, reduce manual errors, improve transparency, and speed up claim settlements, thereby increasing customer satisfaction and trust. By integrating role-based access and workflow automation, the project seeks to ensure secure and compliant handling of sensitive claim data while supporting timely decision-making.

1.2 Scope

The Claim Processing System will cover the following key functionalities and features:

- **Claim Submission:** Enable Claimants, Policy Holders, and Insurance Coordinators to submit new insurance claims digitally with necessary documentation and proofs.
- **Claim Tracking:** Allow users to track the real-time status of their claims through an intuitive dashboard.
- **Claim Validation:** Facilitate Claims Processing Officers to validate claims, perform documentation checks, and detect potential fraud.
- **Medical Verification:** Provide Medical Practitioners and Internal Medical Reviewers with tools to verify treatment authenticity and submit medical proofs.
- **Claim Approval:** Support Claims Approvers, Managers, and Regional Heads in reviewing and granting final approval for high-value claims, including escalation and revalidation workflows in case of conflicts.
- **User and Role Management:** Allow System Administrators to manage user accounts, assign roles, and configure system settings to ensure secure and appropriate access.
- **Notifications and Alerts:** Implement automated notifications to keep stakeholders informed about claim status changes, approvals, or required actions.
- **Reporting and Analytics:** Generate reports for performance monitoring, fraud detection, and operational insights.

1.3 Definitions, Acronyms and Abbreviations

CPS - Claims Processing System
CRUD - Create Read Update Delete

1.4 References

Records from Sun Health and Allied Insurance

1.5 Coordinators

1. Naveenkumar Kandala
2. Roopesh Burra
3. Srigowri N

2. Software Requirements

2.1 Operational Requirements

1. **System Availability:** The system shall be available 24/7 with minimal downtime to support continuous claim submission and processing by users across different time zones.
2. **Scalability:** The system must scale horizontally to accommodate increasing numbers of users and claims without degradation in performance, ensuring smooth processing during peak periods.
3. **Security and Compliance:** The system shall enforce robust authentication and authorization mechanisms to protect sensitive claim and user data.
4. **Performance:** The system should provide fast response times for all user interactions, including claim submission, status tracking, and document uploads. Backend processing must be optimized for quick validation and approval workflows.
5. **Auditability:** Maintain detailed logs and audit trails of all claim-related activities, including submissions, validations, approvals, and rejections, to support compliance audits and fraud investigations.
6. **User Management:** System administrators must be able to manage users, assign roles, and configure system parameters to ensure appropriate access control and operational flexibility.
7. **Integration:** The system should integrate seamlessly with external services such as fraud detection tools, payment gateways, medical verification databases to enhance processing accuracy and efficiency.
8. **Backup and Recovery:** Implement regular data backups and disaster recovery procedures to prevent data loss and ensure business continuity.
9. **Monitoring and Alerts:** Continuous monitoring of system health and performance metrics with proactive alerting for failures or security incidents to enable rapid response

2.2 Functional Requirements

1. **Claim Submission:**
    a. Allow Claimants, Insurance Coordinators, and Policy Holders to submit new insurance claims with required details and supporting documents via a user-friendly interface.
    b. Support uploading multiple document types (images, PDFs, medical reports, receipts) with version control.
2. **Claim Tracking:**
    a. Enable users to track the status of their claims in real-time through dashboards or notifications, providing transparency and reducing inquiry calls.
3. **Claim Validation:**
    a. Claims Processing Officers shall validate claims by checking documentation completeness, verifying policy coverage, and performing fraud checks.
4. **Medical Verification:**
    a. Medical Practitioners and Internal Medical Reviewers shall verify treatment authenticity and submit medical proofs, which the system will securely store and link to claims.
5. **Claim Approval Workflow:**
    a. Claims Approvers, Managers, and Regional Heads shall review claims, especially high-value ones, and grant final approval or escalate for revalidation in case of conflicts.

6. **User and Role Management:**
    a. System Admins shall create and manage user accounts, assign roles (e.g., Claimant, Claims Officer, Medical Reviewer, Approver), and configure system settings to enforce access control and workflow rules.
7. **Automated Notifications:**
    a. Send automated alerts and updates to users about claim status changes, required actions, approvals, or rejections.
8. **Document Management:**
    a. Store and manage all claim-related documents securely with access control, search, and retrieval capabilities.
9. **Fraud Detection:**
    a. Integrate AI and analytics to detect patterns indicative of fraudulent claims and automatically route suspicious cases for further investigation.
10. **Reporting and Analytics:**
    a. Generate comprehensive reports on claim volumes, processing times, fraud incidents, and other KPIs to support operational decision-making and regulatory compliance

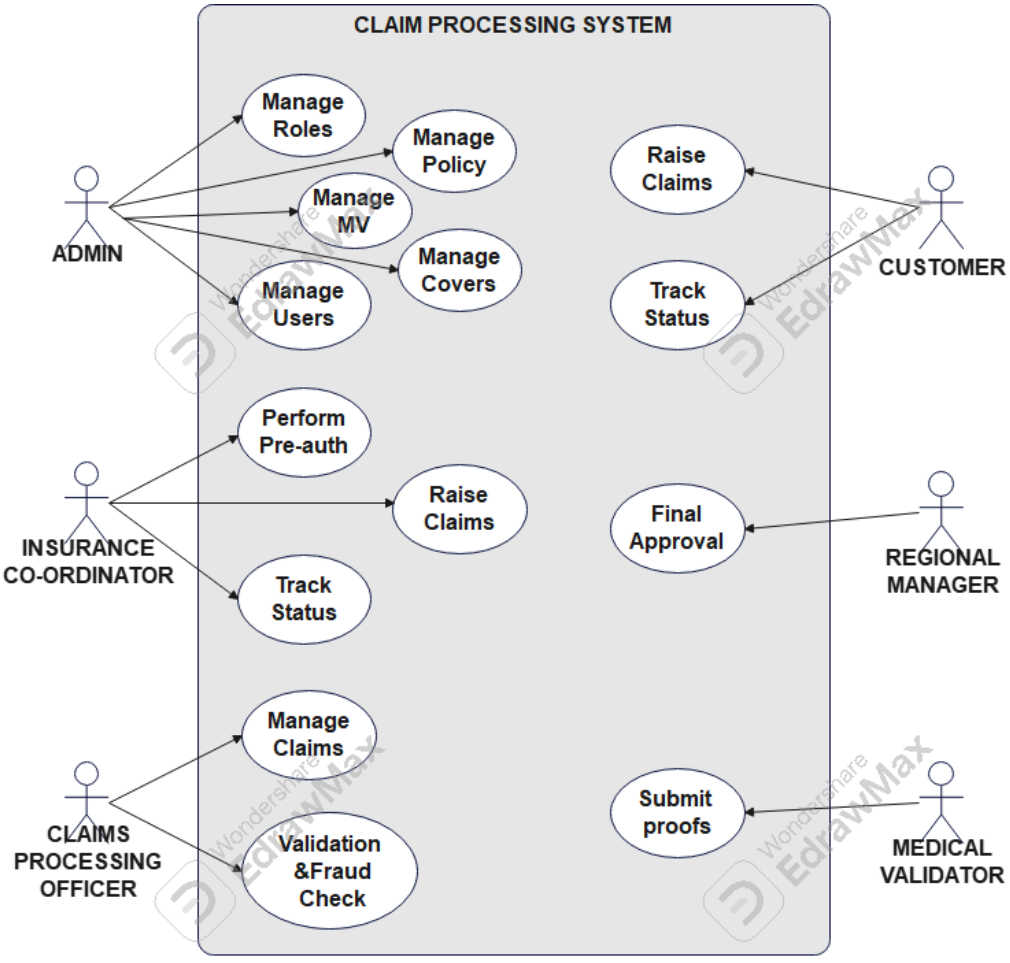

FIGURE 2.1 USE CASE DIAGRAM FOR CPS

Requirement Tag ID	*RS-1-1* [Manage Roles Details]	
Source/Trigger	*ADMIN*	
Description	*Input*	*Roles*
	Process	*Perform CRUD operation on the Roles*
	Output	*Roles details added successfully*
Validation Method	*Data Validation*	

Requirement Tag ID	*RS-1-2* [Manage User Rules]	
Source/Trigger	*ADMIN*	
Description	*Input*	*User*
	Process	*Perform CRUD operation on the User*
	Output	*User details added successfully*
Validation Method	*Data Validation*	

Requirement Tag ID	*RS-2-1* [Raise Claims]	
Source/Trigger	*Policy Holder / Customer*	
Description	*Input*	*Customer & Policy Details*
	Process	*Submit documents*
	Output	*Updates on documents & view status*
Validation Method	*Data Updation*	

Requirement Tag ID	*RS-2-2* [Track status]	
Source/Trigger	*Policy Holder / Customer*	
Description	*Input*	*Customer & Policy Details*
	Process	*Track Status*
	Output	*Final Approval with amount / claim reject status*
Validation Method	*Data Updation*	

Requirement Tag ID	*RS-3-1* [Raise Claims]	
Source/Trigger	*Insurance Co-ordinator*	
Description	*Input*	*Customer & Policy Details*
	Process	*Submit documents*
	Output	*Updates on documents & view status*
Validation Method	*Data Updation*	

Requirement Tag ID	*RS-3-2* [Track status]	
Source/Trigger	*Insurance Co-ordinator*	
Description	*Input*	*Customer & Policy Details*
	Process	*Track Status*
	Output	*Final Approval with amount / claim reject status*
Validation Method	*Data Updation*	

Requirement Tag ID	*RS-4-1* [Manage Claims]	
Source/Trigger	*Claims Processing Officer*	
Description	*Input*	*Claims*
	Process	*Manage on Claims*
	Output	*Query + Notify & Set Expected Amount*
Validation Method	*Data Validation & Updation*	

Requirement Tag ID	*RS-4-2* [Approve or Reject]	
Source/Trigger	*Claims Processing Officer*	
Description	*Input*	*Claims*
	Process	*Manage on Claims*
	Output	*Approve or Reject*
Validation Method	*Data Updation*	

Requirement Tag ID	*RS-5-1* [Medical validation]	
Source/Trigger	*Medical Validator*	
Description	*Input*	*Notification*
	Process	*Submit Documents with Approval comments*
	Output	*Comments*
Validation Method	*Data Updation*	

Requirement Tag ID	*RS-6-1* [Final Approval]	
Source/Trigger	*Regional Manager*	
Description	*Input*	*Notification*
	Process	*Approve or Reject Claims*
	Output	*Comments*
Validation Method	*Data Updation*	

2.3 User Interface Requirements

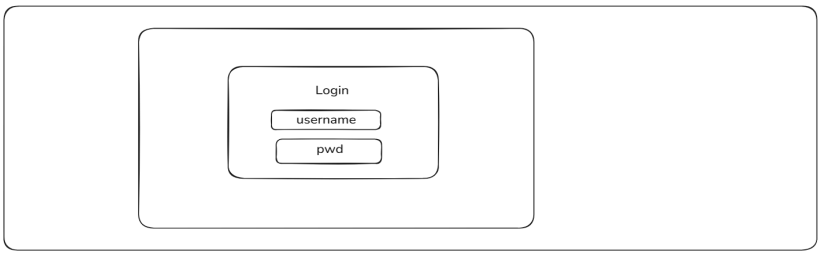

FIG 1: User Login Page

FIG 2: Admin Dashboard

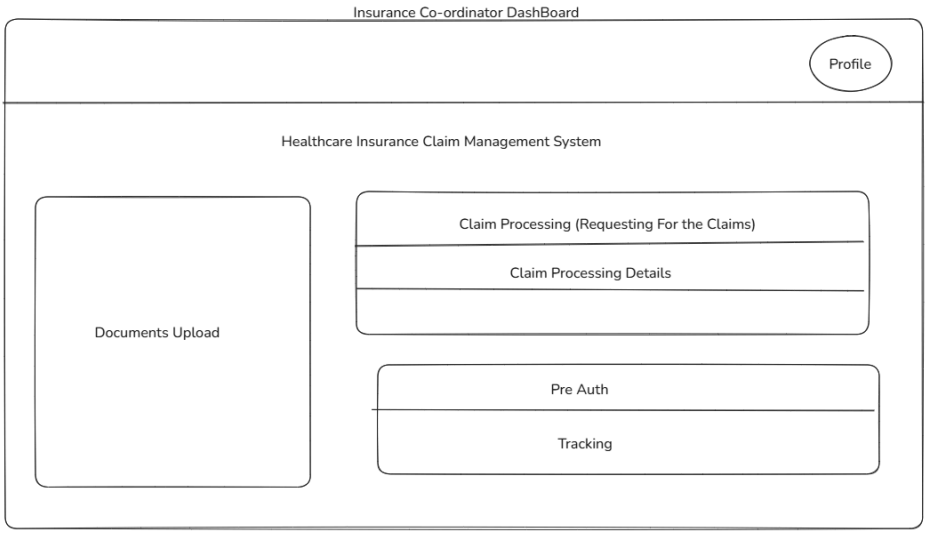

FIG 3: Insurance Coordinator dashboard

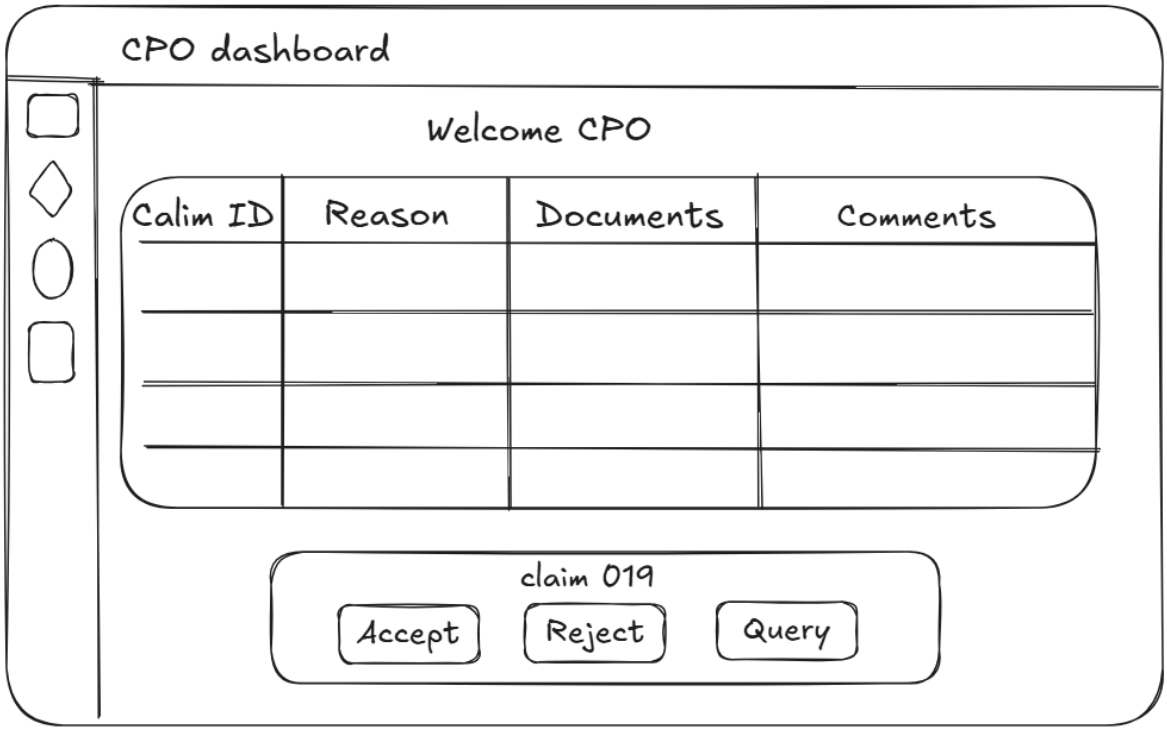

FIG 4: Claim Processing Officer Dashboard

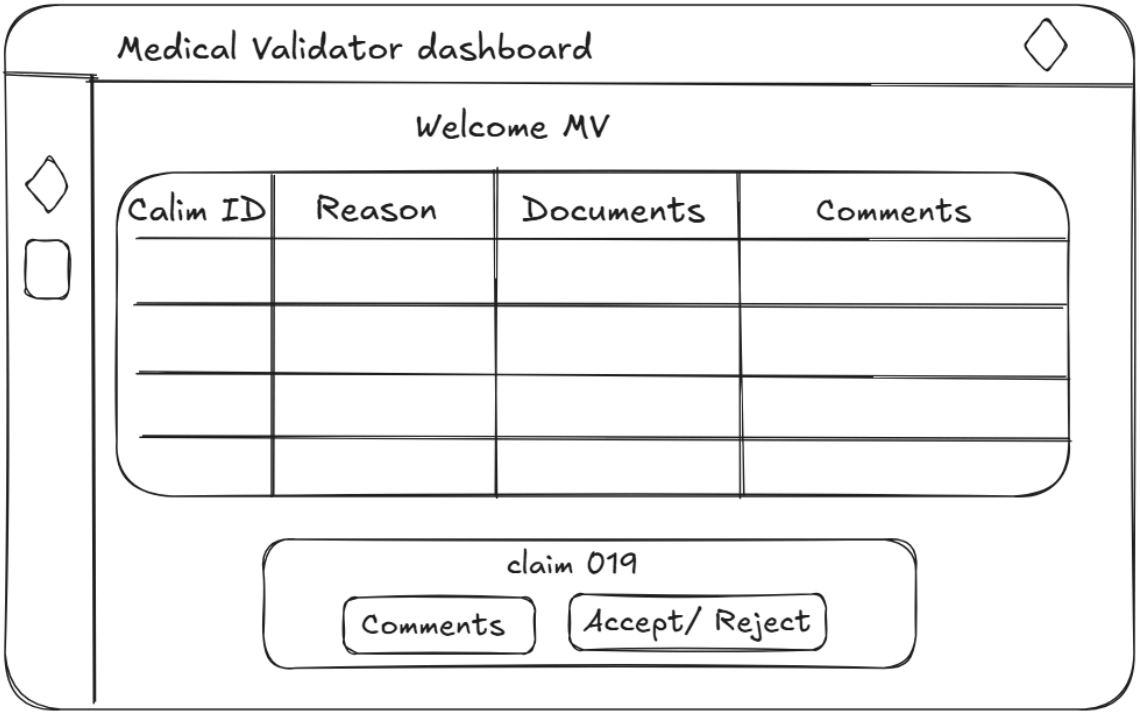

FIG 5: Medical validator Dashboard

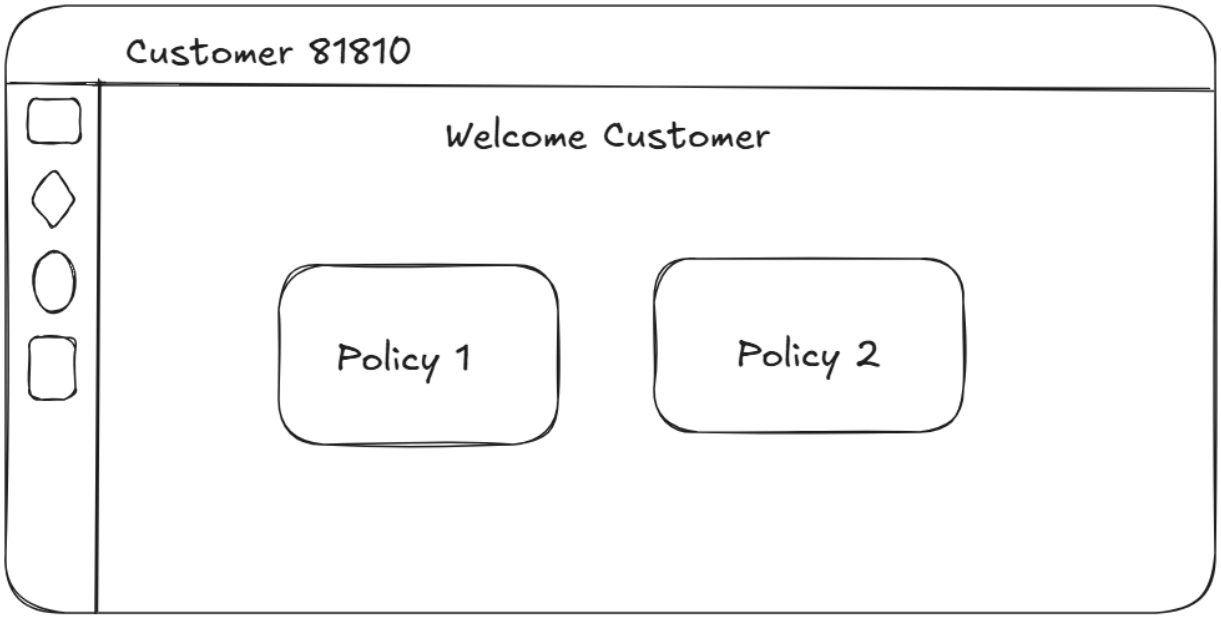

FIG 6: Customer Dashboard

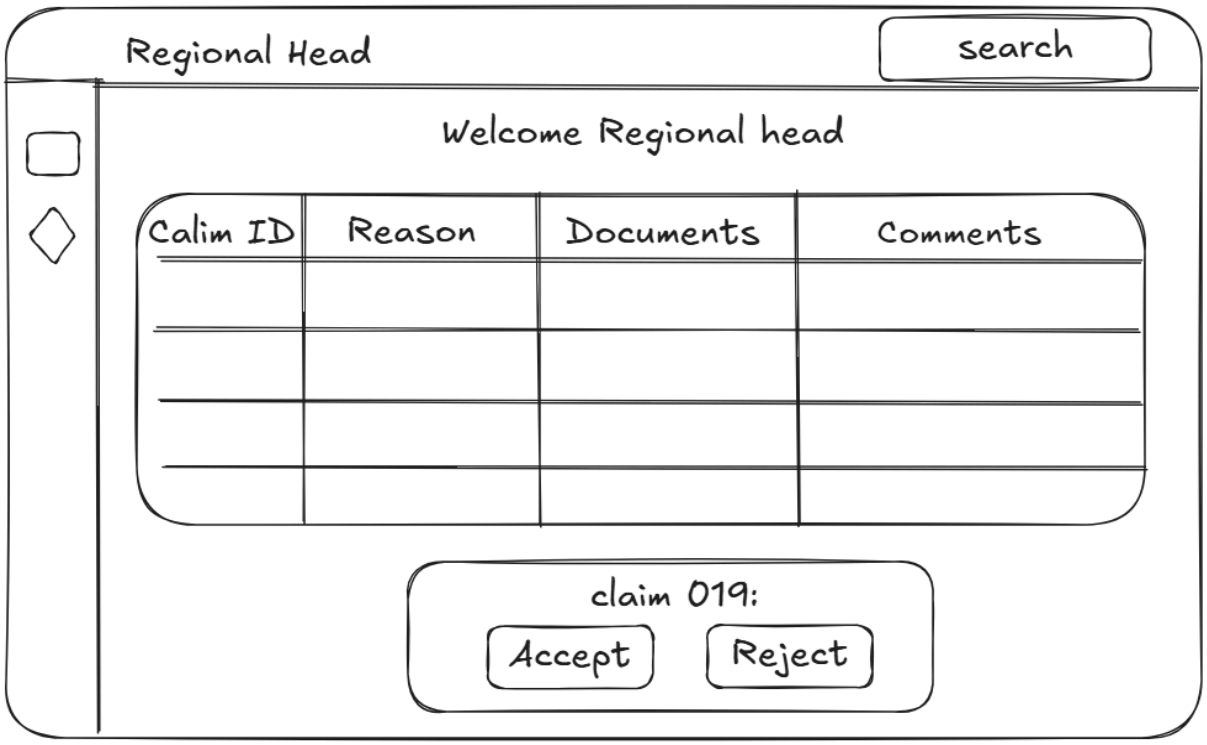

FIG 7: Regional Head Dashboard

2.4 External Interface Requirements

NA

3. Project Execution Related Requirements

3.1 Development Environment

Technologies to be used for development of the Application:

- React + material UI with version 22
- MongoDB Database

Software tools that can be used for development:

- EA (Enterprise Architect) / EdrawMax Tool
- VS Code

3.2 Design requirements

Not applicable.

3.3 Coding requirements

Technologies used include React with Material UI version 22 for building a responsive frontend, and MongoDB for flexible, scalable database management. Development tools include Enterprise Architect or EdrawMax for design and VS Code as the primary code editor. Coding requirements emphasize functional React components with hooks, Material UI theming, secure API integration, and maintainable, testable code.

Coding Standards:

- Emphasize reusable, testable React components with clear separation of concerns.
- Implement role-based access control.
- Follow best practices for input validation, error handling, and performance optimization.

3.4 Error handling requirements

NA

3.5 Resource Requirements

Technologies to be used for development of the Application:

A. **Technologies:**
   React - Frontend
   Spring - Backend
   MongoDB - Database

B. **Software Tools:**
   VS Code
   Enterprise Architect (EA)
   JDeveloper

C. **Module Allocation and Role Responsibilities**
   1. Naveenkumar Kandala - [Admin, Roles, Insurance Co-ordinator, Admin Login]
   2. Roopesh Burra - [Claims Processing Officer, Medical Validator]
   3. Srigowri N - [Policy Holder, Regional Head, Policy Holder Login]

3.6 Risk management

NA

3.7 Training Requirements

End-user training will be conducted to equip claimants, claims officers, medical reviewers, approvers, and system administrators with the necessary skills to effectively use the Claim Processing System. The training program will include hands-on sessions, role-based walkthroughs, and comprehensive user manuals to ensure users can confidently submit, validate, track, and approve claims while navigating the system efficiently.

4. Testing Requirements

A comprehensive testing strategy will be implemented to ensure the Claim Processing System meets all functional and non-functional requirements.

Unit Testing: Individual components and modules such as claim submission forms, document uploads, validation logic, and approval workflows will be tested in isolation to verify correct functionality according to design specifications.

5. Quality Assurance Activities

NA

6. Software Acceptance Criteria

The Claim Processing System (CPS) will be considered accepted upon the successful completion of User Acceptance Testing (UAT). This process involves executing the fully developed application and rigorously testing all functionalities—including claim submission, validation, tracking, approval workflows, and user management—against the specified requirements. Formal approval must be obtained from key stakeholders at Sun Health and Allied Insurance, confirming that the system meets business needs, is user-friendly, secure, and performs reliably in the intended operational environment. Only after this formal sign-off will the application be deemed ready for production deployment.

7. Deliverables

7.1 List of Deliverables

Not applicable

7.2 Delivery

Not Applicable

8. Requirements Acceptance Statement

The software will be considered acceptable when the following criteria are met:

- All documented functional requirements are implemented and pass all levels of testing.
- The system demonstrates stability and performance within defined parameters.