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AGRICULTURE ADVANCEMENT USING ARTIFICIAL INTELLIGENCE

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ABSTRACT

The thrust of this paper is to highlight the issues in agriculture that can be solved using artificial intelligence. We have discussed the modifications required in current technologies and have proposed our model for advancement in agriculture system that can help farmers.

Keywords: Artificial Intelligence; Agriculture Advancement; Farming Activities; Advance Technologies;

I. INTRODUCTION

AI has been found useful in almost every field of work and study. It being deployed in every field makes it the next big thing and breakthrough for a smart future. In India, especially in Punjab increasing agriculture output to meet ever increasing population's demand is one of the major issues being faced today. Agricultural experts would tell that factors like climate, soil, rain along with other factors affect the output of a crop. Farmers feel immense pressure in such situations and lack of knowledge to counter the problems faced and modern techniques of farming only add further to the problem.

There have been various sorts of efforts to implement artificial intelligence and check the innumerable effect it has on different aspects like production time, assistance, output etc. We have seen field of medical science specifically benefitting from the implementation of artificial intelligence. Researchers are constantly working of technologies like machine learning, neural network to aid artificial intelligence as a product for human use.

II. RELATED WORK

If we look specifically towards the field of farming, quite a lot of research is being conducted. Research on topics like hydration characteristics of Wheat, applying machine learning to agricultural data show that farming activities can greatly benefit from AI. Every research being done aims to improve the control of input variables such as fertilizer, seed, chemicals or water with respect to the desired outcomes of increased profitability, reduced environmental risk or better product quality. Research on some specific important crops like wheat are being carried out to because crops like wheat, rice need high output to meet the mass demand and any case of crop failure means huge loss. So AI can reduce chances of crop failure due to improper farming activities. This all data is learned and used by AI. Hence a lot of research is being conducted for the same.

III. PROPOSED WORK

To solve agriculture issue, the Indian government has a helpline number (1800-180-1551), which aims to solve the issues faced by farmers as well as provide knowledge of modern farming techniques. But as we all know, the service could not provide 24x7 supports due to improper implementation as well as the huge crowd of farmers needing help. We think we have found a solution of this issue in AI via Bots. Our idea is to design a bot that can be accessed through a website, a standalone app and also in apps such as Facebook messenger, Google allow. Bots are nothing but command based assistant that respond to predefined commands. Our idea is to first implement this in Punjab. For that, we aim to create a database of crops, locations, rain distribution, problems related to each crop, and their solution. Our Bot can use this database to provide every answer to farmer that has smartphone or even a computer. This can help both the government and the farmer.

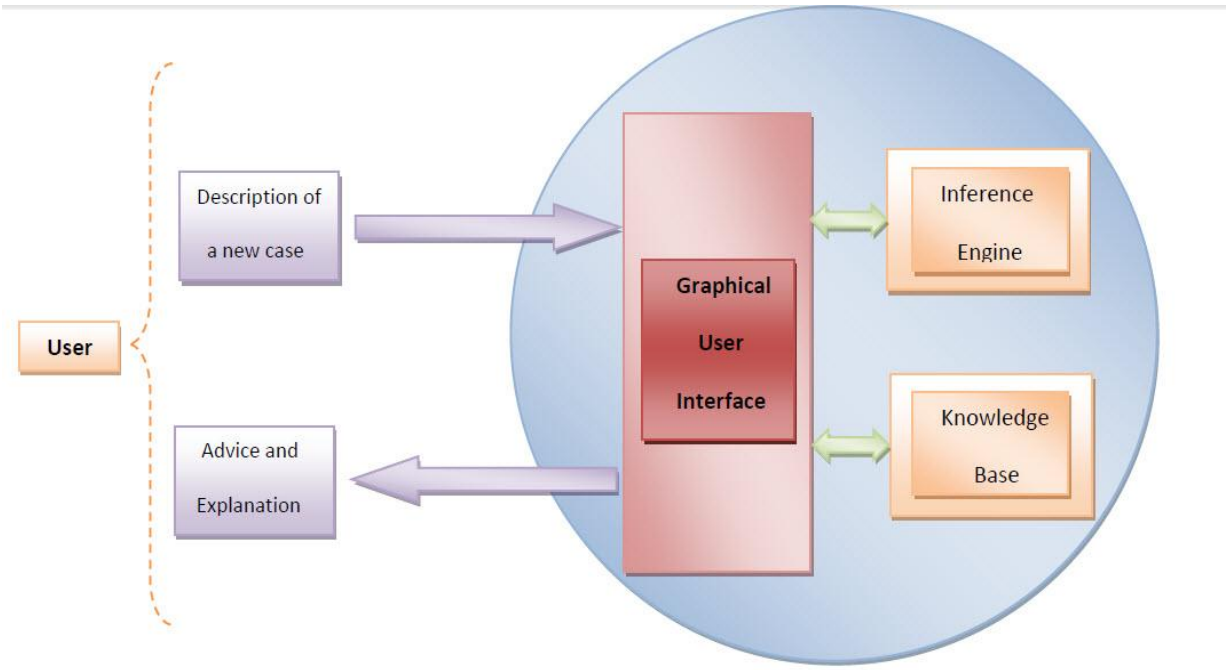

Fig.1

Proposed Bot System: The person using bot will be asked to enter data like crop, location, problems the person is facing etc. and the bot will provide solution according to data given by the user. Also the bot will be able to predict type of diseases and what precautions farmer should take accordingly. As the feedback comes, the bot will become more and more accurate.

3.1 Integrating Agricultural Expert System with Databases and Multimedia

Integration of expert system with data bases is needed to store the static data of a certain plantation. The main technical problem that can be raised due to integration with data bases is the maintenance of both the knowledge base and the data base assuming that the expert system tools supports calling a data base retrieval program. The unavailability of such retrieval program is a major problem which should be taken care of from the very beginning of an expert system project. The maintenance problem could be solved, either manually in case that the developer uses readymade package, by taking care of the data base, when making any modification to the knowledge base, or by building a knowledge and a data base management system in case that the developer uses

a tool built in house. The needs for integration with multimedia are: the enhancement of the symptoms acquisition, disorder verification and the explanation of agriculture operations. The main problem identified to accomplish this integration is the proper identification of the images, video tapes to be integrated, and the knowledge modification to link the different attributes.

3.2 Expert System for Leaf Disease Detection and Diagnosis

We aim to develop an integrated image processing expert system capable of diagnosing three disorders, Downy mildew with percentage 84%, Leaf miner with percentage 74%, and Powdery mildew with percentage 94%. Also, the system is capable of deciding the normal leaves with a percentage 98%. Moreover, the system is capable to recognizing the unknown disorder with a percentage 92%. A set of features are selected to be extracted using feature extraction phase, and those features are stored in the feature database, which is designed for this purpose.

3.3 Integrating Diagnostic Expert System with Image Processing

We want to demonstrate the usefulness of integrating an image analyzer within a diagnostic expert system model through a real life example. In order to diagnose a disorder from a leaf image, four image-processing phases will be applied: enhancement, segmentation, feature extraction, and classification. In order to employ this system, the system will trained using a set of images of disorders. The system will be tested on 3 cucumber disorders .Applying this model to any other crop disorders requires only special care to be taken in order to acquire a sufficient set of images representative of these disorders for use in the training step. Integrating this model within a diagnostic expert system then will greatly reduce any error prone dialogue between the system and the user while resulting in increased accuracy in the system's diagnosis.

IV. CONCLUSION

Expert Systems can be of great help to the farmers as well as the researchers. Their efficiency of diagnosing the right disease and treatment can enhance the productivity and reduce the losses. Expert systems and decision support systems are widely used in developed countries. This paper has discussed the need of expert systems in agriculture and availability of various expert systems in various countries. The need of expert systems for technical information transfer in agriculture can be identified by recognizing the problems. But most of the expert systems are in English language. By developing an expert system in agriculture in a mother tongue of a farmer, helps him/her to know the facts and truths in increasing the production.

REFERENCES

[1] McKinion, J. M., and H. E. Lemmon. "Expert systems for agriculture." Computers and Electronics in Agriculture 1.1 (1985): 31-40.

[2] Jat, Avnish Singh, Suma Dawn, Abhinav Mishra, and Amit Kumar. "Asperger's Disorder: Application for its Treatment through Emotion Detection."

[3] D. Toppeta, ''The Smart City Vision: How Innovation and ICT can build Smart, Livable, Sustainable Cities'', iThink, Report 005, 2010.

[4] Urbanization and health, Bulletin of the World Health Organization, Volume 88, Number 4, April 2010, pp. 245-246