QASAD: QUESTION ANSWERING SYSTEM FOR AGRICULTURAL DOMAIN A SEMANTIC INTERFACE FOR INDIAN FARMERS

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ABSTRACT

Question Answering (QA) is a research area that is extensively investigated in order to deliver an accurate answer to questions posed. Searching for a clear response in the vast ocean of knowledge that is the Internet takes a long time. This is done on the questioner's behalf by the QA system. The semantic web has recently been introduced, and the web is moving towards connected data. This is a web application for farmers that allows for knowledge transformation and can aid growers in making decisions about many elements of crop management in order to increase productivity and profit margins. This application functions as an expert system that provides farmers and students with precise responses to questions about crops, fruits, market rates, weather, and other topics. Also, by reporting the newly inserted query to the administrator, the problem can be resolved. (1) Crop selection based on soil test results and market demand will be the general focus of my research. (2) Real-time weather updates through the internet (3) pesticide selection and dosage based on symptoms and climatic conditions (4) Using artificial intelligence (AI) to compare past data in order to make informed decisions. This program provides users with precise and to-the-point responses to their queries.

Keyword: - Question Answering (QA), Semantic web, Artificial intelligence (AI), Expert system, QASAD (Question Answering System for Agricultural Domain)

1. INTRODUCTION

The Indian economy is built on agriculture, and villages are the lifeblood of the country's prosperity. Agriculture is a critical component of India's long-term economic prosperity. The majority of individuals in rural areas, as well as a few in urban areas, still rely on agriculture for employment. However, they continue to face a number of issues, including a lack of timely delivery of essential materials such as seed, fertilizers, and pesticides, as well as a lack of precision information about cultivation and sufficient advise on crop diseases and pesticides to apply. India has attained agricultural self-sufficiency as a result of various agricultural revolutions.

Agriculture is really different. We propose a way for creating a farmer's data network in the domain of digital India so that technology can reach the agriculture sector. In this system, I created an interface that may be used by those who are only somewhat literate.

We concentrate on people, particularly those from rural areas, in today's quickly changing internet environment. This is mostly aimed at persons living in rural areas who are not connected to the internet. So, in order to consolidate all agricultural information in one place, we created a web-based application that would assist farmers in a variety of ways.

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Another benefit of the website is that it provides a FAQ section for registered users, as well as the ability to write in questions that will be answered in a set time frame. He can also contact export personally if he has any further questions or concerns. According on soil type, crop details, and climate details, the system will

automatically identify any illnesses and associated preventive measures. On the corresponding home page, possible decisions, preventive actions, and guidelines will be displayed.

Question Processing (QP), Document Processing (DP) and Answer Processing (AP) are the three modules that make up a standard QA system. The question processing module's key contribution is to identify the question type (who, when, where, etc.) and the expected answer type, which forecasts the sort of entity that is required as an answer to the question. Document processing is concerned with collecting relevant documents and extracting and sorting portions that contain answers, in a manner very similar to that of an IR system, as explained above. Response processing makes use of the information offered by the other modules to find the correct answer inside a passage and to rank them.

1.1 Anatomy of Question Answering System

When a user asks a question, the first objective is to catch the intonation of the words and grasp the user's need, which is a challenging task for a machine to accomplish. However, in the literature on system design, numerous techniques to designing such a system have been presented and executed. The general architecture of a QA system is explained in this part. A Question Answering System is made up of three modules: question processing, document processing, and answer processing.

Question processing is concerned with the representation of questions, the identification of question types, the discovery of predicted answer types, and the extraction of keywords. The collected keywords are then utilised to find documents that are relevant. In order to find a proper answer, the question type is used to identify the intended answer type. Document retrieval and passage identification are two common examples of document processing. This goal is achieved by a combination of keyword based matching and keyword growth, which often entails looking up the keywords collected during the inquiry processing step in a thesaurus or other resource, as well as adding related search terms to retrieve the relevant documents.

Candidate answer identification, answer rating, and answer formulation are all part of the ***Answer processing*** module. Taking the results from the selected passages and further processing them is what identifying the candidate replies entails. Parsing of the entire passage is committed for this aim. This yields a list of potential responses, which are subsequently ranked using a ranking algorithm or set of heuristics. If the answer extraction yields more than one response, the next step is to rank them. The relevancy of these answers is ranked, with the highest ranking answers appearing at the top of the list.

2. LITERATURE REVIEW

"Krishi- Bharati: an interface for Indian farmer" Soumalya Gosh, et. al.[2] through icon and reserved bag with agriculture information in English language according to user, offered the concept about how the user interacts with the system The user was shown how to create a suitable Curie and was given the outcome by the website administrator or expert. Balmukund Maurya, et.al.[4] proposes the concept of selecting the proper crop by analysing the soil quality and picking the appropriate crop based on those facts. D. Samanta, et.al[5] it gave the user an idea of how to connect with the internet using three modes: text, speech, and icon.

2.1 Need of Information Support:

The amount of data available from diverse sources is rapidly increasing, and this data is a crucial asset. Numerous resources are being used, new results are being discovered, and they are continuing to be accommodated in the form of papers and dissertations. The majority of these conclusions and recommendations do not reach farmers at the implementation level.

According to UN data, the world's urban population is on track to surpass the total number of people living in rural areas for the first time in history. When urine estimates that the swift will occur on August 16,

2008, the urban population is predicted to reach what the estimate ruler totals. By then, more than half of all Africans will be living in cities, constituting a population larger than that of Europe [1].

Agriculture is the primary source of income for more than 70% of India's people. Agriculture is a huge industry. A large amount of data has been published in books, and there is still a large amount of electronic data available today. Farmers in India are suffering greatly as a result of their inability to obtain critical information needed to assist their farming activities in a timely manner.

Government websites, farm department brochures, and radio and television broadcasts can all provide some of the necessary information. Knowledge is not reaching the farmer due to its unstructured and variable style, as well as a lack of targeted delivery methods. Because the data on the internet is unstructured and dispersed, getting any information from this massive repository takes time. The user does not receive the desired information or a specific response. To get the desired response, the user must conduct extensive research.

3. PROPOSED SYSTEM

The requirement for a strong domain specific question answering system targeting the agriculture domain is the subject of this paper. Its goal is to assist farmers in obtaining information and resolving their agricultural-related questions, hence promoting agriculture literacy. The system is built on natural language processing and information retrieval concepts. The majority of currently available information retrieval technologies provides a ranked list of documents rather than precise responses and do not permit retrieval of answers in real time. As a result, I'm concentrating on creating a system that can interpret unstructured data and provide true answers to questions like "which," "what," "who," and "where.". For example, "which diseases affect the wheat crop?", "what are the prevalent diseases in the region of India?" etc.

This QAS application is far superior to a search engine. In QAs, the user will provide input in the form of a query (questions), and the result will be determined by the inquiry. The user must discover the answer among the collected results while using the search engine. The shortcomings of the old system have been addressed in this website, where I answer every farmer's question about how to deal with any circumstance or problem that may arise while farming. Crop output and quality improve as a result of effective utilization of this information system..

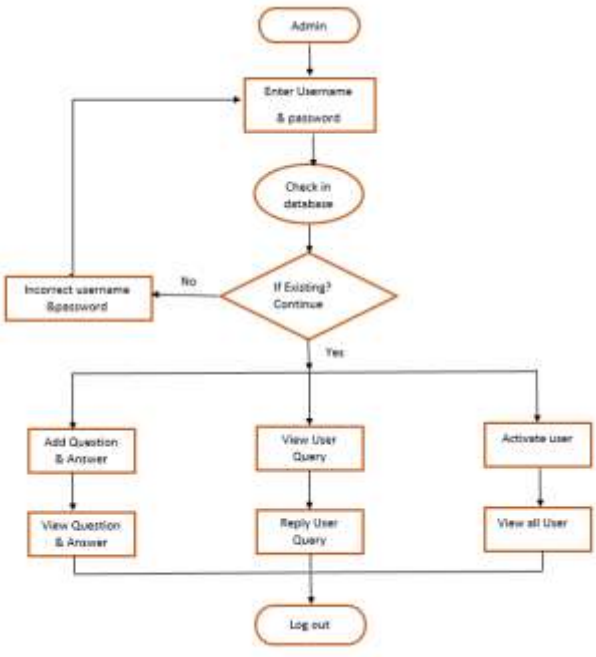

Fig -1: Proposed work-flow of system

The most basic version of question answering takes a question like "What are the best conditions for wheat?" and responds with a temperature. These kind of responses are known as named entities, and they may be anything from a person's name, a country's name, or a type of animal's name, to a date, a time, or a unit. It's also possible to ask more complicated inquiries. Other types of inquiries that a user might ask are those that begin with the letter 'wh,' such as who, why, when, which, and where. Questions like "How, how much, and how many" are also possible.

This application is divided into several stages, or modules; these modules aid in determining the program's actual flow, and the project's implementation went easily thanks to the modular approach. The Fig-1 class diagram scheme was used to produce the modular approach.

4. RESULTS AND ANALYSIS

Fig -2: Home page for QASAD

Fig -2 shows the dashboard including Admin login, User registration, User login, Portfolio, Team. On the left top corner there is logo of QASAD.

Fig -3: Query Addition

Fig-3 shows the page where the admin can add question and answer. This will be accessed by the admin only. To enter on this admin also has to enter username and password. Here the admin will question and answer. Here the answer will be given in description 1 and description 2 formats. As the admin will find any

useful information regarding agriculture then he will enter it in the form question and answer, so that the user may get updated information regarding farming.

Fig -4: Question- Answer page

This page will contain question with the answer. If there is new fertilizer in the market then information regarding that fertilizer will appear in the form of question and answer.

CONCLUSIONS

As a result, this study will pave the way for a more efficient method of resolving agricultural-related enquiries. Farmers as well as students studying agriculture will receive a detailed response to their questions. This programme can be utilized as a smart system that works in a complex manner for the user's benefit. With a simple press of a button, a user can get answers to his questions about crops, fruits, weather, market pricing, and equipment, among other things. Farmers will also be able to examine the questions in various portfolios, which will aid them in finding answers to their questions. Farmers receive precise responses about crops, weather, fruits, market rates, and other aspects of agriculture. This programme will assist all users in locating solutions to enquiries regarding agriculture, mostly in the Vidarbha region. This model will be a considerable improvement over current methods. This research is a first attempt to demonstrate that this type of information system is tremendously important to farmers.

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