Project Proposal Report

Project Title

AI-Powered Healthcare Chatbot with Integration of SNOMED, LOINC, ICD-10, and Sarvam AI

---

1. Executive Summary

This project aims to develop an AI-driven chatbot for healthcare applications that leverages **Sarvam AI** alongside SNOMED CT, LOINC, and ICD-10 standards. Sarvam AI's multilingual and voice-enabled capabilities will enhance accessibility and usability, enabling the chatbot to assist patients with symptom triage, lab result interpretation, and disease classification. The solution will ensure clinical accuracy, interoperability, and compliance with healthcare regulations.

---

2. Objectives

- **Primary Objective**: Develop a healthcare chatbot integrating Sarvam AI's models with SNOMED CT, LOINC, and ICD-10 for accurate symptom analysis, lab test interpretation, and disease classification.
- **Secondary Objectives**:
    - Utilize Sarvam AI's multilingual and voice-enabled tools for enhanced user interaction.
    - Ensure the chatbot is compliant with healthcare data privacy regulations (HIPAA/GDPR).
    - Provide a scalable solution for healthcare providers and patients.

---

3. Background and Motivation

The need for AI-driven chatbots in healthcare is growing, especially in regions with diverse linguistic requirements. **Sarvam AI**, with its Indic language support and foundational AI models, is ideal for building multilingual, voice-enabled chatbots that cater to India's diverse population. Integrating SNOMED, LOINC, and ICD-10 ensures global applicability and clinical accuracy.

---

4. Scope of the Project

1. **Core Features**:
    - **Symptom Triage**: Map patient-reported symptoms to SNOMED codes for potential diagnoses.
    - **Lab Test Interpretation**: Use LOINC codes to interpret and explain lab results.
    - **Disease Classification**: Assign ICD-10 codes for documented diseases or conditions.
2. **Advanced Features**:
    - Leverage Sarvam AI for voice-enabled and multilingual support, covering 10 Indic languages and English.
    - Integrate Sarvam Agents for deployment on WhatsApp, mobile apps, and websites.
3. **User Groups**:
    - Patients seeking health advice in multiple languages.
    - Healthcare providers looking for tools to automate routine tasks.

---

5. Methodology

Phase 1: Requirements Analysis

- Collaborate with healthcare professionals to define chatbot features.
- Analyze Sarvam AI's tools (Sarvam Agents, Sarvam 2B, Shuka 1.0) for integration.

Phase 2: Data Collection and Preprocessing

- Use Sarvam AI's pretrained Indic LLM for handling multilingual inputs.
- Integrate SNOMED, LOINC, and ICD-10 datasets for clinical mapping.

Phase 3: Model Development

- Use **Sarvam 2B** for natural language understanding and response generation.
- Leverage **Shuka 1.0** for speech-to-text (STT) and text-to-speech (TTS) functionalities.

- Build a knowledge base combining SNOMED, LOINC, and ICD-10 for backend processing.

Phase 4: Chatbot Development

- Develop intents and entities for chatbot interactions using Sarvam Agents.
- Integrate voice and multilingual capabilities to support diverse user groups.

Phase 5: Testing and Validation

- Validate responses with healthcare professionals.
- Test multilingual and voice functionalities across different platforms.

Phase 6: Deployment

- Deploy the chatbot on platforms like WhatsApp, mobile apps, and web interfaces via Sarvam Agents.
- Use Sarvam AI's built-in deployment tools for scaling and monitoring.

---

6. Tools and Technologies

- **Sarvam AI Platform**:
    - **Sarvam Agents**: For voice-enabled chatbot deployment.
    - **Sarvam 2B**: Indic LLM for multilingual and context-aware responses.
    - **Shuka 1.0**: Audio Language Model for STT and TTS.
- **Programming Languages**: Python
- **Databases**: MongoDB, Neo4j for SNOMED, LOINC, and ICD-10 codes
- **Frameworks**: Rasa, Dialogflow
- **APIs**: OpenAI GPT, Google Cloud Speech-to-Text, SNOMED CT API

---

7. Deliverables

- A fully functional chatbot with:
    - Symptom triage using SNOMED CT.
    - Lab result interpretation with LOINC.

    - Disease classification via ICD-10.
    - Voice-enabled and multilingual support using Sarvam AI.
- Deployment of the chatbot on WhatsApp, mobile apps, and web interfaces.
- Documentation covering design, integration, and user guides.

---

10. Expected Outcomes

- A scalable, multilingual chatbot providing accurate and user-friendly healthcare assistance.
- Streamlined integration of SNOMED, LOINC, and ICD-10 standards for clinical precision.
- Enhanced accessibility through Sarvam AI's voice and Indic language support.

---

11. Conclusion

This project combines Sarvam AI's cutting-edge tools with globally recognized medical terminologies to build a state-of-the-art healthcare chatbot. The solution will bridge gaps in patient engagement, clinical documentation, and accessibility, making healthcare more efficient and inclusive.