

Generative AI-enhanced chatbot for customer support, first responders and public assistance in critical disaster early warning and emergency communication applications.

1	Problem Statement	Develop a Generative AI-enhanced chatbot for customer support, first responders and public assistance in critical disaster early warning and emergency communication applications
2	Technology Area	Artificial Intelligence
3	Project Introduction	<ul style="list-style-type: none"> • C-DOT, a premier telecom technology centre of Government of India, is committed towards developing cutting edge technologies and infrastructure in the field of disaster management, early warning and emergency communication • In an era marked by increasing frequency and severity of natural disasters, the need for timely and effective communication is paramount. However, the effectiveness of these systems is heavily dependent on their ability to assist users, ensuring quick resolution of queries and providing 24*7 support for troubleshooting issues. • To enhance the user experience and operational efficiency of disaster early warning platforms, the integration of generative AI technologies presents a promising solution. A generative AI-based customer support system can provide real-time assistance, answer queries, and deliver personalized information, thus improving user engagement and comprehension. This innovative approach aims to empower disaster managers by facilitating better access to critical information and offer crucial support during emergencies.
4	Problem Description	By leveraging advanced natural language processing capabilities, the proposed customer support system can automate responses, offer multilingual support, and utilize AI/ML techniques to assist disaster management authorities, first responders and common public in building disaster resilience. This tender document seeks proposals from qualified vendors to design, develop, and implement a generative AI-based customer support chatbot solution tailored specifically for use in disaster early warning and emergency communication systems, ultimately enhancing their effectiveness and reliability in safeguarding lives and property. The system should be able to handle the incoming traffic from both, the normal users and from the First Responders. It should also be able to discriminate this traffic

		<p>based upon the communication stacks defined by 3GPP standards and respond accordingly.</p> <ul style="list-style-type: none"> • Project Scope: <ul style="list-style-type: none"> ○ Develop a generative AI-based customer support system to enhance customer support activities and resolve queries for disaster managers ○ Provide real-time assistance and information tailored for first responders and general public related to ITU-CAP standards based disaster early warning platform. ○ The application should be capable of understanding the 3GPP based emergency communication. • Key Components: <ul style="list-style-type: none"> ○ Large Language Models (LLM) based pre-trained Generative AI model ○ Chatbot functionality with UI integration ○ Knowledge Base Creation and Updating Mechanism ○ Interactive Voice Response System (IVRS) Integration capabilities ○ Text to Speech & Speech to Text translation ○ Image Processing ○ Multiple Language Support ○ Decision Support System (DSS) ○ Email integration ○ Database Integration (both SQL & NoSQL) ○ Integration with Emergency services based on 3GPP standards ○ On-Premise deployment ○ Testing & Validation ○ Training & Documentation
5	Feature Sets and Capabilities	<ul style="list-style-type: none"> • Chatbot Features: <ul style="list-style-type: none"> ○ Natural Language Processing (NLP): Design and train a generative AI model capable of understanding and responding to user inquiries in natural language specifically in disaster management and emergency response domain. ○ Generative AI: Capabilities for generating contextually appropriate responses and carry text to text conversations.

		<ul style="list-style-type: none">○ Text to Speech (TTS): Should have text to speech and vice-versa translation and conversation capabilities.○ Multi-language Support: Should support conversations in multiple Indian languages along with English.○ Image Processing: Image Upload and Understanding capability.○ Multi-Platform Support: Integration across web and mobile apps○ User Authentication and Role based Access: Ability to authenticate users and provide role-based information access○ RAG based Fine Tuning: Enhance reliability of AI model and limit hallucinations using RAG based fine tuning● Generative AI Features:<ul style="list-style-type: none">○ Contextual Understanding: Tailoring responses based on current context.○ Continuous Learning: System improvements through machine learning from user interactions.● Knowledge Base Creation:<ul style="list-style-type: none">○ Develop a comprehensive knowledge base that includes FAQs, SOPs, and relevant information tailored for disaster early warning and emergency communication applications○ Establish mechanisms for the knowledge base to be updated in real-time as new information is provided.● Voice IVR:<ul style="list-style-type: none">○ Speech Recognition: Accurate processing of voice inputs.○ Natural Language Understanding (NLU): Comprehension of user intents for effective call handling.○ Emergency Call Routing: Prioritized routing for escalated user queries.● Decision Support System:<ul style="list-style-type: none">○ Data Integration: Seamless integration with existing databases and CRMs.○ Analytics and Reporting: Real-time analytics for operational insights.○ AI-Driven Recommendations: Recommendations based on data analysis for improved decision-making.● Email Integration:
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6	Role & Responsibilities of C-DOT	<p>C-DOT will provide technical development assistance, and financial support to the project partner(s) selected through a process of evaluation and due diligence conducted by a committee of subject experts.</p> <p>Wherever deemed necessary and depending upon the project type (i.e. co- development or fully outsourced), C-DOT may arrange resources, equipment, training, testing infrastructure, mandatory clearances, statutory permissions, and provide gap funding to the partner(s) in realizing the respective target deliverables.</p> <p>Development costs of the module, whether developed from scratch or derived from existing background technology of partner(s), shall be borne by C-DOT. C-DOT shall use the final solution for integration with production grade software. C-DOT reserves the right to modify and enhance the solution and provide it to C-DOT customers or another Partner(s).</p> <p>C-DOT shall engage with Partner(s) on a non-exclusive basis and shall retain its right to develop similar projects/products through other developmental programs.</p>
7	Role & Responsibilities of Partner	<p>The Partner(s) may build the required module afresh or by modifying pre-existing background technologies available with them. As per the project demand or project type, the Partner(s)</p>

		<p>may utilize the available test and infrastructure facilities offered by C-DOT with no/some financial implication for its usage.</p> <p>All commercial proposals shall include necessary cloud infrastructure cost as per requirements, manpower and cost breakup (Capital, Consumables, Travel, DA, Training, Contingency, Overhead, GST etc.). The proposal should include minimum of two years support for enhancements and capacity building for future enhancements in the product.</p> <p>Participation in the project shall be on a non-exclusive basis. All partner(s) shall be required to demonstrate commitment to the project by entering into a formal agreement with C-DOT as per the CCRP policy.</p>
8	Expected Deliverables	<p>Generative AI based Chatbot solution with feature set and capabilities enumerated in sl. No. 5</p> <p>Timeline : 6 Months (Including deployment, testing and training)</p>
9	Ownership of Background & Foreground IP	<p>All technologies created during the project shall be owned by the respective development partner(s), individually or collectively as the case may be. Any agreement required for collective ownership shall be settled directly by the concerned partners, but the ownership/IPR of the final solution shall rest with C-DOT only with all the deliverables including complete source code etc.</p>