

AI-POWEREDCHATBOTFORSMARTAGRICULTURE AND FARMER

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ABSTRACT

The AI-Powered Chatbot for SmartAgriculture is an innovative solution designed to assist farmers by providing real-time agricultural support through an intelligent virtual assistant. This system leverages cutting-edge Artificial Intelligence (AI) and Natural LanguageProcessing (NLP)to understand and respond to queries in multiple languages such as English, Tamil, and Hindi, enabling accessibility for farmers from diverse linguistic backgrounds. The chatbot is capable of offering personalized crop recommendations based on inputs like soil type, temperature, rainfall, season, region, and pH level. By integrating with the Gemini API, the chatbot generates accurate and context- aware responses tailored to the user's agricultural needs. Developed using React for the frontend and Node.js with Express for the backend, the system ensures a seamless and responsive user experience. PostgreSQL, along with Prisma ORM, is used to manage and store user and interaction data efficiently. Additionally, the chatbot includes voice support and speech recognition, allowing users to interact through spoken language, enhancing ease of use for those with limited literacy. The chatbot also offers multilingual speech output, real-time updates, and expert suggestions, effectively bridging the gap between traditional farming and digital agriculture.