

CoverSure Mobile Application

A Privacy-First Insurance Coverage Navigator for Sri Lanka

Project in Computer Science

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1. Introduction

In Sri Lanka, insurance policies are often difficult for individuals and small business owners to understand. Many policyholders struggle with complex documents, technical jargon, and scattered records across different providers. When accidents or emergencies occur, they frequently lack clarity on what is covered, how to file a claim, or even when their policies are due for renewal.

Currently, insurance management is reactive and stressful. Users rely on paper files, memory, or insurer-specific apps that only provide limited transactional features. At the same time, concerns about privacy prevent many users from storing sensitive financial data on cloud-based systems.

This project proposes the development of CoverSure, a privacy-first mobile application designed to empower Sri Lankan insurance policyholders. The app will allow users to create a personalized 'My Coverage Plan' (MCP), supported by an on-device Coverage Coach, which provides proactive reminders and generic claim guidance using a lightweight insurance ontology stored in a Neo4j knowledge graph.

2. Problem

➤ Symptoms

1. Users forget renewal dates and premium payments.
2. Insurance documents are lengthy and full of jargon.
3. Claim processes are stressful due to lack of clarity.
4. Policy information is fragmented across multiple providers.
5. Existing insurer apps do not provide a centralized, education-focused solution.

➤ Justification (Evidence of the Problem)

- According to Sri Lanka's Insurance Regulatory Commission (IRCSL), insurance penetration is low partly because people do not fully understand their policies.
- Many Sri Lankans only engage with their insurance when a claim is required, creating stress and delays.
- Global insurance apps exist, but they rely heavily on cloud data storage, raising privacy concerns in local contexts.
- Interviews and informal feedback from policyholders highlight the need for a simple, centralized, and private solution for managing insurance.

3. Aim

To develop an AI-powered, privacy-first mobile application that empowers Sri Lankan insurance policyholders to organize their coverage, understand their policies better, and receive proactive reminders and guidance—all while ensuring that sensitive policy information remains securely stored on the user's device.

4. Objectives

1. Conduct a literature review of existing insurance apps and evaluate their shortcomings.
2. Analyze user challenges and gaps in policy management in Sri Lanka.
3. Design and develop a mobile application with:
 - A My Coverage Plan (MCP) creator.
 - A Coverage Coach (agentic AI assistant).
 - A local policy library with reminders.
 - An insurance ontology (Neo4j) for reasoning.
4. Implement advanced features such as OCR-based document parsing, family accounts, and policy analytics.
5. Evaluate the system through user testing and surveys.
6. Ensure compliance with Sri Lankan data privacy and legal frameworks.

5. Literature Review / Background

- Global Insurance Apps: Many apps provide premium payments and claim tracking but lack cross-insurer aggregation.
- Sri Lankan Context: Insurance adoption is growing, especially motor and health insurance, but digital management tools are fragmented.
- Privacy Concerns: Research shows users prefer apps that store sensitive financial data locally rather than on external servers.
- AI in Insurance: Recent studies highlight the potential of ontology-driven reasoning (Neo4j) to simplify complex insurance relationships.

6. Analysis of Existing Apps

Existing solutions (e.g., insurer apps, global financial trackers) have limitations:

- Limited scope – Focus only on their own policies.
- Cloud reliance – Raises privacy concerns.
- Lack of education – Users are not guided on what coverage means.
- Poor integration – No unified dashboard for multiple policies.

CoverSure addresses these by being insurer-agnostic, privacy-first, and education-focused.

7. Proposed Solution

CoverSure will include the following features:

1. My Coverage Plan (MCP): Users manually enter policy details (type, number, premium, expiry, coverage summary) and attach documents.
2. Coverage Coach: On-device AI agent powered by rules + Neo4j queries. Provides reminders, claim steps, and coverage clarifications.
3. Local Policy Library: Organized dashboard with statuses like 'Active' or 'Expiring Soon.'
4. Neo4j Knowledge Graph: Stores insurance ontology (policy types, coverage types, claim processes). No personal data stored in the cloud.
5. Future Enhancements: OCR auto-fill, family/group accounts, advanced analytics.

8. Motivation

insurance in Sri Lanka is often complex, with users relying on paper records or memory, leading to forgotten renewals and confusion during claims. Existing apps are provider-specific and raise privacy concerns due to cloud storage.

CoverSure is motivated by the need for a **simple, secure, and insurer-agnostic tool** that centralizes all policies, provides proactive reminders and guidance through an AI Coverage Coach, and ensures **privacy-first, local data storage** for Sri Lankan policyholders.

9. Methodology

This project follows an **Agile Incremental Development Model**, suitable for a **one-year academic project** with multiple phases. The methodology emphasizes iterative development, continuous testing, and strict adherence to a **privacy-first design principle**.

Phase 0 – Preparation (Month 1–2)

- Requirement gathering through literature review and user surveys.
- Drafting of **insurance ontology** for Neo4j (policy types, coverage types, claim steps).
- UI/UX wireframes using **Figma**.
- Risk assessment focusing on **data privacy and compliance with Sri Lanka's PDPA (2022)**.

Phase 1 – MVP Development (Month 3–6)

- **My Coverage Plan (MCP)** module: Manual policy entry, attachments, and secure storage in SQLite.
- **Coverage Coach (basic)**: Push reminders for renewals and premiums.
- **Neo4j Integration (v1)**: Simple ontology queries for generic claim steps and coverage clarifications.
- Implementation of **local-only storage** for full privacy.

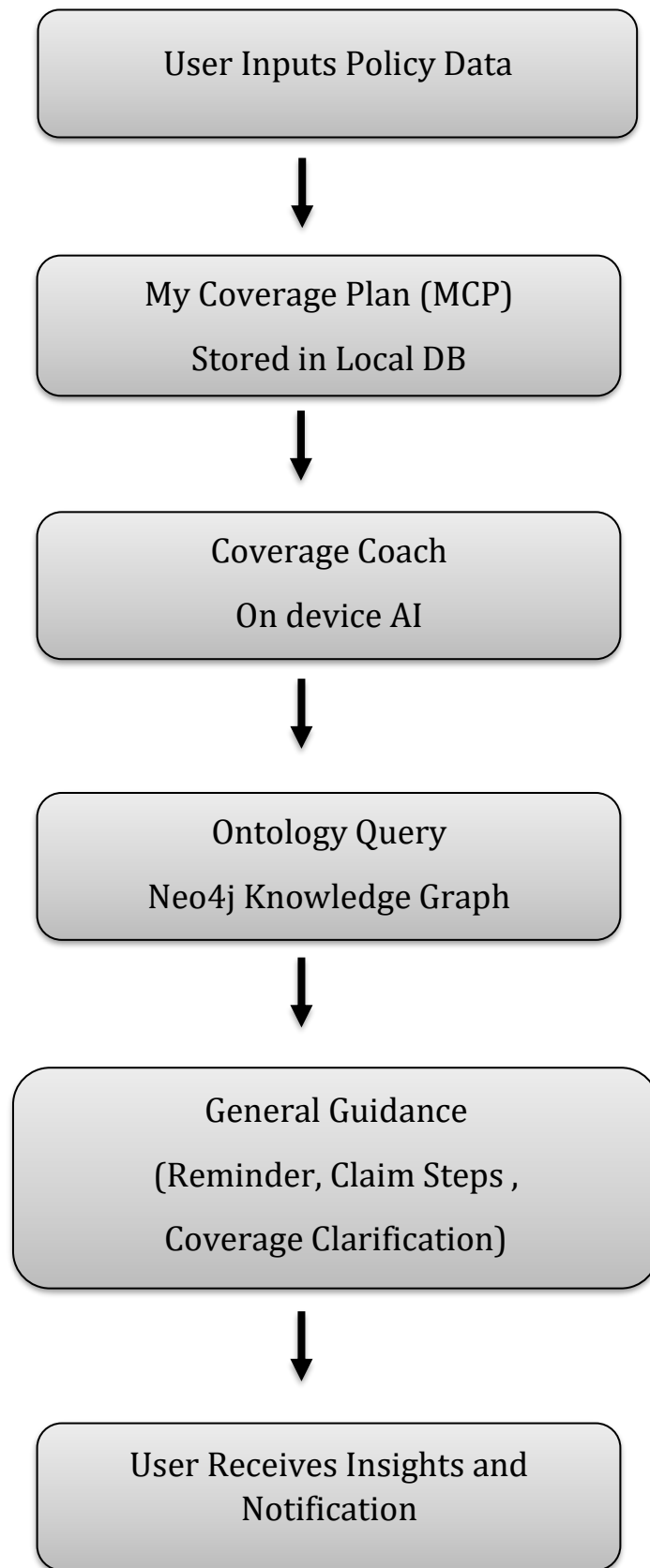
Phase 2 – Enhancements (Month 7–9)

- **OCR Integration** (policy scanning → auto-fill MCP fields).
- **Family/Group Accounts** to manage multiple policies.
- Advanced **reminder system** (premium escalation alerts, “expiring soon” flags).
- UI/UX redesign based on initial user feedback.

Phase 3 – Testing & Finalization (Month 10–12)

- **Comprehensive Testing**:
 - Unit, integration, usability, and security testing.
 - Performance testing for local DB queries and Neo4j requests.
- **Analytics Dashboard**: Coverage gaps, overlapping policies, and summary reports.
- **Export Features**: PDF/CSV reports for MCP.
- Preparation of **Privacy Policy and Disclaimer**.
- Deployment to **Google Play Store** and final **project viva**.

10. Proposed approaches



11.Resource Requirements

Software:

- React Native (Expo Go)
- SQLite (secure local DB)
- Neo4j (cloud instance for ontology)
- Java spring boot
- Langchain

Hardware:

- Development laptop
- Android/iOS testing devices
- Cloud hosting (AWS/GCP free tier)

Human Resources:

- Mobile developer (solo)
- Database administrator

10. Time Schedule

Task Name		2025/2026						
		Aug	Sep	Oct	Nov	Dec	Jan	Feb
1.	Proposal writing online workshop							
2.	Project proposal submission							
3.	Project proposal evaluation							
4.	Notify the selection							
5.	Requirement gathering. Literature Survey Progress Report Submission.							
6.	Chapter 1 – Introduction background of the problem draft report submission							
7.	Draft report of chapter 2 - Literature Review - Progress Report Submission							
8.	Draft report of chapter 3 – Research Methodology Progress Report Submission							
9.	Data Collection Project Implementation							
10.	Draft Report of chapter 4 – (Data Analysis of Implementation and evaluation)							
11.	Draft report of chapter 5 - Conclusion and recommendation progress report submission							
12.	Final submission and Viva							

12.References

- **Insurance Regulatory Commission of Sri Lanka (IRCSL).** *Annual Report 2023.* Colombo: IRCSL.
<https://www.ircsrilanka.org>
- **World Bank (2023).** *Sri Lanka Digital Economy Report: Building a Stronger Digital Future.* Washington, DC: World Bank.
- **Parliament of Sri Lanka (2022).** *Personal Data Protection Act, No. 9 of 2022.*
<https://www.pdpa.gov.lk>
- **Neo4j Documentation (2025).** *Neo4j Graph Database Developer Guide.*
<https://neo4j.com/docs>
- **React Native Documentation (2025).** *React Native – Build Mobile Apps with JavaScript.*
<https://reactnative.dev/docs>
- **SQLite Documentation (2025).** *SQLite Database Engine.*
<https://www.sqlite.org/docs.html>
- **Tesseract OCR (2025).** *Tesseract Open Source OCR Engine.*
<https://github.com/tesseract-ocr/tesseract>
- **PwC (2023).** *Future of Insurance: Digital Trends in Emerging Markets.* PricewaterhouseCoopers Report.
- **Deloitte (2022).** *AI in Insurance: From Automation to Augmentation.* Deloitte Insights