Farmers Agriculture Assistance Chatbot

Praveen Kumar Maduri[1, a)], Preeti Dhiman[2, b)], Manas Raj Shukla[3, c)], Saurabh Anand[4, d)], Siddharth Pratap Singh[5, e)]

[1,2,3,4,5]Electronics and Instrumentation, Galgotias College of Engineering and Technology, Greater Noida, Uttar Pradesh, India.

[a)] *praveen.kumarmaduri@galgotiacollegee.edu*
[b)] *pre.dhiman@galgotiacollege.edu*
[c)] *manasrajshukla@gmail.com*
[d)] *saurabhanandofficial@gmail.com*
[e)] *siddharthzx25@gmail.com*

Abstract- India has an impression of global Strength of agriculture in the world. Despite the fact that the practices and methods in Indian Agriculture lack modernity in terms of seeds, Fertilizers, educating people about the needs and practices related to farming and several other techniques. The area under agriculture is falling steadily because people are not able to get certain ideas of efficient farming. This Research is directed in the field of Farmers to provide basic information and needs in crop management. The work in this project is focused on building a Chatbot structure which helps farmers or any individual even not related to farming. With the help of NLP, the chatbot feeds data directly to the customers according to crop needs and provides information on many other management techniques for obtaining healthy and good crops. The Data for this Chatbot is extracted from ICAR which is "The Indian Council Of Agricultural Research"

INTRODUCTION

The main motive behind the making of this chatbot system is the reliability of AI. Since one can easily collect and store data in form of datasets and can directly upload over the cloud so the data is easily accessible [1]. The feasibility of the system makes it a reliable resource in the field of agriculture. First of all, there is absolutely the need of more people to go into agriculture. Land area remaining is not constant, returns from agriculture is going to package in the coming years. Around 52 percent of Indian households are involved in agriculture - this needs to be overlooked as to grow up for farmers to have a profitable and sustainable future [2]. Also, the farmers need to have self-help groups or cooperatives to ensure their needs and resources. India desperately needs investment in supply chain and irrigation. There may be no problem in private investment in supply chain - it might even be more profitable for all parties if points are implemented. People Agree that the agriculture workforce needs to be moved to industrial sector but that should rather be a pull strategy (through increase in manufacturing jobs) as opposed to a push strategy without having enough jobs to absorb them. People think that talking about FPO's and for them to be successful the farmers have to be imparted with required KSA's to understand the dynamics of Supply-demand and which crops to grow in a given year. At the end of the day it is clear that the country has to keep in mind that agriculture is a highly unpredictable profession heavily dependent on weather [3]. A day of unseasonal rainfall can destroy months of effort. Hence, as a matter of fact the govt. Cannot totally move away from the sector and leave it to Pvt players who will never have their interests at the forefront. On the other hand, a system can, be made for convenience which predicts nutrients requirement, fertilizer usage requirement and crop in the area according to the soil and weather. The Farmers agriculture assistance chatbot primarily focuses on their elements and provide the working farmers to gain some extra knowledge about the crops as per their needs [4].In the USA there is sprawl, because land is plentiful and cheap. In Europe, there little sprawl, cities are very compact. Israel is extremely densely populated, full of settlements on mountaintops, but it's still self-suficient in food production. That's possible because its agriculture is very effective. The market will always keep the balance, if there wasn't enough food, people would use land for growing crops instead of building factories on it. However, because there's a global surplus of food due to high productivity, its price is low and people can use it up for sprawling urban areas. What's more, it's likely that the land will never run out, because global population will start declining in this century. There is a doubt that there will ever be a shift to vertical farming. The future of farming will always lie in increasing productivity, using and

creating new, genetically modified crops. There are huge swathes of potentially fertile land which are now covered by rainforest. [Tropical farming] is a big challenge, because the constant rain leaches all nutrients from the soil. If we could one day devise a method how to make the former rainforest permanently fertile, it would be a huge step forward.

LITERATURE SURVEY

Time for Artificial Intelligence

As, Artificial Intelligence makes assumptions on the basis of analysing previous algorithm and reduces the process time. The use of AI increases dramatically and with more accuracy. Plus, another AI. Strategies that make progress in all areas including agriculture. Among the selected estimates about how AI will perform strengthen the important person and without changing his or her opinion. Now a days, AI is used in various sector for solving complex problems that are the functions of many factors. Similarly, AI in agriculture can solve various issues that can be easily determined by factors such as weather conditions, pesticide (according to recent insect attacks, climate conditions), computations of amount of water need for irrigation as per land area and the number of external fertilizers [4].

A.I. Through Chatbots As Well Recovery of Machine Intelligence

Human generated artificial intelligence on machines can be a separate checkbox. Includes the creation of equipment that may update information. To do this, be flexible experience in planning and implementing a simple A.I. chat conversations are formed. The paper shows the current method of making A.I. they are also unsatisfactory provides a hypothesis used to test the machine knowledge, to shed light in the very limited time of the wise frameworks [8].

Smart Answering Chatbot Based On OCR

So far, it is known that the immediate evolution or say growth of knowledge and also the communication in technology, people are insignificantly characterizing education, way of improvement and its enlightenment development techniques. This review of the paper lets us to know about the that there is a way to change the documents form and its subject into agreement of a Chatbot like system that allows people to invest more into the system simply just by asking questions/queries with the help of an electronics-document-integrated system with human-made system [6]. It is a desegregated structure for taking contents from documents i.e., from the portable document format also known as pdf format also it takes contents from digital photos. It is stated that the organized structure of this Chatbot starts with taking contents from various files using OCR which is optical character recognition. Then the system bring about changes plus ranking the rule and henceforth any individual can get answers supporting their query [7].

Development of Chatbots Using A.I.

As a matter of fact, says everyone is dependent on agriculture production (one way or another) for food and also fabrics it is also the major field for employment of many people in many parts of the world. Individuals depend upon the daily practices of agriculture and its production because it is a way of life for everyone. This paper is based on a chatbot system which works on training the bot via sets of data and knowledge [5]. With the help of a neural network working and processing a connection is established and the error values are measured with the help of a gradient descent algorithmic log values. The dataset which is in the form of a test subject then undergoes a pre-processing stage or a set of stages and a neural working stage. Calculations are done on the basis of the class with the highest probable outcome given and the function is performed repeatedly one after the other. It gives accurate and point out results. It then gives the user a predicted value of algorithm which is known as ARIMA i.e., Auto Regressive Integrated Moving Average) that predicts the future values which is the upcoming cost of the agricultural products using the so called moving average system technique so that the farmer or any individual can look for something to plan activities for harvesting needs[9].

OBJECTIVE

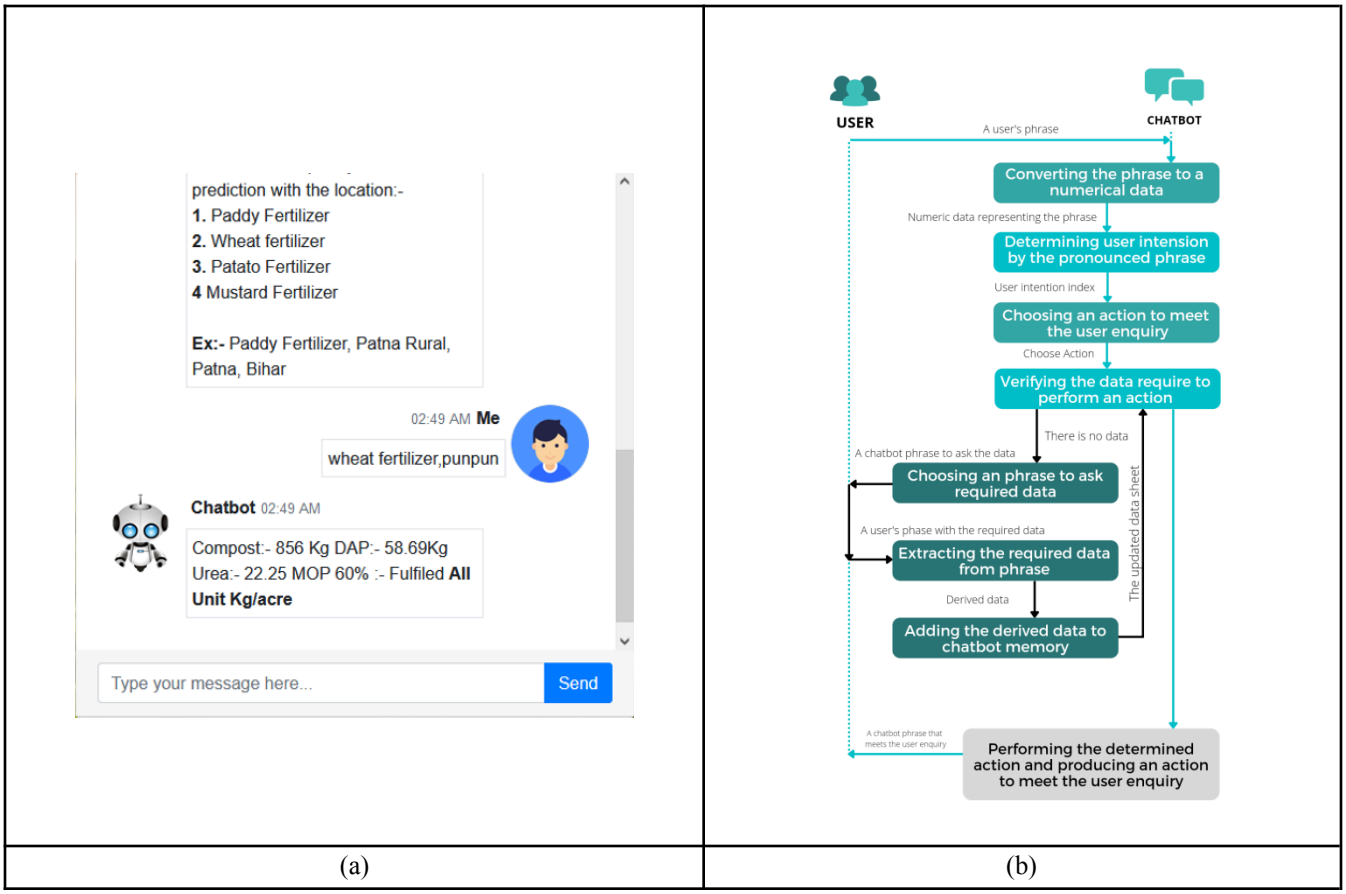
There are dozens of chatbot services over the internet which can be seen on daily basis and which people normally use in their mobile phones but in actual the use of chatbot system can be taken in other fields to and here the main motive is to create a functioning chatbot on which farmers can rely on . A structure which give the most needed answers to questions asked by any individual trying to extract the basics in farming. The proposed Chatbot will help in the following:

- Fertilizer Doze Predictor
- Best Crop Prediction
- Crop Selection

through the application of Natural Language Processing in "Chatbot". The intention here is to continue creating and develop a model that increase the relevance for the farmer queries.

METHODOLOGY

In the "Farmer chatbot", where the user asks any question from the structured chatbot system interface in form of human text values. The Chatbot interface receives individual's utterance and works on the form to extract intents, decode the message and then based on calculations converts the phrase to a numerical data determining user intension by the pronounced phrase then it works for choosing an action to give the user a satisfactory answer to the query. It then verifies the data require to perform an action. The bot then performs the determined action and produces an action to meet the user enquiry. If there is no data, the bot then saves the phrase and extract the required data from phrase and then adds the derived data to the chatbot memory.



(a) (b)

FIGURE 1. (a)*Chatbot Interface and (b)Chatbot Architecture*

System aarchitecture flow of chatbot:

1. The user has to input a query in form of text.
2. Text then goes under a pre-process stage.
3. Next is stemming where chatbot finds the motive.
4. Chatbot reply based on calculations.
5. Message form is saved for further query.

Chatbot must go under various development and training in order to give the vest results. Datasets are used in retrieval of data response related to the question. In creating this chatbot the main target is to provide answers for agriculture related questions. Any query out of context may give absurd results. Along with datasets Chatbot corpus data is used for greeting

purposes and for better individual interaction. For fallbacks or when the bot is not able to understand the user, corpus data is used in order to create useful response, so the user understands the very use of this chatbot.

Natural Language Processing

Natural Language Processing is getting computers to use and understand human language and speech, such as English, French or another “natural language”. For example:

- Any voice recognition, speech synthesis, or question answering program like Siri. You can speak to a computer, and it understands user’s voice.
- A computer program that reads company reports or health records in plain English and produces numbers from them (e.g., profit this quarter)
- If you upload your CV/resume to a job site sometimes it will automatically get your name and past employers from the document and fill out a form, even though different people could have formatted the document differently.
- Google Translator
- a search engine like Google which gives you documents when you type a word into the search box. Note that when you search for cat, Google will give you documents containing cats and even feline.

Note that for the last example, an engineer will have given Google's software the information about English synonyms and English plural patterns. Natural Language Processing is a kind of Artificial Intelligence. If someone want to build an NLP program, they can start writing rules like "ignore an s on the end of a word". This is the old school way of doing things and it's called the "rule based" approach [10].
However, the more advances techniques use machine learning, where programmer can program their computer to learn patterns in English. If user do this, they could even write their program only once, and train it to work in many human languages. NLP aims to make computers understand natural language, and read/write/listen/speak just like humans. Part of it is standard grammar and spelling rules, but natural languages have a lot of complications. Words can have multiple meanings depending on context, "do x and y and z" does not explicitly specific whether you have to do them in order, A "simple" application could be a chatbot of course, virtual assistants, Another application would be in combination with image recognition: it can be used to detect birds, birds who look to the left, birds with a greenish blue spot on their breast. The other way around, we would like to describe a bird, and have the computer generate a bird that matches a complex description.
Natural Language Processing is a technique used by the computer to understand the human language in their casual form, that are further break down and correlated with the feed database for further required function to happen. NLP reduces the cost & increases efficient operations. Steps involved in NLP:

- Reduction of tokens
- Noise removal
- Dictionary correction
- Voice Bag or Vector Space Model

This proposed paper is in the field of Agriculture as Farmers Agriculture Assistance Chatbot system which will help individuals take information about lands, soil, crops and agricultural practices along with nutrients composition for the crop. The Calculated data fed to the Chatbot system provides point to point reference and a structured response. To be accurate firmware will analyze factors such as soil nutrient map of user locations and the sources of the data from “The Indian Council of Agricultural Research”.

RESULT

Chatbot making and training using the NLP processing involved the use of a Web Based IDE. The Creation and structure modelling using GUI libraries helped enable a chatbot system that can perform specific tasks. Any individual can ask questions to the chatbot system on the selected interface and get results on the basis of crop nutrients and fertilizer usage for specific crops. To create an accurate chatbot system nutrients for crops datasets were provided of certain crops and greeting message scripts were written in offline mode to provide better functionality.

CONCLUSION

Chatbot in Agriculture practices can have a major impact in the field and can affect day to day life of farmers. This may severely impact the market since the information stored on the chatbot is vast and provides solutions to farmer related queries. This may help people to follow best practices and improved productivity. In future, there can be several

alterations, many new ideas can be implemented for better functionality. Features like multi-language-based system, Voice activated, image recognition etc. Changes can be made in the chatbot system for the query part as well as the response part based on better understanding. Well everyone seems to believe one day the future generation will have perfect AI translators that can handle every language flawlessly. Except that case is hard to achieve and imply. Some words and concepts don't exist in English (or other languages); the AI won't suddenly be able to create new terms that everyone understands. But As time passes the future may get to see new alterations and easy deployments as well as reliable implementation and resources.

REFERENCES

[1] Bang, Jeesoo, et al. "Example-based chat-oriented dialogue system with personalized long-term memory." *2015 International Conference on Big Data and Smart Computing (BIGCOMP)*. IEEE, 2015.

[2] Arjun, Kekane Maruti. "Indian agriculture-status, importance and role in Indian economy." *International Journal of Agriculture and Food Science Technology* 4.4 (2013): 343-346.

[3] Jain, Naman, et al. "AgriBot: agriculture-specific question answer system." (2019).

[4] Gaikwad, Sharvari, et al. "AGRI-QAS question-answering system for agriculture domain." *2015 International Conference on Advances in Computing, Communications and Informatics (ICACCI)*. IEEE, 2015.

[5] Niranjan, Prashant Y., Vijay S. Rajpurohit, and Sanjeev S. Sannakki. "Question answering system for agriculture domain using machine learning techniques: literature survey and challenges." *International Journal of Computational Systems Engineering* 6.2 (2020): 91-99.

[6] Mostaco, Gustavo Marques, et al. "AgronomoBot: a smart answering Chatbot applied to agricultural sensor networks." *14th international conference on precision agriculture*. Vol. 24. 2018.

[7] Rajkumar, R., and M. V. Sudhamani. "Content based image retrieval system using combination of color and shape features, and siamese neural network." *International Journal of Innovative Technology and Exploring Engineering* 9 (2019): 2278-3075.

[8] 8Vijayalakshmi, J., and K. Pandimeena. "Agriculture talkbot using AI." *Int. J. Recent Technol. Eng* 8 (2019): 186-190.

[9] Sharma, Vibhor, Monika Goyal, and Drishti Malik. "An intelligent behaviour shown by chatbot system." *International Journal of New Technology and Research* 3.4 (2017): 263312.

[10] Sanglap Sarka R, Venkatesh Rao, Baala Mithra S M, Subrahmanya VR K Roa, “NLP algorithm Based Question and Answering System”,IEEE 2015.