PROJECT REPORT
ON
CPRMS WEBSITE

SUBMITTED BY: -

NAME   M S DHEERAJ MURTHY

UNIVERSITY ROLL NUMBER.   IMT2023552

DEPARTMENT   iMTECH CSE

SESSION   2023-2028

COLLEGE   IIIT BANGALORE

TRAINING CONDUCTED

AT

CENTRAL COALFIELDS LIMITED

(CCL)

SYSTEM DEPARTMENT

DARBHANGA HOUSE

RANCHI

JHARKHAND

DURATION: 6 WEEKS

ACKNOWLEDGEMENT

I wish to extend my sincere gratitude to everyone who contributed to the development and success of the Claims Processing and Reimbursement Management System (CPRMS) for CCL. Special thanks go to the team members whose dedication and hard work made this project possible. I am deeply grateful for the support and guidance provided by CCL's management and IT departments. Their insights and feedback were invaluable in ensuring that the system meets the highest standards of functionality, usability, and security. Your collaboration and commitment have been instrumental in bringing this project to fruition. Thank you all for your contributions and support.

My project "CPRMS Website" is the outcome of the great guidance, inspiration and assurance provided by the technical staff at CCL.

I am extremely thankful to Rahul Sir and Veena Ma'am for their constant guidance and supervision given to the project. I wish my sincere thanks to them for their active help and cooperation.

DECLARATION

I hereby declare that the entire work embodied in this project has been carried out by me and no part of it has been submitted for and degree/diploma of any university/institution previously.

CERTIFICATE

This is to certify that the project on the CPRMS website with special reference to Central Coalfields Ltd., Headquarters "Darbhanga House" has been prepared by M S DEERAJ MURTHY, university roll number IMT2023552 in partial fulfillment of requirement program course iMtech (CSE Branch) Degree from International Institute of Information Technology, Bangalore under our supervision and guidance. I appreciate his skill, hard work and sense of commitment in preparation of the project.

The training period of the internship was from 11 June to 20 July 2024.

Guided By:

Rahul Sir
Sr. Manager (System dept.) CCL
Headquarter Darbhanga House
Ranchi

Table of Contents

Central Coalfields Limited

Central Coalfields Limited is a category-1 Mini Ratna Company since October 2007.During 2009 – 2010, coal production of the company reached its highest–ever figure of 47.08 million tones, with net worth amounting to Rs. 2644 crore against a paid-up capital of Rs.940 crore.

Formed on 1st November 1975, CCL (formerly National Coal Development Corporation Ltd) was one of the five subsidiaries of Coal India Ltd. which was the first holding company for coal in the country (CIL now has 8 subsidiaries).

Project Area Under CCl:

- o Barka-Sayal
- o Argada
- o North Karanpura
- o Rajhara
- o Rajrappa
- o Piparwar
- o Kathra
- o Kuju
- o Hazaribagh
- o Bokaro & Kargali
- o Dhori
- o Magadh Amrapali
- o Mines Rescue Station

1. Introduction

The CONTRIBUTORY POST RETIREMENT MEDICARE SCHEME (CPRMS) Website is an advanced web-based application developed for CCL. It is dedicated to providing health insurance benefits to its current and former employees. This innovative system revolutionizes how health insurance claims are processed, offering a seamless and efficient solution to manage the entire reimbursement process from initial submission to final approval.

1.1 Purpose

The CPRMS project serves as a pivotal tool for CCL to streamline and enhance the management of health insurance claims for its employees. By migrating from a legacy PHP system to a Java-based web framework, the project aims to modernize and optimize the claims processing workflow. It provides a user-friendly interface for employees to submit claims and for designated personnel—such as pharmacists, accountants, and medical officers—to efficiently review, process, and approve applications. The system's integration of OTP authentication and SMS notifications via Twilio ensures secure and transparent communication throughout the reimbursement process. Ultimately, the CPRMS empowers CCL to deliver prompt, accurate, and reliable healthcare benefits to its workforce, reinforcing the company's commitment to employee well-being and operational excellence.

1.2 Scope

The CPRMS supports a comprehensive workflow that involves multiple roles, each with specific responsibilities and permissions. From the moment an application is registered at the reception desk, it passes through several stages involving pharmacists, accountants, Chief Medical Officers (CMO), Chief Medical Supervisors (CMS), and data entry operators

before reaching final approval. This structured process ensures that each claim is thoroughly reviewed and handled with the utmost care and accuracy.

Moreover, the system features a super user role, providing overarching access and management capabilities across all types of applications. This role enhances administrative oversight and ensures that any issues can be swiftly addressed.

1.3. Benefits

Designed to replace the legacy PHP system, the new CPRMS leverages modern web technologies and robust backend architecture to deliver a superior user experience. The system uses a Java web framework, incorporating HTML, CSS, and JavaScript for the front end, Java with Servlets for the backend, and MySQL for database management. Additionally, it integrates Twilio's API for SMS notifications, ensuring secure and timely communication with users through OTP authentication.

By modernizing the claims process, CPRMS significantly improves operational efficiency, reduces processing time, and enhances user satisfaction. It exemplifies how technology can streamline administrative tasks and provide better service to employees, ultimately supporting CCL's commitment to health and wellness.

1.4 Definitions, Acronyms and Abbreviations

- IntelliJ IDEA is an Integrated Development Environment (IDE) for Java and Kotlin designed to maximize developer productivity.
- MySQL is an Oracle-backed open-source relational database management system (RDBMS) based on Structured Query Language (SQL).
- CPRMS: CONTRIBUTORY POST RETIREMENT MEDICARE SCHEME
- CCL: Central Coalfields Limited

1.5 Project Overview

The following subsections provide the complete overview of the software specifications and requirements and documentation for the CPRMS website. The entire website is documented in the Screen Capture sections of the report to give a complete outlook of the software, its perspectives, features, and system requirements so that users know how to use it effectively.

2. Overall Description

2.1 Product Perspective

The CPRMS represents a significant upgrade from the previous PHP-based system, positioning itself as a robust and scalable solution within CCL's healthcare benefits infrastructure. As a comprehensive claims processing and reimbursement management system, it interfaces seamlessly with existing databases and systems, leveraging modern technologies like Java, Servlets, and MySQL. This integration ensures compatibility with future enhancements and expansions, supporting CCL's evolving needs in healthcare administration. The system's modular architecture allows for easy customization and integration of additional features, such as enhanced reporting capabilities or extended user roles, fostering continuous improvement and adaptation to industry standards. By enhancing efficiency, transparency, and user experience, the CPRMS not only meets current operational demands but also lays a foundation for future advancements in healthcare benefits management at CCL.

2.2 Product Functions

- **2.2.1 Super User Module**

- o View applications list
- o View applications at different stages of the application approval process
- o Search through applications
- o View individual applications. forward / shortfall application
- o Register users/employees into the system
- o View all users of the system
- o View application including the data entered, current status of the application as well as history of the application

- **2.2.2 Normal User Module**
  - o View applications to be considered the relevant user
  - o Forward/shortfall application
  - o Sort or Search through applications
  - o View application including the data entered, current status of the application as well as history of the application

- **2.2.3 Reception Desk User Module**
  - o Register new application
  - o 2.2.4 Applicant Module
  - o View all applications registered by the applicant
  - o View application including the data entered, current status of the application as well as history of the application

2.3 User Characteristics

- **2.3.1 Super User**
  - o No specific knowledge required by the Super user.
  - o Super users should have basic knowledge about computer operations and databases.

- **2.3.2 Normal User**
  - o No specific knowledge required by the normal user.
  - o Normal users should have a basic knowledge of computer operations and databases.

- **2.3.3 Reception Desk User**
  - o No specific knowledge is required by the Receptionist.
  - o The receptionist should have a basic knowledge of computer operations and databases.

- **2.3.4 Applicant**
    - No specific knowledge is required by the Applicant user.
    - Applicant users should have a basic knowledge of computer operations and databases.

2.4 Assumptions and Dependencies

Assumptions

- The code should be free of compilation/syntax errors.
- The product must have an interface that is simple enough to understand

Dependencies

- Java Development Kit (JDK)
    - Required for compiling and running Java code. Ensure compatibility with the version used in your project.
- Apache Maven (or Gradle):
    - Dependency management and automation tool building. Maven pom.xml or Gradle build.gradle files will specify project dependencies.
- Servlet Container (e.g., Apache Tomcat):
    - Server for running Java Servlets. Ensure compatibility with the Servlet API version used in your project.
- 4. MySQL Database:
    - Database management system for storing application data and user information. Make sure MySQL is installed and configured correctly.
- Twilio Java Helper Library:
    - If using Twilio for SMS notifications, include the Twilio Java SDK or Twilio Java Helper Library as a dependency in your project.
- Java EE APIs:
    - Depending on the Java EE specifications used (e.g., Servlet API, JSP API), ensure these APIs are included and compatible with your Servlet container.
- HTML/CSS/JavaScript Libraries:
    - Typically included directly in your project's frontend codebase (HTML, CSS, JavaScript files).
- Additional Java Libraries or Frameworks:

- o Any additional Java libraries or frameworks used in your project (e.g., logging frameworks like Log4j, testing frameworks like JUnit).
- Database Connector (JDBC):
  - o JDBC driver for MySQL to establish a connection between your Java application and the MySQL database.
- Security Libraries (Optional):
  - o Depending on security requirements, include libraries for encryption, authentication, and authorization (e.g., Spring Security).

3. Specific Requirements

3.1 External Interface Requirements

For Developers

- **Software Requirements**
  - o IntelliJ IDEA 2024 (Ultimate edition)
  - o Java Development Kit JDK 22
  - o Apache Tomcat 10.1.24
  - o Database Management system - MySQL
  - o MySQL connector 8.4.0
  - o Web Browser: Mozilla Firefox, Google Chrome, Brave
  - o Operating system: Windows XP or later, Mac OS, Linux
- **Hardware Requirements**
  - o Processor: Pentium V or above
  - o Hard Disc - Minimum 2GB of free space required
  - o RAM - Minimum of 512 MB RAM
  - o Internet connection

For Users

- **Software Requirements**
  - Web Browser: Mozilla Firefox, Google Chrome, Brave
  - Operating system: Windows XP or later, Mac OS, Linux
- **Hardware Requirements**
  - Processor: Pentium V or above
  - Hard Disc - Minimum 2GB of free space required
  - RAM - Minimum of 512 MB RAM
  - Internet connection

3.2 Functional Requirements

- **User Registration and Management:**
  - Users (employees) should be able to register and manage their accounts securely.
  - Different roles (pharmacists, accountants, CMO, CMS, data entry operators, super user) should have specific permissions and capabilities.
- **Application Submission and Tracking:**
  - Employees should be able to submit health insurance claims through the system.
  - Applications should be tracked through various stages (reception, pharmacy, accounting, medical officer reviews, data entry, approval).
- **Role-Based Access Control:**
  - Each role should have access only to the functionalities and data relevant to their responsibilities.
  - Super users should have overarching access to all functionalities and data.
- **Authentication and Authorization:**
  - Secure login mechanisms should be implemented, including OTP (One-Time Password) authentication for added security.
  - Authorized checks should enforce access control based on user roles and permissions.

- **SMS Notifications:**
  - Integration with Twilio or similar services to send SMS notifications for application updates, approvals, or requests for additional information.
- **Data Management and Reporting:**
  - Ability to store and manage application data securely in a MySQL database.
  - Generate reports on application status, processing times, and other metrics as needed.
- **Workflow Automation:**
  - Automated assignment of applications to respective roles (pharmacists, accountants, etc.) based on predefined rules or workload balancing.
- **Audit Trail and Logging:**
  - Maintain an audit trail of actions performed on applications for accountability and compliance purposes.
  - Logging of system activities and errors for monitoring and troubleshooting.
- **User Interface (UI) and User Experience (UX):**
  - Intuitive and user-friendly interfaces for all user roles to facilitate easy navigation and use of the system.
  - Responsive design to support access from various devices and screen sizes.
- **Integration with Existing Systems:**
  - Ability to integrate with existing systems within CCL's IT infrastructure, ensuring data consistency and operational efficiency.

3.2 Performance Requirements

- **Response Time:**
  - Requirement: The system should respond to user interactions (e.g., login, application submission, application approval) within 2 seconds under normal operating conditions.
- **Throughput:**
  - Requirement: The system should support processing of at least 100 applications per hour during peak usage times.
- **Concurrency:**
  - Requirement: The system should support concurrent access by multiple users, with at least 100 active sessions simultaneously.

- **Scalability:**
  - Requirement: The system should be able to scale horizontally to accommodate an increase in user base or workload.
- **Availability:**
  - Requirement: The system should have an uptime of at least 99.9% during business hours (e.g., 8 AM to 6 PM, Monday to Friday).
- **Data Processing Time:**
  - Requirement: Applications should be processed and moved through each stage of review (pharmacy, accounting, medical officer, data entry) within 24 hours of submission.
- **Data Storage and Retrieval:**
  - Requirement: Database queries for application data should be executed within 1 second for typical queries.
- **Security and Compliance:**
  - Requirement: The system should maintain compliance with industry standards (e.g., HIPAA, GDPR) for data security and privacy.
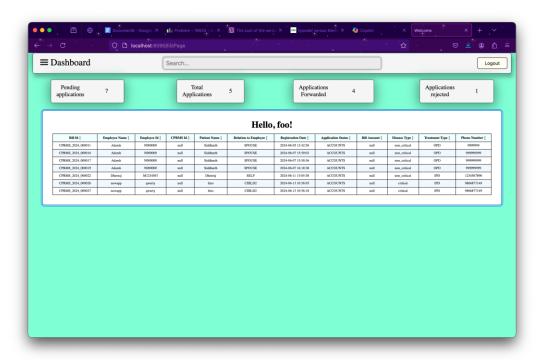
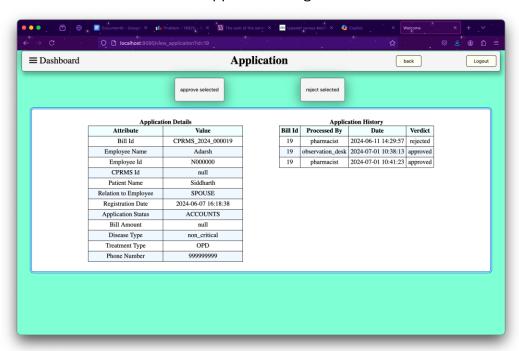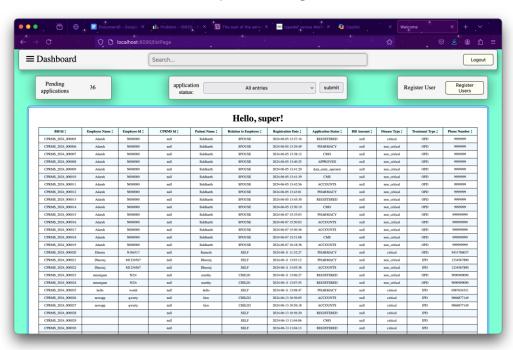# 4. Screen Captures

Common Login Page

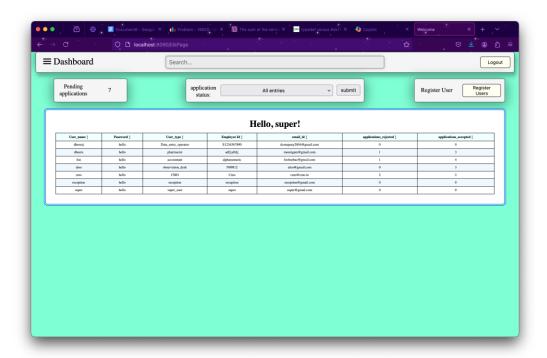User Login Page

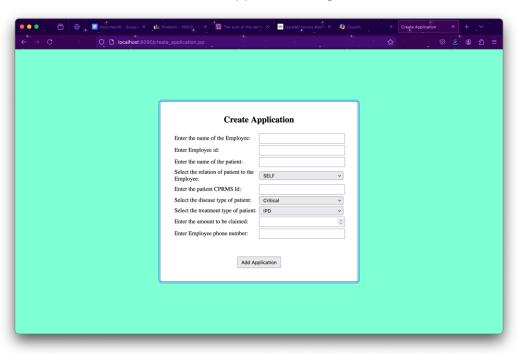## User Page (Accounts)
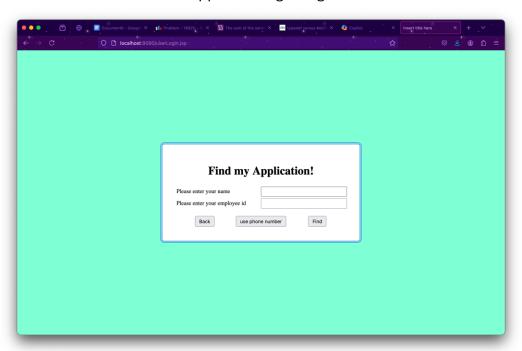

Application Page

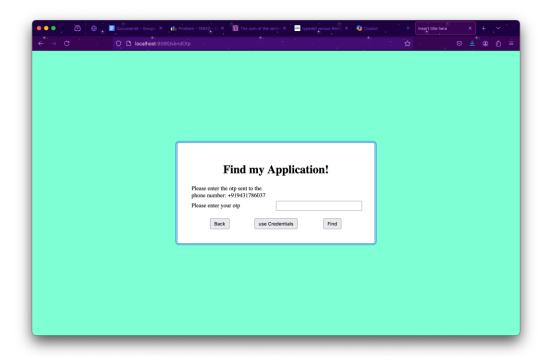Super User Page

Super User Page (show users)

Create Application Page

Applicant Login Page

Applicant Login via OTP

5. BiblioGraphy

- **Java EE Documentation**:
    - Oracle. (n.d.). *Java EE Platform*. Retrieved from https://www.oracle.com/java/technologies/java-ee-glance.html
- **Twilio API Documentation**:
    - Twilio. (n.d.). *Twilio API for SMS*. Retrieved from https://www.twilio.com/docs/sms
- **MySQL Documentation**:
    - Oracle. (n.d.). *MySQL 8.0 Reference Manual*. Retrieved from https://dev.mysql.com/doc/refman/8.0/en/
- **Servlet Documentation**:
    - Oracle. (n.d.). *Java Servlet Specification*. Retrieved from https://docs.oracle.com/javaee/7/tutorial/servlets.htm
- **HTML, CSS, and JavaScript**:
    - W3Schools. (n.d.). *HTML, CSS, and JavaScript Tutorials*. Retrieved from https://www.w3schools.com/
- **Responsive Web Design**:
    - Marcotte, E. (2010). *Responsive Web Design*. A List Apart. Retrieved from https://alistapart.com/article/responsive-web-design/
- **Role-Based Access Control (RBAC)**:
    - Sandhu, R., Coyne, E., Feinstein, H., & Youman, C. (1996). *Role-Based Access Control Models*. IEEE Computer, 29(2), 38-47.
- **OTP Authentication**:
    - OATH. (n.d.). *OATH: Initiative for Open Authentication*. Retrieved from https://openauthentication.org/
- **Logging in Java**:
    - Apache Software Foundation. (n.d.). *Apache Log4j 2 User's Guide*. Retrieved from https://logging.apache.org/log4j/2.x/manual/
- **Building and Managing Java Projects with Maven**:
    - Sonatype. (n.d.). *Introduction to Apache Maven*. Retrieved from https://maven.apache.org/guides/getting-started/index.html