RASA-BASED CHATBOT FOR ASSISTING FARMERS WITH GOVERNMENT SCHEMES

A MINI PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

Certified that this mini project report **"RASA-Based Chatbot for Assisting Farmers with Government Schemes"** is the bonafide work of **"Sudharsan S (221501149), Tamilarasan D (221501157)"** who carried out the project work under my supervision.

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INTERNAL EXAMINER   EXTERNAL EXAMINER

ACKNOWLEDGEMENT

ABSTRACT

Many farmers remain unaware of the government schemes available to support their agricultural and livelihood needs due to language barriers and limited access to clear, reliable information. This project proposes a **RASA-based bilingual conversational agent** designed to assist farmers by providing government scheme details in response to queries made in either **Tamil or English**. The system uses Natural Language Understanding (NLU) and dialogue management capabilities of the RASA framework to recognize scheme-related keywords, names, and user intents, and then deliver accurate, context-specific information. By supporting two languages and enabling interaction through simple text input, the chatbot improves accessibility and awareness of schemes across a diverse farmer population. This solution aims to bridge the communication gap between the government and rural communities, promoting better scheme utilization and informed decision-making among farmers.

Keywords: Conversational Agent, RASA, Government Schemes, Farmers, Bilingual Chatbot, Natural Language Processing (NLP), Scheme Awareness, Tamil and English Support, Agricultural Assistance, Dialogue System.

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CHAPTER - 1
INTRODUCTION

In India, agriculture plays a crucial role in the economy, with a large proportion of the population depending on farming for their livelihood. However, many farmers remain unaware of the government schemes and subsidies available to support their agricultural activities. This lack of awareness often hinders their access to vital resources that could enhance productivity and improve their economic condition. Despite the government's efforts to disseminate information through various channels, language barriers, and geographical constraints pose significant challenges.

To address these issues, this project aims to develop a **RASA-based conversational agent** that provides farmers with detailed, accessible, and real-time information about government schemes. The chatbot will support both **Tamil and English**, ensuring that farmers from diverse linguistic backgrounds can easily access the information. By interacting with the chatbot, users can inquire about specific schemes by name or related queries, and the system will provide relevant details based on the context of their questions. The primary goal is to empower farmers with the knowledge needed to make informed decisions, thereby improving their engagement with government schemes and supporting their agricultural endeavors.

The growing digital landscape in India presents an opportunity to leverage conversational AI for bridging the information gap between farmers and government services. Through the use of a **bilingual conversational agent**, farmers will be able to receive accurate and timely information on a range of government schemes related to subsidies, crop insurance, farming equipment, and more. This chatbot can significantly reduce the time and effort spent searching for information and enable farmers to make better decisions regarding the available support programs.

This system leverages the power of **Natural Language Understanding (NLU)** to interpret and respond to a wide range of queries, making the process efficient and user-friendly. The conversational agent is designed to be scalable and can be integrated into mobile and web platforms, ensuring that farmers in rural areas with limited internet access can benefit from this solution. Additionally, the chatbot's ability to process natural language queries in both **Tamil and English** enhances its usability and makes it more inclusive for farmers from different regions of Tamil Nadu.

Furthermore, this project contributes to the broader vision of **Digital India** by promoting digital literacy and encouraging the use of technology in agriculture. By providing an intuitive and reliable interface, the chatbot acts as a virtual assistant that can guide farmers through complex bureaucratic processes, offer reminders for application deadlines, and connect them to relevant local authorities when necessary.

In conclusion, the proposed RASA-based bilingual chatbot has the potential to **transform the way farmers access government services**, bridging the gap between policy and practice. By empowering farmers with the right information at the right time, the system fosters sustainable agricultural development, reduces dependency on middlemen, and enhances the socio-economic well-being of rural communities.

CHAPTER - 2

LITERATURE REVIEW

[1] Title: Farmer-Bot: An Interactive Bot for Farmers

Authors: N. Darapaneni, R. Tiwari, A. R. Paduri, S. Saurav, R. Chaoji, and S. Sodhiya

This paper explores the development of an interactive bot (Farmer-Bot) for farmers that provides real-time answers to various agriculture-related questions. The chatbot, based on the RASA framework, enables farmers to query about crop-related issues, pest control methods, and government schemes. The system is designed to be bilingual, supporting both Tamil and English to cater to farmers from different linguistic regions. The paper discusses the architecture, challenges in training models for rural dialects, and the integration of government schemes information into the bot.

[2] Title: LSTM-RASA Based Agri Farm Assistant for Farmers

Authors: K. R. Karthikeyan, S. R. Venkatesh, and S. V. Kumar

This paper presents an agriculture-focused chatbot that combines Long Short-Term Memory (LSTM) networks with the RASA framework to provide a conversational assistant for farmers. It helps users receive recommendations on crop management, fertilizers, weather, and irrigation. The model captures the sequential flow of conversations, enabling context-aware answers. The research highlights the advantages of using LSTM for enhancing the contextual memory of the bot and improving user satisfaction.

[3] Title: Agri Friendly Conversational AI Chatbot Using Open Source Framework

Authors: J. P. Gujjar and H. R. P. Kumar

This paper introduces a user-friendly agricultural chatbot developed using open-source frameworks such as RASA and Python-based NLP libraries. The chatbot aims to assist farmers by providing easy access to information on crop selection, market prices, and agricultural best practices. The study emphasizes cost-effectiveness, accessibility, and ease of customization for rural deployment. Field testing was conducted to evaluate its usability among farmers with limited digital literacy.

[4] Title: Empowering Tamil-Speaking Farmers: A Tanglish-Supported Audio-Based Agriculture Chatbot for Real-Time Query Responses

Authors: A. Kumar G., B. Balasaigayathri, and C. M.

This paper presents an audio-based chatbot that enables Tamil-speaking farmers to ask queries using Tanglish (Tamil mixed with English) voice input. The system uses speech-to-text conversion and text-based NLP models to provide real-time answers related to farming, government schemes, and weather. It bridges the communication gap for semi-literate users and focuses on inclusivity and real-time support using mobile interfaces.

[5] Title: AgriBot: A Tamil Chatbot for Farmers Using Transformer

Authors: K. R. Karthikeyan, S. R. Venkatesh, and S. V. Kumar

The authors propose a chatbot, AgriBot, based on Transformer models to serve Tamil-speaking farmers. The bot leverages deep learning for better natural language understanding and provides information related to crop insurance, pest control, and government subsidies. The chatbot demonstrates improved language comprehension compared to traditional rule-based models and supports both offline and online deployment modes.

[6] Title: Voice-Bot for Smart Agriculture

Authors: P. Kaviya, S. S. R. Kumar, and M. R. Kumar

This paper discusses the implementation of a voice-based assistant designed to help farmers manage agricultural activities through voice commands. The bot supports Tamil and English inputs, providing responses related to crop maintenance, irrigation, pest control, and seasonal planning. It is optimized for smartphones with low processing power, making it suitable for deployment in rural India.

[7] Title: AgriBot: A Multilingual AI Agent for Farmers Using LangChain

Authors: S. Sharma and R. Gupta

This paper presents AgriBot, a multilingual conversational AI agent using LangChain and LLMs. It supports Indian languages and provides intelligent, real-time responses to farmers' questions regarding agriculture practices, weather, and government programs. The system uses retrieval-augmented generation (RAG) and integrates knowledge bases for high accuracy.

[8] Title: AgriBot - Using Rasa Framework

Authors: S. Patel, A. Mehta, and R. Shah

This study describes AgriBot, a chatbot developed using the RASA framework to provide agricultural assistance. The bot helps farmers with information on crop diseases, fertilizer recommendations, and market prices. It supports contextual conversations and integrates with platforms like WhatsApp for wider outreach. The authors detail the dialogue management system and user interaction flow.

[9] Title: Empowering Farmers with Chatbot Technology

Authors: A. K. Singh and M. Verma

The paper examines the potential of chatbot technology to revolutionize agricultural communication. It discusses chatbot features that offer answers to questions about government benefits, soil health, and water conservation. The study emphasizes the importance of user-centric design and localization to ensure adoption in rural communities.

[10] Title: AgriLLM: Harnessing Transformers for Farmer Queries

Authors: K. R. Karthikeyan, S. R. Venkatesh, and S. V. Kumar

This paper introduces AgriLLM, a chatbot built using transformer-based models tailored for agricultural domains. It addresses farmer queries using deep contextual embeddings and supports Tamil and English. AgriLLM is trained on domain-specific datasets to enhance its relevance and accuracy. The study evaluates the performance of the chatbot against traditional models and showcases its real-time application in field scenarios.

CHAPTER 3

SYSTEM OVERVIEW

3.1 EXISTING SYSTEM

The existing system for providing agricultural information to farmers relies mainly on manual methods, such as government helplines, printed materials, and in-person consultations. While helplines and call centers offer support, they are limited to working hours and often experience delays. Printed materials like pamphlets and posters have limited reach and can be outdated. In-person visits to government offices or agricultural advisors are time-consuming and costly, especially for farmers in remote areas. Some government websites and apps exist, but they are often complex and lack multilingual support, making them difficult for farmers with low technical literacy to use. These limitations highlight the need for a more efficient, accessible, and real-time solution, which can be addressed by a RASA-based conversational agent providing personalized assistance in multiple languages.

3.2 PROPOSED SYSTEM

The proposed system is a web-based RASA-based conversational agent designed to assist farmers with information about government schemes. This chatbot will be accessible through a web interface and provide real-time, personalized responses to farmer queries regarding various schemes, eligibility, application processes, and benefits. The system will utilize Natural Language Processing (NLP) to understand user inputs in both Tamil and English, offering multilingual support to ensure accessibility for a wider audience.

The chatbot will be integrated with a comprehensive knowledge base of government schemes, agricultural practices, and other relevant information, allowing farmers to quickly obtain accurate and up-to-date details at any time. By being available on the web, the system ensures that farmers, especially those in remote areas, can access it 24/7, overcoming the time constraints of traditional support systems such as helplines or in-person visits. This web-based approach not only provides immediate assistance but also reduces the need for physical travel and lengthy consultations, making it a cost-effective and efficient solution for farmers seeking information on government schemes.

CHAPTER 4

SYSTEM REQUIREMENTS

4.1 HARDWARE REQUIREMENTS:

- **Processor**: Intel i5 or better.
- **RAM**: 8 GB.
- **Graphics Card**: NVIDIA GTX 1050 for smoother operation.
- **Storage**: 256 GB SSD or 512 GB SSD.
- **Operating System**: Windows 10 or higher.
- **Network**: Stable internet connection (10 Mbps+).

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4.2 SOFTWARE REQUIREMENTS:

- **Operating System:** Windows 10 or higher, Linux (Ubuntu recommended).
- **RASA:** RASA Open Source (latest version).
- **Python**: Python 3.7 or higher.
- **Web Browser**: Google Chrome, Mozilla Firefox, or Microsoft Edge.
- **IDE/Text Editor**: Visual Studio Code, PyCharm.
- **Libraries**: NLTK, spaCy, TensorFlow or PyTorch.

CHAPTER 5

SYSTEM DESIGN

5.1 SYSTEM ARCHITECTURE
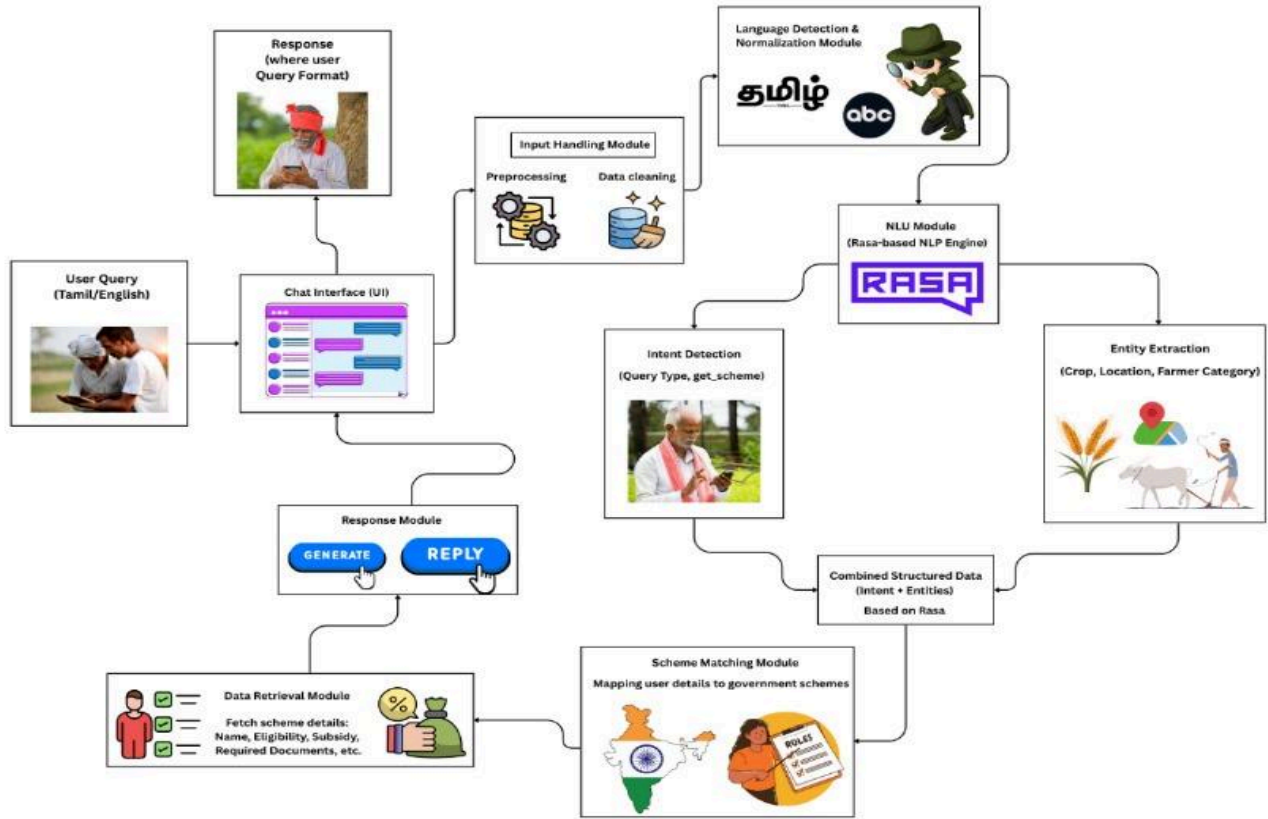
FIGURE 5.1: SYSTEM ARCHITECTURE

Figure 5.1 illustrates the system architecture of the proposed web-based RASA chatbot developed to assist farmers in accessing information about government schemes using queries in either Tamil or English. When a user inputs a query through the chatbot interface, the system first preprocesses the input and determines the language using a language detection module. The preprocessed query is then passed to the RASA NLU engine, which identifies the user's intent and extracts relevant entities. Based on this information, the system queries a backend database to retrieve the most appropriate details about government schemes, including eligibility criteria and benefits. A clear and concise response is then generated and delivered back to the user via the chatbot interface, ensuring an accessible and user-friendly experience.

5.2 Workflow of the Model

- The user submits a query in either Tamil or English through the chatbot interface on the web application.
- The **Input Handling Module** cleans and preprocesses the raw text to remove noise and ensure consistency.
- The **Language Detection Module** identifies the language of the input and normalizes the text into a standard format.
- The preprocessed query is passed to the **RASA NLU Module**, which detects the user's intent and extracts relevant entities.
- The detected intent and extracted entities are structured into a backend-compatible format.
- The **Scheme Matching Module** uses the structured data to map the query to the most relevant government schemes.
- The **Data Retrieval Module** fetches detailed information about the matched scheme, including eligibility criteria, benefits, and required documentation.
- The **Response Module** generates a clear and user-friendly reply using the retrieved information and sends it back through the chatbot interface.

CHAPTER 6
CONCLUSION AND FUTURE ENHANCEMENT

6.1 CONCLUSION

The developed RASA-based conversational agent significantly enhances the accessibility and usability of government scheme information for farmers by offering instant, accurate, and language-adaptive responses in both Tamil and English. By leveraging advanced Natural Language Understanding (NLU), the system accurately interprets user queries and provides relevant scheme details in a simple, **conversational format**, making it highly user-friendly for individuals with limited digital literacy. This intelligent chatbot eliminates the need for manual searching or navigating complex government websites, thereby saving time and reducing confusion for farmers. Moreover, the system plays a crucial role in bridging the information and communication gap between rural communities and government services. Through its intuitive web interface and multilingual support, it empowers farmers to make informed decisions about the schemes they are eligible for, such as subsidies, loans, or support programs. By improving awareness, accessibility, and engagement, this chatbot serves as a valuable tool in promoting digital inclusion and supporting agricultural development.

6.2 FUTURE ENHANCEMENT

The chatbot can be enhanced by integrating a voice assistant feature, allowing farmers to interact through voice commands. This will help those with low literacy levels and make the system more accessible, especially when working in the field. The voice assistant will offer a hands-free experience, improving usability for farmers on the go.

In addition, the chatbot can provide real-time weather forecasts and alerts for extreme weather, helping farmers plan their activities. Personalized soil and fertility management advice, pest and disease detection using AI-powered image recognition, and market price updates can be included to assist with crop management. For animal husbandry, features like livestock health tracking and feeding schedules can be added. Finally, real-time notifications on government schemes and eligibility checks will ensure farmers are aware of available support and resources. These features will provide a comprehensive solution to aid farmers in both crop and livestock management.

CHAPTER 7

APPENDIX

A1.1 SAMPLE CODE

CODING
nlu.yml

```yaml
version: "3.1"
nlu:
- intent: greet
  examples: |
    - hello
    - hi
    - hey
    - good morning
    - good evening
    - வணக்கம்
    - ஹாய்
    - வாழ்த்துக்கள்
    - காலை வணக்கம்
    - மாலை வணக்கம்

- intent: goodbye
  examples: |
    - goodbye
    - bye
    - see you later
    - take care
    - thanks and bye
    - நன்றி
    - விடைபெறுகிறேன்
    - பிறகு பார்க்கலாம்
    - பை
    - கவனமாக இரு
```

- intent: inform
  examples: |
    - I prefer Tamil language
    - I prefer English language
    - I want to speak in English
    - Please use English
    - Switch to English
    - I prefer Tamil
    - My district is [Thanjavur](district)
    - I am a [small farmer](farmer_type)
    - Tell me about [PM-KISAN](scheme_name) eligibility
    - What is the subsidy for [solar pumps](scheme_name)?
    - [தமிழ்](language) விரும்புகிறேன்
    - [ஆங்கிலம்](language) விரும்புகிறேன்
    - ஆங்கிலத்தில் பேச விரும்புகிறேன்
    - தயவுசெய்து ஆங்கிலம் பயன்படுத்தவும்
    - ஆங்கிலத்திற்கு மாறவும்
    - என் மாவட்டம் [தஞ்சாவூர்](district)
    - நான் ஒரு [சிறு விவசாயி](farmer_type)
    - [PM-KISAN](scheme_name) தகுதி பற்றி சொல்லுங்கள்
    - [சூரிய பம்புகள்](scheme_name) மானியம் என்ன?

- intent: ask_agri_mechanization
  examples: |
    - How to get tractor subsidy?
    - Tell me about agricultural mechanization
    - Subsidy for farm equipment
    - How can I get a tractor rental?
    - Mechanization scheme details
    - டிராக்டர் மானியம் எப்படி பெறுவது?
    - வேளாண்மை இயந்திரமயமாக்கல் பற்றி சொல்லுங்கள்
    - பண்ணை உபகரணங்களுக்கான மானியம்
    - டிராக்டர் வாடகை எப்படி பெறுவது?
    - இயந்திரமயமாக்கல் திட்ட விவரங்கள்

- intent: ask_solar_pumps
  examples: |
    - Solar pump subsidy details
    - How to apply for solar pumps?
    - Tell me about solar powered pumpsets
    - Eligibility for solar pump scheme
    - Solar pumps in [Thanjavur](district)

    - சூரிய பம்பு மானிய விவரங்கள்
    - சூரிய பம்புகளுக்கு எப்படி விண்ணப்பிப்பது?
    - சூரிய சக்தி பம்புசெட்டுகள் பற்றி சொல்லுங்கள்
    - சூரிய பம்பு திட்டத்திற்கு தகுதி
    - [தஞ்சாவூரில்](district) சூரிய பம்புகள்

- intent: ask_value_addition
  examples: |
    - Value addition machinery subsidy
    - Tell me about post-harvest schemes
    - How to get storage equipment?
    - Subsidy for value addition
    - Value addition in [Madurai](district)
    - மதிப்பு கூட்டும் இயந்திர மானியம்
    - அறுவடைக்கு பின் திட்டங்கள் பற்றி சொல்லுங்கள்
    - சேமிப்பு உபகரணங்களை எப்படி பெறுவது?
    - மதிப்பு கூட்டுதலுக்கான மானியம்
    - [மதுரையில்](district) மதிப்பு கூட்டுதல்

- intent: ask_integrated_development
  examples: |
    - Kalaignar village development scheme
    - Tell me about integrated farming
    - Subsidy for water resources
    - Integrated development in [Cauvery Delta](district)
    - Village farming schemes
    - கலைஞர் கிராம வளர்ச்சி திட்டம்

- ஒருங்கிணைந்த விவசாயம் பற்றி சொல்லுங்கள்
- நீர் ஆதாரங்களுக்கான மானியம்
- [காவிரி டெல்டாவில்](district) ஒருங்கிணைந்த வளர்ச்சி
- கிராம விவசாய திட்டங்கள்

- intent: ask_solar_dryers
  examples: |
    - Solar dryer subsidy
    - How to get solar tunnel dryers?
    - Tell me about drying schemes
    - Solar dryers for farmers
    - Solar dryer in [Salem](district)
    - சூரிய உலர்த்தி மானியம்
    - சூரிய கூடார உலர்த்திகளை எப்படி பெறுவது?
    - உலர்த்தும் திட்டங்கள் பற்றி சொல்லுங்கள்
    - விவசாயிகளுக்கான சூரிய உலர்த்திகள்
    - [சேலத்தில்](district) சூரிய உலர்த்தி

- intent: ask_electric_pumps
  examples: |
    - Electric pump subsidy
    - How to apply for electric motor pumps?
    - Tell me about subsidized pumps
    - Electric pumps for [small farmers](farmer_type)
    - Electric pumps in [Erode](district)
    - மின்மோட்டார் பம்பு மானியம்
    - மின்மோட்டார் பம்புகளுக்கு எப்படி விண்ணப்பிப்பது?
    - மானியத்தில் பம்புகள் பற்றி சொல்லுங்கள்
    - [சிறு விவசாயிகளுக்கு](farmer_type) மின்மோட்டார் பம்புகள்
    - [ஈரோட்டில்](district) மின்மோட்டார் பம்புகள்

- intent: ask_micro_irrigation
  examples: |
    - Micro irrigation subsidy
    - Tell me about drip irrigation
    - How to get water efficiency schemes?
    - Micro irrigation in [Coimbatore](district)

- Subsidy for [small farmers](farmer_type)
      - நுண்ணீர் பாசன மானியம்
      - நீர்த்துளி பாசனம் பற்றி சொல்லுங்கள்
      - நீர் திறன் திட்டங்களை எப்படி பெறுவது?
      - [கோயம்புத்தூரில்](district) நுண்ணீர் பாசனம்
      - [சிறு விவசாயிகளுக்கு](farmer_type) மானியம்
- intent: ask_auto_pump_control
  examples: |
      - Automatic pump control subsidy
      - Tell me about mobile-operated pumps
      - How to get pump control systems?
      - Auto pump in [Tiruppur](district)
      - Subsidy for pump automation
      - தானியங்கி பம்பு கட்டுப்பாடு மானியம்
      - கைபேசி இயக்க பம்புகள் பற்றி சொல்லுங்கள்
      - பம்பு கட்டுப்பாடு அமைப்புகளை எப்படி பெறுவது?
      - [திருப்பூரில்](district) தானியங்கி பம்பு
      - பம்பு தானியங்குதலுக்கான மானியம்

- intent: ask_sugarcane_machinery
  examples: |
      - Sugarcane machinery subsidy
      - Tell me about sugarcane rental centers
      - How to get sugarcane equipment?
      - Sugarcane schemes in [Villupuram](district)
      - Subsidy for sugarcane farmers
      - கரும்பு இயந்திர மானியம்
      - கரும்பு வாடகை மையங்கள் பற்றி சொல்லுங்கள்
      - கரும்பு உபகரணங்களை எப்படி பெறுவது?
      - [விழுப்புரத்தில்](district) கரும்பு திட்டங்கள்
      - கரும்பு விவசாயிகளுக்கு மானியம்
- intent: ask_water_modernization
  examples: |
      - Water modernization subsidy
      - Tell me about farm ponds
      - How to apply for water schemes?
      - Water modernization in [Lower Vaigai](district)
      - Subsidy for water efficiency

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- நீர்வள நவீனமயமாக்கல் மானியம்
- பண்ணைக் குட்டைகள் பற்றி சொல்லுங்கள்
- நீர் திட்டங்களுக்கு எப்படி விண்ணப்பிப்பது?
- [கீழ் வைகையில்](district) நீர்வள நவீனமயமாக்கல்
- நீர் திறனுக்கான மானியம்
- intent: ask_land_development
  examples: |
    - Land development subsidy
    - How to get bulldozer rental?
    - Tell me about land shaping
    - Land development in [Dindigul](district)
    - Subsidy for land leveling
    - நில மேம்பாட்டு மானியம்

    - புல்டோசர் வாடகையை எப்படி பெறுவது?
    - நில வடிவமைப்பு பற்றி சொல்லுங்கள்
    - [திண்டுக்கல்லில்](district) நில மேம்பாடு
    - நில சமன்படுத்துதலுக்கான மானியம்

- intent: ask_solar_fencing
  examples: |
    - Solar fencing subsidy
    - How to apply for solar fences?
    - Tell me about crop protection schemes
    - Solar fencing in [Krishnagiri](district)
    - Subsidy for animal protection
    - சூரிய வேலி மானியம்
    - சூரிய வேலிகளுக்கு எப்படி விண்ணப்பிப்பது?
    - பயிர் பாதுகா�ப்பு திட்டங்கள் பற்றி சொல்லுங்கள்
    - [கிருஷ்ணகிரியில்](district) சூரிய வேலி
    - விலங்கு பாதுகாப்புக்கான மானியம்
- intent: ask_pm_kisan
  examples: |
    - PM-KISAN scheme details
    - How to apply for PM-KISAN?
    - Tell me about farmer income support
    - PM-KISAN eligibility

- PM-KISAN in [Tirunelveli](district)
- PM-KISAN திட்ட விவரங்கள்
- PM-KISAN-க்கு எப்படி விண்ணப்பிப்பது?
- விவசாயி வருமான ஆதரவு பற்றி சொல்லுங்கள்
- PM-KISAN தகுதி
- [திருநெல்வேலியில்](district) PM-KISAN

Rules.yml
```yaml
- rule: Respond to greet
  steps:
  - intent: greet
  - action: action_respond
- rule: Respond to goodbye
  steps:
  - intent: goodbye
  - action: action_respond

- rule: Respond to inform
  steps:
  - intent: inform
  - action: action_set_language
  - action: action_respond
- rule: Respond to ask_agri_mechanization
  steps:
  - intent: ask_agri_mechanization
  - action: action_respond
- rule: Respond to ask_solar_pumps
  steps:
  - intent: ask_solar_pumps
  - action: action_respond
- rule: Respond to ask_value_addition
  steps:
  - intent: ask_value_addition
  - action: action_respond

- rule: Respond to ask_integrated_development
  steps:
  - intent: ask_integrated_development
  - action: action_respond
```

```
- rule: Respond to ask_solar_dryers
  steps:
  - intent: ask_solar_dryers
  - action: action_respond

- rule: Respond to ask_electric_pumps
  steps:
  - intent: ask_electric_pumps
  - action: action_respond

- rule: Respond to ask_micro_irrigation
  steps:
  - intent: ask_micro_irrigation
  - action: action_respond

- rule: Respond to ask_auto_pump_control
  steps:
  - intent: ask_auto_pump_control
  - action: action_respond

- rule: Respond to ask_sugarcane_machinery
  steps:
  - intent: ask_sugarcane_machinery
  - action: action_respond

- rule: Respond to ask_water_modernization
  steps:
  - intent: ask_water_modernization
  - action: action_respond
- rule: Respond to ask_land_development
  steps:
  - intent: ask_land_development
  - action: action_respond
- rule: Respond to ask_solar_fencing
  steps:
  - intent: ask_solar_fencing
  - action: action_respond
- rule: Respond to ask_pm_kisan
  steps:
  - intent: ask_pm_kisan
```

```yaml
      - action: action_respond
```

stories.yml

```yaml
version: "3.1"
stories:
- story: Greet and ask scheme in English
  steps:
  - intent: greet
  - action: action_respond
  - intent: ask_agri_mechanization
  - action: action_respond
- story: Greet and ask scheme in Tamil
  steps:
  - intent: greet
  - action: action_respond

  - intent: inform
    entities:
    - name: language
      value: tamil
  - action: action_set_language
  - action: action_respond
  - intent: ask_solar_pumps
  - action: action_respond

- story: Goodbye
  steps:
  - intent: goodbye
  - action: action_respond
- story: Ask for details
  steps:
  - intent: inform
  - action: action_respond
  - intent: ask_pm_kisan
  - action: action_respond
- story: Ask integrated development
  steps:
  - intent: ask_integrated_development
  - action: action_respond
- story: Ask solar dryers
  steps:
```

```
    - intent: ask_solar_dryers
    - action: action_respond
- story: Ask electric pumps
  steps:
    - intent: ask_electric_pumps
    - action: action_respond
- story: Ask micro irrigation
  steps:
    - intent: ask_micro_irrigation
    - action: action_respond
- story: Ask auto pump control
  steps:
    - intent: ask_auto_pump_control
    - action: action_respond

- story: Ask sugarcane machinery
  steps:
    - intent: ask_sugarcane_machinery
    - action: action_respond
- story: Ask water modernization
  steps:
    - intent: ask_water_modernization
    - action: action_respond
- story: Ask land development
  steps:
    - intent: ask_land_development
    - action: action_respond
- story: Ask solar fencing
  steps:
    - intent: ask_solar_fencing
    - action: action_respond

- story: Ask value addition
  steps:
    - intent: ask_value_addition
    - action: action_respond
```

A1.2 SCREENSHOTS
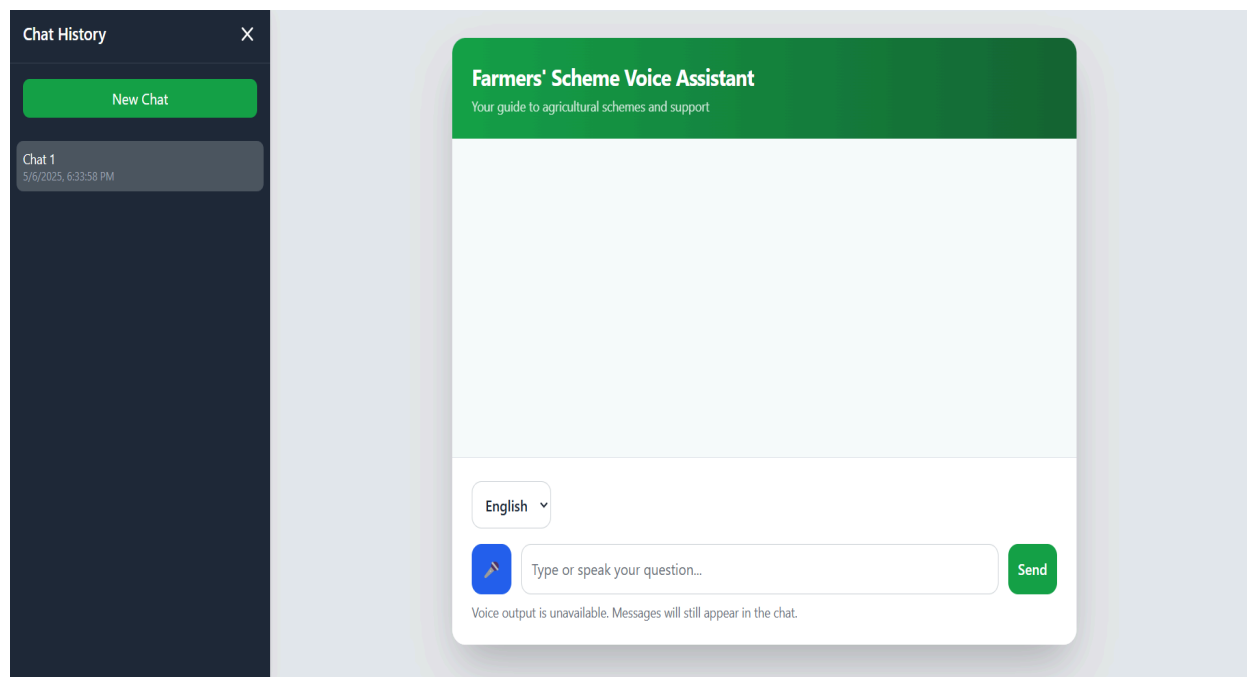
FIGURE A1.2.1: WEBPAGE (which gets the user inputs queries)

விவசாயி வருமான ஆதரவு பற்றி சொல்லுங்கள்

PM-KISAN திட்டம் சிறு/குறு விவசாயிகளுக்கு ஆண்டுக்கு ₹6,000 மூன்று தவணைகளாக வழங்குகிறது. தேவை: நில உரிமை, ஆதார், வங்கி பாஸ்புக், குடும்ப அட்டை, தொலைபேசி எண். பொது சேவை மையங்களில் பதிவு செய்யவும். தொடங்கப்பட்டது: பிப்ரவரி 2019. தொடர்பு: உள்ளூர் வேளாண்மை அலுவலகம்.

English ⌄

🎙️ | Type or speak your question... | **Send**

Voice output is unavailable. Messages will still appear in the chat.

FIGURE A1.2.2: QUERY INPUT

Farmers' Scheme Assistant
Your guide to agricultural schemes and support

மின்மோட்டார் பம்புகளுக்கு எப்படி விண்ணப்பிப்பது?

மானியத்தில் மின்மோட்டார் பம்புசெட்டுகள் திட்டம் மின்சார பயன்பாட்டு திறனை மேம்படுத்தி பாசன செலவைக் குறைக்கிறது. மானியம்: ₹15,000 அல்லது 50% (எது குறைவோ). சென்னை தவிர அனைத்து மாவட்டங்களிலும் உள்ளது. தகுதி: 5 ஏக்கர் வரை நிலமுள்ள விவசாயிகள், நுண்ணீர்ப்பாசனம் உள்ளவர்கள் அல்லது அதை திட்டமிடுபவர்கள். தொடர்பு: உதவி செயற் பொறியாளர், வேளாண்மைப் பொறியியல் துறை.
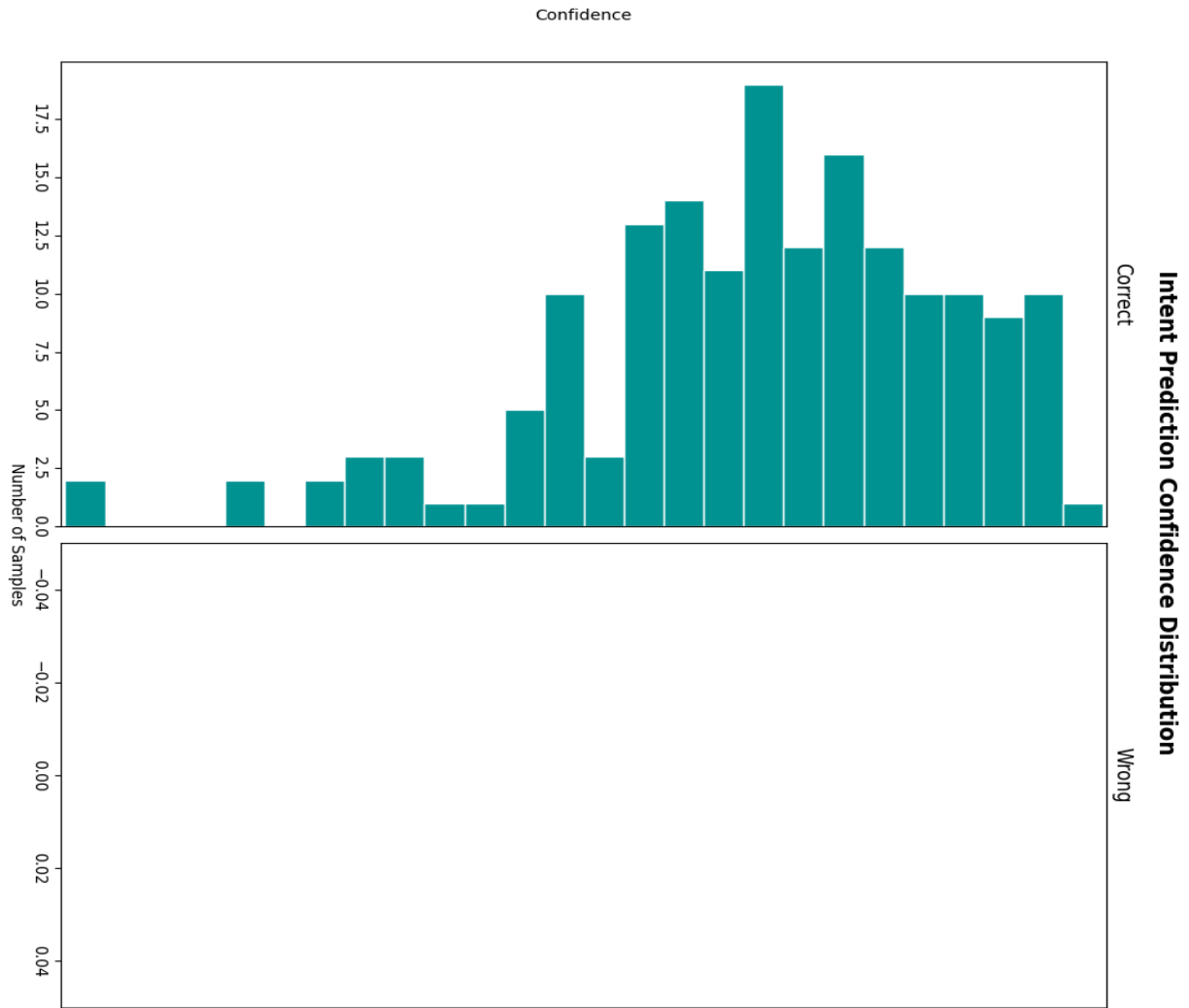
English ⌄

[🎤] Type or speak your question...   **Send**

Voice output is unavailable. Messages will still appear in the chat.

FIGURE A1.2.3:ELECTRIC PUMP SUBSIDY

FIGURE A1.2.4:INTENT PREDICTION CONFIDENCE DISTRIBUTION

CHAPTER 8

REFERENCES

[1] N. Darapaneni, R. Tiwari, A. R. Paduri, S. Saurav, R. Chaoji, and S. Sodhiya, "Farmer-Bot: An Interactive Bot for Farmers," *ResearchGate*, 2022.

[2] K. R. Karthikeyan, S. R. Venkatesh, and S. V. Kumar, "LSTM-RASA Based Agri Farm Assistant for Farmers," *arXiv preprint arXiv:2204.09717*, 2022.

[3] J. P. Gujjar and H. R. P. Kumar, "Agri Friendly Conversational AI Chatbot Using Open Source Framework," *Indian Journal of Science and Technology*, vol. 18, no. 8, pp. 580–585, 2025.

[4] A. Kumar G., B. Balasaigayathri, and C. M., "Empowering Tamil-Speaking Farmers: A Tanglish-Supported Audio-Based Agriculture Chatbot for Real-Time Query Responses," *IOSR Journal of Computer Engineering*, vol. 27, no. 2, pp. 18–23, 2025.

[5] K. R. Karthikeyan, S. R. Venkatesh, and S. V. Kumar, "AgriBot: A Tamil Chatbot for Farmers Using Transformer," *International Journal of Research Publication and Reviews*, vol. 5, no. 5, pp. 1234–1240, 2024.

[6] P. Kaviya, S. S. R. Kumar, and M. R. Kumar, "Voice-Bot for Smart Agriculture," *Sathyabama Institute of Science and Technology*, 2023.

[7] S. Sharma and R. Gupta, "AgriBot: A Multilingual AI Agent for Farmers Using LangChain," *Analytics Vidhya*, 2025.

[8] S. Patel, A. Mehta, and R. Shah, "AgriBot - Using Rasa Framework," *River Publishers*, 2023.

[9] A. K. Singh and M. Verma, "Empowering Farmers with Chatbot Technology," *International Research Journal of Modernization in Engineering Technology and Science*, vol. 6, no. 1, pp. 45–50, 2024.

[10] K. R. Karthikeyan, S. R. Venkatesh, and S. V. Kumar, "AgriLLM: Harnessing Transformers for Farmer Queries," *arXiv preprint arXiv:2407.04721*, 2024.