

## PROJECT DOCUMENTATION

### INSURAI – AI POWERED INSURANCE ASSISTANCE SYSTEM

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#### 1. ABSTRACT

Insurance systems in many organizations still rely on manual processes for policy management, claims handling, and customer support, leading to inefficiencies and delays.

**InsurAI – AI Powered Insurance Assistance System** is a full-stack web application developed to automate and optimize insurance-related workflows using modern technologies and artificial intelligence.

The system provides role-based access for **Admin, HR, Agent, and Employee**, enabling secure authentication, policy management, claim processing, fraud detection, and AI-powered user assistance.

The application is built using **Spring Boot** for the backend, **React (Vite)** for the frontend, **MYSQL** for cloud database services, and **Cohere AI** for intelligent chatbot responses.

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#### 2. INTRODUCTION

With the growing demand for digital transformation in the insurance sector, organizations require scalable, secure, and intelligent platforms to manage insurance operations efficiently.

InsurAI addresses these needs by offering a centralized insurance portal that supports automation, analytics, and AI-driven interactions.

The system ensures:

- Faster claim processing
  - Secure role-based authentication
  - Reduced manual intervention
  - Improved user experience through AI support
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#### 3. OBJECTIVES OF THE PROJECT

- To develop a secure insurance management platform
  - To automate claim submission and tracking
  - To provide AI-powered assistance for insurance queries
  - To implement role-based dashboards for different users
  - To ensure data security using JWT authentication
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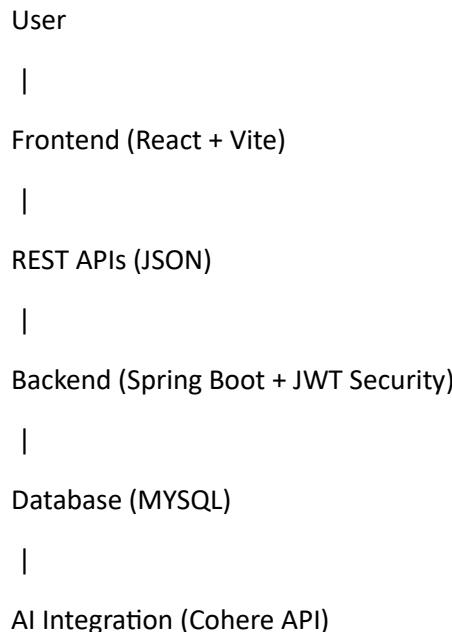
#### 4. SYSTEM ARCHITECTURE

##### 4.1 Architecture Overview

The Insurai system follows a **three-tier architecture**:

1. **Presentation Layer** – React frontend
2. **Application Layer** – Spring Boot REST APIs
3. **Data Layer** – MYSQL

#### **4.2 Architecture Diagram (Text Representation)**



### **5. TECHNOLOGY STACK**

#### **5.1 Frontend Technologies**

- React (Vite)
- JavaScript
- HTML5 & CSS3
- Axios (API integration)
- React Router (Routing)

#### **5.2 Backend Technologies**

- Java 17
- Spring Boot
- Spring Security
- JWT Authentication
- Spring Data JPA
- Hibernate ORM

### **5.3 Database**

- **MYSQL**

### **5.4 AI & Cloud Services**

- Cohere AI (Chatbot & intelligent responses)
- Supabase Storage (File handling)

### **5.5 Tools**

- Git & GitHub
- Postman
- Eclipse IDE
- Netlify

## **6. MODULE DESCRIPTION**

### **6.1 Admin Module**

- Admin login with JWT authentication
- Manage users (HR, Agent, Employee)
- View and manage insurance claims
- Fraud detection dashboard
- Audit logs and reports
- Policy management

### **6.2 HR Module**

- Employee onboarding
- Assign policies to employees
- Monitor fraud-related claims
- Generate reports and analytics

### **6.3 Agent Module**

- View assigned claims
- Resolve employee queries
- Update claim status
- Manage availability
- View reports

#### **6.4 Employee Module**

- User registration and login
- View insurance policies
- Submit insurance claims
- Track claim status
- Ask questions via AI chatbot
- View notifications and support

### **7. AUTHENTICATION & SECURITY**

- JWT-based authentication
- Role-based authorization
- Password encryption using BCrypt
- Custom authentication filters for Admin, HR, Agent, and Employee
- CORS configuration enabled
- Secure REST APIs

### **8. API TESTING**

All backend APIs were tested using **Postman**.

#### **Example: Admin Login API**

##### **Endpoint:**

POST http://localhost:8080/admin/login

##### **Request Body:**

```
{  
  "email": "admin@insurai.com",  
  "password": "Admin@123"  
}
```

##### **Response:**

```
{  
  "message": "Login successful",  
  "name": "Admin",  
  "role": "ADMIN",  
  "token": "eyJhbGciOiJIUzI1NiJ9.eyJzdWIiOiJ...  
}
```

```
"token": "<JWT_TOKEN>"  
}
```

## 9. TESTING & VALIDATION

- Backend APIs tested using Postman
- Frontend tested on live Netlify deployment
- Role-based routing validated
- JWT token validation tested
- Multiple user flows verified

## 10. ADVANTAGES OF THE SYSTEM

- Fully automated insurance workflows
- Secure authentication and authorization
- AI-powered user support
- Cloud-based scalable architecture
- User-friendly dashboards
- Real-time claim tracking

## 11. LIMITATIONS

- Backend currently runs locally (can be deployed to cloud in future)
- AI chatbot depends on external API availability
- Limited analytics customization in current version

## 12. FUTURE ENHANCEMENTS

- Cloud deployment of backend (AWS / Azure)
- Advanced AI-based fraud detection
- Mobile application integration
- Payment gateway integration
- Advanced analytics dashboards

### **13. CONCLUSION**

InsurAI is a complete AI-powered insurance assistance platform that demonstrates the practical implementation of full-stack Java development with modern frontend technologies and AI integration.

The project successfully meets its objectives by providing a secure, scalable, and intelligent solution for insurance management.

### **14. REFERENCES**

- Spring Boot Documentation
- React & Vite Documentation
- Cohere AI API Documentation