

# Problem Statement: AMAR SAHAYAK – Multi-User RAG-Based WhatsApp Integrated Citizen Support Chatbot (Bilingual: Odia & English)

## Background & Context:

In the pursuit of enhancing last-mile service delivery and citizen interface in district administration, there is a growing need for real-time, accessible, and context-aware digital tools that assist citizens in navigating government schemes, procedures, entitlements, and service queries.

"Amar Sahayak" is envisioned as a **conversational AI-based assistant**, accessible via **WhatsApp**, that will **democratize access to administrative information** for the people of Kalahandi and beyond. This tool should offer simple, accurate, and localized responses to citizen queries by leveraging recent advances in **Retrieval-Augmented Generation (RAG)** models and **Large Language Models (LLMs)**.

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## Problem Statement:

Design and prototype a **multi-user, bilingual (Odia + English), RAG-based chatbot – AMAR SAHAYAK** – that can be accessed by citizens via **WhatsApp** to receive real-time, context-specific information on government schemes, processes, rights, entitlements, and administrative procedures.

The solution should be capable of:

1. **Conversational Understanding:** Understand natural language queries (text) from users in both Odia and English.
2. **Knowledge Retrieval & Response Generation:**
  - Extract and organize knowledge from **structured and unstructured sources**: PDFs (laws, circulars, scheme guidelines), government websites, departmental rules, etc.
  - Use **RAG architecture** to retrieve relevant chunks and generate accurate, concise responses via a LLM (e.g., OpenAI GPT or similar).
3. **User Interface Integration:** Seamlessly integrate the chatbot with **WhatsApp**, supporting:
  - Multi-user sessions
  - Bilingual interaction
  - Follow-up questions / threaded context
4. **Tech Stack Considerations:**
  - Backend: Python with integration to OpenAI API (or similar)
  - RAG Pipeline: Document Chunking, Embedding (OpenAI/FAISS), Vector Store (e.g., Pinecone, Weaviate), Prompt Engineering
  - WhatsApp Integration: Twilio API / Meta Cloud API
  - Translation Support: Odia ↔ English using open-source or custom models
5. **System Requirements:**

- Lightweight, scalable design (can be deployed initially on local server/cloud)
  - Admin interface to update knowledge base regularly
  - Logging of user queries for continuous improvement
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### **Scope for Interns:**

You are invited to apply your technical, analytical, and creative skills to develop a **working prototype or design blueprint** of this solution. Your proposal should reflect:

- A clear **system design architecture**
- Knowledge base ingestion strategy (PDFs, Web scraping, etc.)
- Implementation of RAG workflow: chunking, embedding, retrieval, generation
- WhatsApp integration approach
- Handling of bilingual inputs & outputs (Odia and English)
- Potential UI flow (mockups, if possible)