Artificial Intelligence Based Farmer Assistant Chatbot

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Abstract: **Automatic talk bot will be created. The Automatic talk bot will be able to answer user questions without any human assistance. These talk bots will be trained with different type of questions. When user types a question, it will apply Naive Bayes algorithm to identify appropriate answer from list of trained question. The talk bot provides answer to the query of the farmer. The farmer will have any query; the bot replied the corresponding queries by the way of chat and voice. If the farmer has any query about the agriculture, the bot will send the answers to them through the voice or text, If the farmer needs any route assistance, the bot will show the route for Google map. In case the farmer forgets agriculture related details or some important queries it will remind the farmers.**

Keywords: **Artificial intelligence, K-nearest neighbor, Naive Bayes, Talk bot.**

1. Introduction

Artificial Intelligence with the help of machine learning could facilitate the farmers with virtual assistants who could help them in real time. They could be able to interact with the farmers in their native language so that they can understand them well. This will educate the farmers at any point of time. Farmers could be leveraged to take advice and recommendations from agriculture pro chatbots.

AI has developed a chatbot which predicts a user query. This model uses the generative and retrieval model to predict the user query, other information like soil information, crop fertility. In our project we have applied Artificial Intelligence on data related to agriculture such as soil type, crop, climate, Estimated profit, Government benefits, Agriculture workshops

2. Literature Survey

A. An Intelligent Web-Based Voice Chat Bot

This paper presents the design and development of an intelligent voice recognition chat bot. The paper presents a technology demonstrator to verify a proposed framework required to support such a bot (a web service). While a black box approach is used, by controlling the communication structure, to and from the web-service, the web-service allows all types of clients to communicate to the server from any platform. The service provided is accessible through a generated interface which allows for seamless XML processing; whereby the extensibility improves the lifespan of such a service. By introducing an artificial brain, the web-based bot generates customized user responses, aligned to the desired character. Questions asked to the bot, which is not understood is further processed using a third-party expert system (an online intelligent research assistant), and the response is archived, improving the artificial brain capabilities for future generation of responses.

B. Smart Answering Chabot based on OCR and over generating Transformations and Ranking

With rapid development of information and communication technology, people are very diverse in education, learning style, and knowledge improvement methods. This paper presents an approach of converting documents into knowledge of Chatbot system that enables users to make more benefits of it by asking and answering questions through the use of electronic documents integrated with simulate system. It is an integrated system for enrich contents of documents from popular format such as Portable Document Format (PDF) and digital photos. The workflow of this system is started from extracts texts using Optical Character Recognition (OCR) from files, and then generates questions via over generating Transformations and Ranking algorithm, and finally let Chatbot response to the user's question when it is matched with the String pattern.

C. Toward the Implementation of a Topic Specific Dialogue based Natural Language Chatbot as an Undergraduate Advisor

In this work, we explain the design of a chat robot that is specifically tailored for providing FAQ Bot system for university students and with the objective of an undergraduate advisor in student information desk. The chat robot accepts natural language input from users, navigates through the Information Repository and responds with student information in natural language. In this paper, we model the Information Repository by a connected graph where the nodes contain information and links interrelates the information nodes. The design semantics includes AIML (Artificial Intelligence Markup Language) specification language for authoring the information repository such that chat robot design separates the information repository from the natural language interface component. Correspondingly, in the experiment, we constructed three experimental systems (a pure dialog systems associated with natural language knowledge based entries, a

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domain knowledge systems engineered with information content and a hybrid system, combining dialog and domain knowledge). Consequently, the information repository can easily be modified and focused on particular topic without recreating the code design. Experimental parameters and outcome suggest that topic specific dialogue coupled with conversational knowledge yield the maximum dialogue session than the general conversational dialogue.

D. Chatbots in Education

Sofie Roose and ruth lochan (1878) proposed the chatbots in education and the survey is based on digitalizing education and reinventing the learning experience through E-learning. The pedagogical agents are used to enhance the learning and teaching and this virtual agent called hikayat land involves more provisions which included folktales and moral values. The other part in these chatbot includes the answering of FAQs through AIML it also uses the latent sematic analysis. It all emphasis on the keywords which are present and the subject and the course which were available.

E. Chatbots on Industries

Lavin Agarwal (1898) proposed on a review on chatbot offering industries and the survey is based on grouping the keywords and ads and through this Way it shows the relevant ads which the customer is searching for. And this describes the implementation of a chatbot framework with an interface to big data and also with A.L.I.C.E artificial linguistic internet computer entity. Through these keywords which are negative its helpful to avoid people seeing others ads when they search for.

3. Algorithm Used

K-nearest neighbor or K-NN algorithm basically creates an imaginary boundary to classify the data. When new data points come in, the algorithm will try to predict that to the nearest of the boundary line.
1. The k-nearest neighbor algorithm is imported from the scikit-learn package.
2. Create feature and target variables.
3. Split data into training and test data.
4. Generate a k-NN model using neighbors value.
5. Train or fit the data into the model.
6. Predict the future.

We applied Naive Bayes Machine Learning algorithm to understand the similar question in trained query. Based on the identification, answer for appropriate query will be displayed.
Step 1: Separate by Class.
Step 2: Summarize Dataset.
Step 3: Summarize Data by Class.
Step 4: Gaussian Probability Density Function.
Step 5: Class Probabilities

4. Existing System

This system fully manual work. If user have any query based on farming they need to type the query on chat box. They can take their own time to response the user. There is no proper

voice to deliver the farmer query to bot. It won't give any better solution at the time of farmer requirement. It takes much time to resolve the farmer's query.

5. Proposed System

A farmer assistant bot is built using Naive Bayes algorithm that analyzes user's queries and understand user's message. This System is a web application which provides answer to the query of the farmer. Farmer just have to query through the bot which is used for chatting and voice. Farmer can chat using any format there is no specific format the user has to follow. The System uses built in Naive Bayes to answer the query. The answers are appropriate what the user queries. The User can query any farmer related activities through the system. The user does not have to personally go to the office for enquiry. The System analyzes the question and then answers to the user. The system answers to the query as if it is answered by the person. With the help of Naive Bayes, the system answers the query asked by the farmer. The system replies using an effective Graphical user interface which implies that as if a real person is talking to the user. The user can query about the farmer related activities through online with the help of this web application. A talk bot, which is a virtual conversational assistant. Farmers can interact with the bot in a very simple manner. The focus is on developing the bot in a more intellectual way, that it can even understand not so well grammatically defined sentences. Bot uses the Natural Language Processing technique to parse the user queries. This bot is both retrieval and generative based. It can retrieve responses if the query is already defined in the database or it will fetch responses from the query in bot. To make the responses more understandable, the responses go through some analytical process, so that analytical responses could be generated. Bot also have an ability to understand user speech and can generate speech based outputs for user queries.
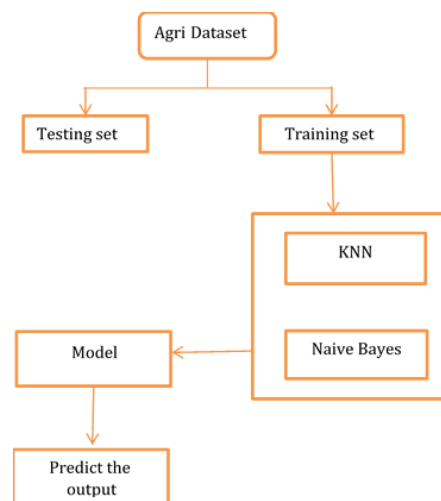

Fig. 1. Block diagram

6. Module Implementation

A. Train Chatbot

We will train the chatbot with hundreds of question and answers.

B. Mobile App Voice Input

To pass the user query through the mobile App.

C. Speech to Text Conversion

A speech recognition engine (or speech recognizer) takes an audio stream as input and turns it into a text transcription. The talk bot will have abilities to hear what user says and respond appropriately by saying it via microphone. For the talk bot to hear what user says, the speech recognition API will be used. Computer will receive a voice input which contains a structured sentence. The voice will be inputted to speech recognizer. Several examples of the recognizer that can be used such as Google Speech Recognition API. The output of the recognizer would be a chunk of text or copula or a JSON object which contains the text output.

D. Http Request with Text

Web servers handle these requests by returning response messages that contain the requested resource.

E. Text to Speech

Bot would not be so human without ability to speak. As a machine that only knows 1 and 0, but can only talks if it is designed to. Text to Speech (TTS) is one of the ways to make computer talking. The input to the TTS API (Google TTS) would be a reply text from bot API. The text would processed by TTS API and the output would be a voice file which contains an appropriate response to the input from user.

F. Agriculture Data

Collect the farmer queries and train the datasets.

G. Pre-process Chatbot query

We will remove stop words using NLTK corpus. Perform stemming to identify similar words.

H. Machine Learning Algorithm

We will apply Naive Bayes Machine Learning algorithm to understand the similar question in trained query. Based on the identification, answer for appropriate query will be displayed.

7. Results and Discussion

Fig. 2. Result

The proposed system is fully automated the query will be answered basis the question and knowledge base automatically. hence no need to have a person to answer the queries and ease for the users to interact with queries. Farmer can interact with the talk bot in a very simple manner. The focus is on developing the bot in a more intellectual way that it can even understand not so well grammatically defined sentences. Bot uses the Natural Language Processing technique to parse the user queries.

8. Conclusion

This work introduced the fundamentals of chatbots and it gives an overview about ideas, products and platforms both from the past and the present works. The current interest in chatbots, its influence in agriculture, its advantages and the limitations were being discussed here in detail. Different aspects of the implementation of a chatbot and its working with conversational interfaces have been presented through the creation of an exemplary chatbot, which included interaction, the user experience design and a general reusable software architecture of chatbots.

The goal of the project was to give an overview about the chatbots, its welfare for agriculture, and its uses for farmers. This knowledge helps exploring further possibilities of chatbot usage in agriculture and it enables farmers to apply chatbots to new scenario and thereby it improves efficient and an effective way of farming.

9. Future Works

1. Chatbots will be almost indistinguishable from humans. According to Gartner, chatbots will power 85 percent of all customer's service interactions by the year 2020. NLP will grow more efficient, capable of handling more complex commands and delivering more poignant outputs. Chatbots will also be able to have multi linguistic conversions, not only understanding hybrid languages like 'HINGLISH' with NLU but with advanced NLG we'll also be able to reciprocate.

2. The biggest development in future chatbots will be of creating 'sympathy chatbots'. To bet on conversational UIs over top based products as free of endless navigations, unbounded experience for the users, on track right from start, listen and learn are the efficiencies in future.

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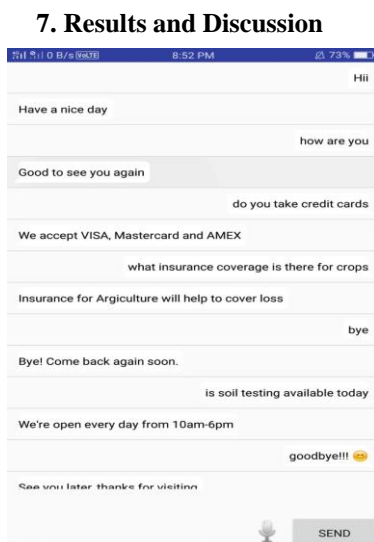
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