

Farming Bot Assistance Using Google Dialogflow

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ABSTRACT

This is the generic concept of cloud based Farming assistance bot service. Cell phones progressed appropriation has encouraged the formation of different informing applications giving accommodation and common sense when all is said in done correspondence. In this sense, new innovations emerge bringing programmed, constant and shrewd highlights for correspondence through informing frameworks and from them utilizing web bots. Those are system developed bots that reenact genuine discussion from people's respond to their quires and do respond, providing the feeling that individual is conversing with another person and not with a system program. In rural areas it will be an important application for farmers of the Artificial Intelligence(AI) paradigm. By this service agronomist can be able to obtain the information of soil, weather, crop from their mobile. This will help the countryman to analyse the informations to grow the suitable crop in their yield. And to test the soil quality of their field. To increase the crop health we proposing the system called farming assistance bot using google dialogflow API.AI. By using the trunkable application android or apple users both can be able to access the farming assistance bot.

Keywords—Artificial Intelligence, Cloud, dialogflow Crop, Farming, Yield

1. INTRODUCTION

As most of the countryman do farming without predicting and analyzing weather the crop is best fit for their land to overcome this problem, we are coming up with the farming assistance bot to help the farmers.

According to the survey Countryman establish 54.6% of the Indian populace, however gains just around 14.9% of public GDP [1]. This growth confounds to be reduced by growing rancher's admittance to data and master counsel. In this project, we developed a bot which can fulfill farmer needs in form of soil and crop and weather called Farming Assistance Bot, to grow technical needs of ranchers in our country. The vast majority of the software's give static data about cultivating, they require enormous number of looking through strides to get the exact data and they don't give an intuitive method of questioning and reaction [2].

This framework which I proposed will beats the previously mentioned disadvantages by giving a UI, where ranchers or some other clients can cooperate successfully to get the ideal reactions with minimal knowledge [3]. There are around 14 crore ranchers in India. The circumstance may be changing quiet directly in front of us The Internet And Mobile Association of India(IAMAI) survey denotes approximately 12 crore individuals in rustic India who are using to web through their mobiles [4] [5] [6]. There is enormous change anticipated in the manner the ranchers will get to data. These turns of events uphold the development of Farming Bot. The focal point of this undertaking is to build up a talk bot which will give help and direction to ranchers utilizing NLP. This bot will answer all their questions identified with agribusiness practice and innovation.

1.1 Motivation

The main motivation of this work is to help the agronomists to grow the suitable crop in their yield and to get updated in weather information. We can notice in television and newspaper and also in real-time how farmers struggling [5]. Most of the country's GDP depends on the agriculture India also one of those countries so that I am impressed to propose this model for rural countryman.

2. BACKGROUND

In this proposed system I have used google dialogflow it provides tools to develop the applications, and for the database I have used firebase as well as google sheets for some of the data and the backend programming is java script and json [6].

After creating the agent intents and entities for farming bot user will request the required data that will be redirected from either intent response or from google sheets or from the firebase database. To connect to the firebase database, we need to edit the existing js [6].

3. REQUIREMENTS

3.1 Hardware requirements

- 2GB RAM recommended (minimum 1GB)
- Processor: core 2 duo or higher version

3.2 Software requirements

- Google Dialogflow Account
- Firebase Account
- Data about farming
- Microsoft windows 10/8/7(32bit or 64bit)

4. PROPOSED SYSTEM

In this section, the architecture and the process of the farming assistance bot and the tools used for the connection and the methods applied were explained. Google dialogflow provides different types of webhook calls and fulfillments to connect to the external API's as well as firebase databases [7]. In this proposed system I have used Firebase database connection for soil and crop information of the tamil nadu state districts and External API call for the weather information.

4.1 Overview of architecture

Figure 1 shows the architecture of the farming bot assistance system connections. Where the users will request the data from messaging platform. Agent will capture the request from the users and get the response from either firebase database or weather API accordingly.

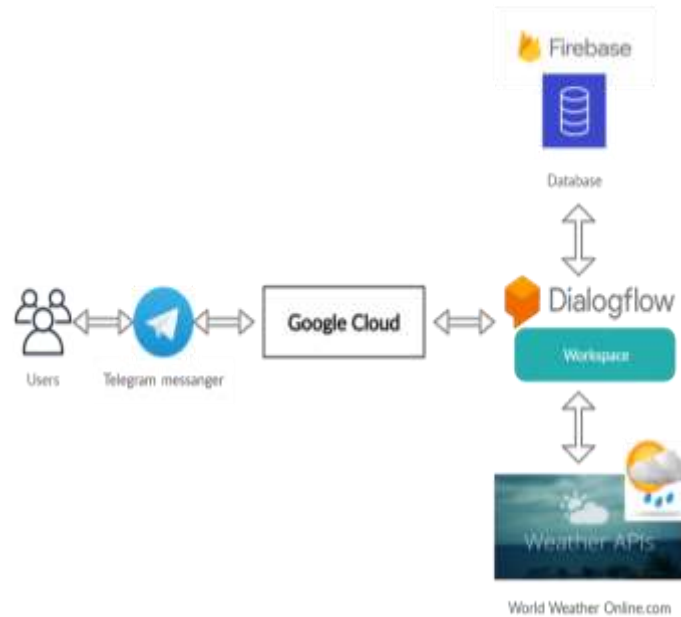


Figure 1: The architecture of Farming bot Assistance

Here the user will get the required data from telegram messenger because I have connected farming bot with the telegram by using token key generated by bot father [8].

For the firebase database I have collected all the soil details and crop details from the internet and then I created firebase database and stored all the data in the datasets. After storing all the data into the database. We need to connect the database to our dialog flow fulfillment for getting and posting the farming details to the users [9]. In addition of the crop and soil information here I have added mini bot called weather bot for that I have to get the API key from the weather site called World Weather Online(WWO) [10] which will gather the weather details across the world and through google cloud and dialog flow it will fulfill the user needs.

4.2 Query Handling

User queries of sentences will be converted into word by tokenization and the stop words like the, are, for, of, etc. these words will be removed by NLTK corpus after this process the agent will convert the words to root words for quick search [5]. If the words like promote, promotion, promoted will be converted into root word as promote then the response will be delivered according to the query word user has requested to the bot.

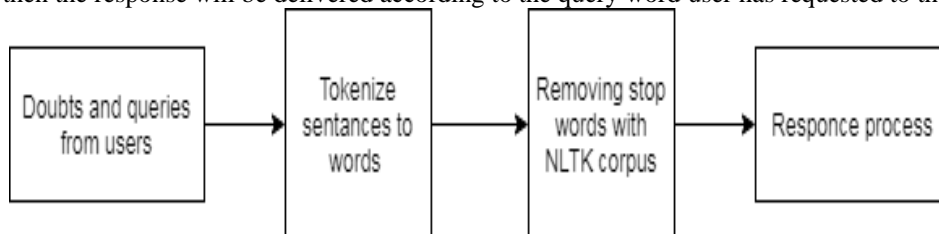


Figure 2: Query handling

4.3 Bot Training and Development

To develop the bot, we should create the intents and entities which are the training phases to help users or farmers. Intent has the fields like response and training queries set [11].

And also, i imported .csv file to my project for bot's quick understanding of the queries and respective answers for that and it will be tokenized as we discussed previous module. Then we should train our bot and the queries and responses will be stored in the firebase database which I have created for quick replies [13].

For weather information I went for the API call with online weather applications using API key.

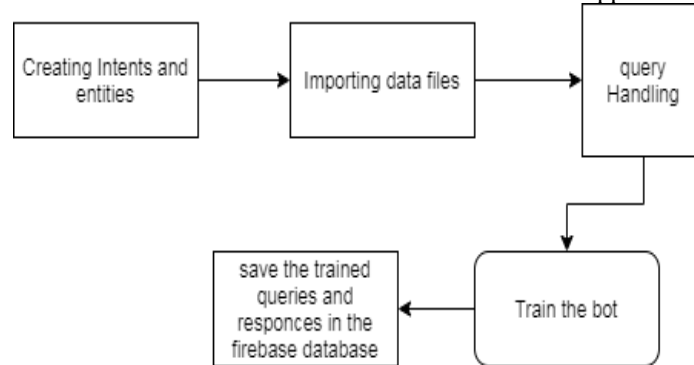


Figure 3: Development and training

4.4 Soil and Crop data request and response processing using firebase database

In this process I have used

- Dialogflow
 - For the workspace to train the bot and develop the intent and entities.
 - To import the training phases
- Firebase
 - To store the data of soil and crop of the particular city or district in the database
 - And to serve the response to the agent using fulfillments
- Fulfillment
 - To connect both the dialog flow and firebase using key and GCP

User will request the soil or crop information of the particular district from the telegram where i imported my bot. Dialogflow agent will get the request from the user and from the fulfillments section the request will be dispatched to the firebase database which had connected to the dialog flow agent [12] [15].

I was created the dataset in the firebase by collecting all the soil and crop data of all districts like what are the soil types in particular districts and what are the suitable crops in that area. From the firebase database the data will be recognized and send back to the dialog flow agent by using fulfillments the response will be served to the users by the agent accordingly.

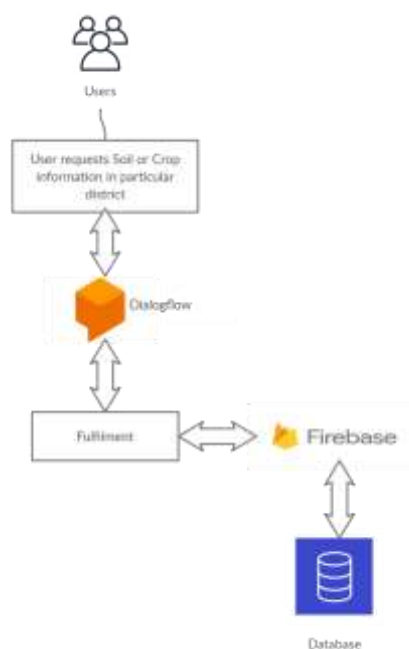


Figure 4: Request & response processing using firebase database

To make the connection of Google Dialogflow with the firebase database we must need Google Cloud Platform (GCP) and we must write the JSON code in the fulfillment section with the key from firebase [11].

4.5 Getting Current weather information using API call

For the API call we need

- Online Weather API
 - To get the weather information across all cities in the world.
 - To be get connected to the webhook call by using API key.
- Dialogflow
 - To get train the bot to get the queries and requests from the users with the city name
 - And to serve the response
- Fulfillment
 - To connect both online weather API and dialog flow with the API key.

Here I have used World Weather Online (WVO) which is the free platform to get all the weather information across the world and Inline editor to connect both weather API and dialogflow

To get the API key we have to sign in to the WVO, By using the API key we can able to connect with the fulfillments. In the dialogflow fulfillments I have used my API key to make the connection with the dialogflow and for this we have to code in JSON. We can design the response as we need [14].

The connection will be established and I trained my bot with the request like “what is the weather in New York” by using the intents and entities some amount of queries will be trained and uploaded .csv file into the dialogflow agent and the user’s request will be dispatched to the WVO by using Weather API key and the search will being in the web application. The result will be served to the user end as eg: “weather in new are are 24 degree Celsius” like this the user can able to get the data all over the world by sending request to the bot. For the fulfillment we must use Google Cloud Platform (GCP) as we can monitor all the activities in the google cloud dashboard.

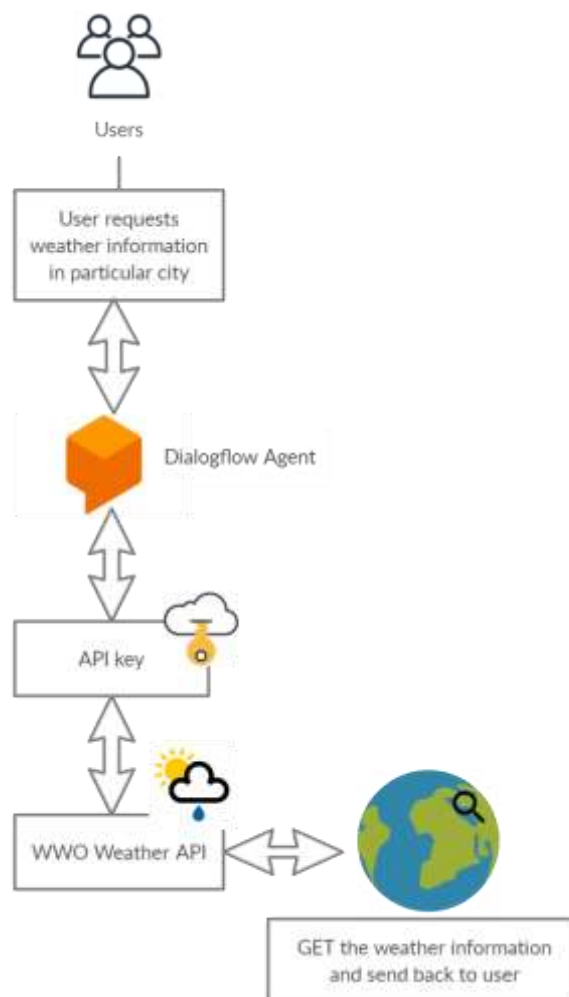


Figure 5: Getting Current weather information using API call

5. RESULT AND DISCUSSION

In this section I discussed about how to connect our Farming assistance bot into telegram and what will be the result after the deployment [12].

5.1 Conversation Interface in telegram

Telegram Bot Application Programming Interface[<https://core.telegram.org/bots/api>] permits the production of chatbots competent to associate with their informing framework. Wire Bots are uncommon stage accounts that don't require an extra phone number for arrangement [16]. These records fill in as an exchange interface fit for executing directions modified through their API. The Telegram itself utilizes a bot called (BotFather), in view of rules for the formation of the others. Toward the finish of the cycle, an approval token will be granted, so as to guide the received messages to the bot made [10].

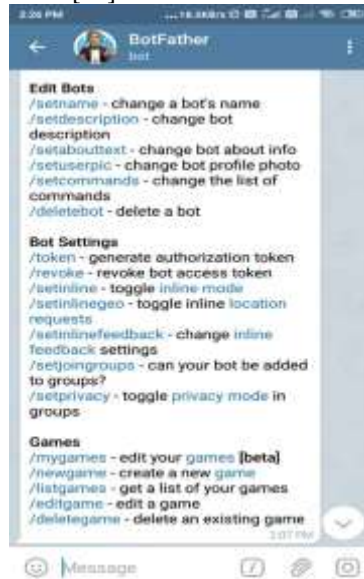


Figure 6: Bot Father setup wizard

5.2 Output

Section 1: Greetings

For an underlying cooperation with the bot, a welcome connection example was created so as to make farming Assistance Bot more open to the client, showing itself accessible and arranged to help the conversationalist.



Figure 7: Greetings text response

Section 2: district selection for information

To make the user's conversation easy here we seeking for district name to get the detailed information about that particular district.

After giving the district name we provide menu to choose which information the user needed in the selected district.

Section 3: Request and response

A menu of alternatives can be offered to the client on the off chance that he picks a more instinctive and direct interface, in which buttons are shown for the communication with the bot. This was just conceivable due to the telegram API assets library node-telegram-bot-API. This component was executed distinctly to increment the convenience on the off chance that an immediate admittance to the bot assets is required. The choices and highlights gave by the menu can be seen in (Figure 8)



Figure 7: request and response with menu

From this menu we can select either one to get the information about our district

- Soil in (district name)
- Crops in (district name)
- Weather in (district name)

Case1: Soil/Crop information

Through the request the interaction begin by Wireless Sensor Network (WSN). Farming assistance bot can request the data by using WSN technology and the response will be served accordingly



Figure 9: request of soil/crop information in a particular district

Case 2: Weather request

User can either click on the “weather in district name” or they can manually type “weather in city name” to get the detailed information about the weather in that particular area or city. The whole process will be done through API call to the WWO API.

As you can see in (figure 10) the request for the weather in New York that request will be sent to the World Weather online through API key provided by the web application as we have used that in the fulfillment and coded in Json to stable the connection.

We got the response with the state of cloud’s highest temperature and lowest temperature in Celsius or in Fahrenheit. This WSN technology is useful to get any information across the cities in the world by simple text request.



Figure 10: Weather Information

6. CONCLUSION

Building an adaptable, consistently accessible and constant responsive framework that fulfills the data needed of village side countrymen is an issue, and the main thing is agriculture is the major process especially in india it is a much-needed source to grow the economy. To overcome critical farming problems, we proposed Farming assistance bot which the farmer can get any of the farming related data by just few clicks with their mobile.

It is conceivable to accomplish the destinations, visualizing a palatable answer for farmer’s request/query and showing the information on a Wireless Sensor Network (WSN). In view of the utilization of Natural language processing (NLP) that joins the function of the smart messaging administration platform Telegram and intensity of the intellectual administrations framework Google dialogflow and Google Cloud Platform (GCP).

Hope this try may help fellow countrymen to get knowledge on farming and to get information on the particular thing in particular area by using mobile phone.

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