COMPUTER BASED INFORMATION PROCESSING TECHNIQUE FOR AGRICULTURE ASSISTANCE

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Abstract: Agriculture requires modern assistance, and farmers need online solutions. A PHP and MySQL-based web application was developed to enable farmers to enter lab results and receive suggestions for soil conditions. With the help of advancing information technology, farmers can contact experts and get weather forecasts to make better decisions and achieve maximum yields.

Index Terms: Subsystem, Context Flow Diagram, Entity Relationship Diagram, User Interface, Data Flow Diagram, accurate, assistance, efficient, seamless performance.

Introduction - This project assists in automating the existing manual system. It can be monitored and controlled remotely. It reduces the man power required and provides accurate information. From a proper analysis of positive points and constraints on the component, it can be safely concluded that the product is a highly efficient GUI based component. Farming assistance allows the user to register them, enter the soil test result and get easily understandable response. The system is strong enough to withstand regressive yearly operations under conditions where the database is maintained and cleared over a certain time of span. The process made computerized to reduce human errors and to increase the efficiency. The main focus of this project is to lessen human efforts and easy management. The maintenance of the records is made efficient, as all the records are stored in the MYSQL database. The navigation control is provided in all the forms to navigate through the large number of records. E-farming involves the use of digital technologies to improve agricultural processes, increase efficiency, and enhance productivity in the farming sector.

Purpose - The purpose of this project was to develop a system farmer can enter the lab result and see what does that mean and suggestions for that kind of soil. Farmers mostly would not have much knowledge about what does those values in the soil report means. It would be easier for farmer's experts to communicate.

LITERATURE SURVEY

    a. **Existing System** - In the Existing System, there were some drawback, the entire system was to be maintained with hand the processes of keeping, maintaining and retrieving the information process was very difficult and lengthy.

    b. **Proposed system** - The Proposed System is different from existing system's technology where the area of specialization is taken into consideration for overcome drawbacks of existing system. By using proposed system, Farming Assistance with a web application and upload that records on web server.

Farming Assistance works properly and meets all user requirements. Its component can easily plugged to other system. Farming assistance allows farmer to register them, enter the soil test result and get easily understandable responses. Farmer can chat with the expert and clear all the doubt about the crops and fertilizers.

Testing Technologies – The reliability of a system is a critical factor in ensuring its functionality. To test the reliability of a web application, it is essential to run it on various devices using different browsers. To ensure that the application is responsive, it needs to be tested on devices with different screen sizes. To test forms and other aspects of the web application, the chrome development tool was utilized. These testing procedures help ensure the web application's reliability, responsiveness, and performance, which are crucial for a seamless user experience.

SYSTEM PLANNING - The entire system is divided in to small parts known as Architecture design. These subsystems provide particular services. The architectural design is basically a framework of the system that control and communicate.3-tier architecture is also called as n-tier architecture.
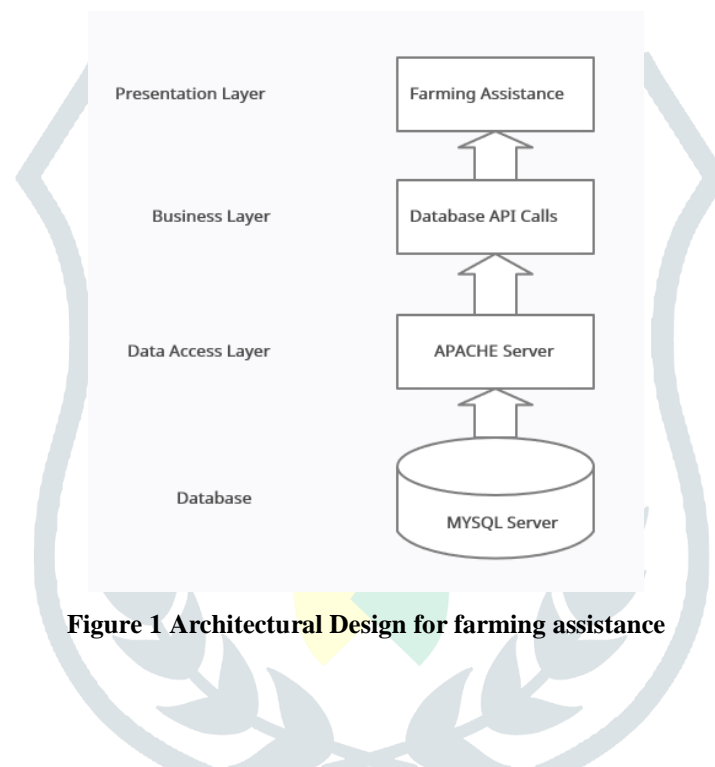

Figure 1 Architectural Design for farming assistance

Methodology -The Proposed System differs from existing technology where the area of specialization is taken into consideration to overcome drawback of existing system. With the proposed system, Farming Assistance with a web application and upload that record on web server. Farmers to post the queries they have, and experts to respond them. Farmers can also see the weather forecast, and other aspects of it.

ER Diagram - It depicts the relationship between various entities of a data model.it is nothing but a high-level structure of a database with relationships. Various notations are used to denote the different types of information in entity-relationship diagram.
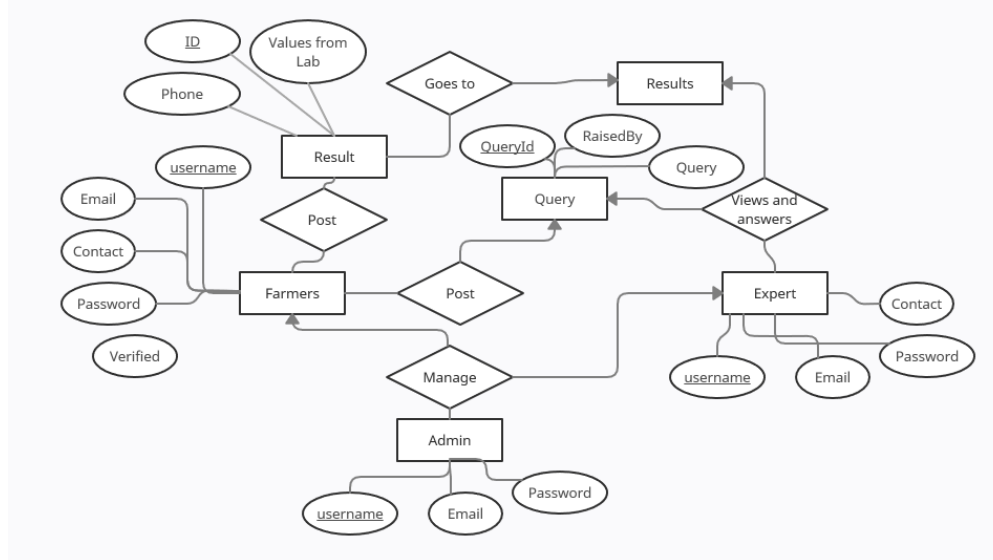
COST AND BENEFIT ANALYSIS - Cost-effectiveness of Web-based farming in order to make informed decisions about the extent to which this new media should be used in their organizations. The present study hypothesizes that there are several key design elements that should be considered in costing Web-based training projects. The relative importance of these elements is examined using a case of soil test entered in the website. The methodology used in this case study can be employed in future cost-benefit studies of Web-based Modern Agriculture Assistance. This case study also provides a detailed cost-benefit analysis, including its different features and modules in the application built.

Objective & Scope - Primary objective of the system is to help farmers to communicate with experts whenever they have any issues, also farmers should be able to enter the result of the soil test in system and get the meaning behind it with suggested crops. The designed system has been developed with five key objectives in mind. The first objective is affordability. As cost is a critical factor in the design phase, the system needs to be affordable to ensure it can be accessible to as many users as possible. The affordability has been achieved by designing it with cost-effective components and minimizing unnecessary features. The second objective is portability and ease of use. The system has been developed as a web application making it highly portable and convenient for users. This feature allows farmers to access the system from anywhere, even when they are in the field, which can significantly improve their productivity. The third objective is safety. The system has been designed to be safe by deploying it on AWS, which provides enhanced security and data protection features. By hosting the system on AWS, users can be assured that their data is protected from unauthorized access or cyber-attacks. The fourth objective is speed. The response time of the system's server needs to be quick to cater to farmers located in remote areas with low internet speeds. To achieve this, the system has been optimized to minimize response time and ensure efficient data transmission. The fifth and final objective is accuracy. The system must be highly accurate to provide reliable results to farmers. The system's design has been optimized to cater to the specific needs of farmers and ensure they receive the most accurate and reliable information, which can help them make better decisions and improve their yield. The system can be used in any remote location and could be applicable at any location. Mostly implementing the system in district wise level would help. Most of the district have agriculture department, so this could be implemented in that level to help farmers. Implementing a web-based agriculture management system can be an effective way to assist farmers in managing their agricultural activities.

DATA FLOW DIAGRAM – A Data Flow Diagram (DFD) is a graphical representation of a system that shows the flow of data throughout the system. It represents the different levels of the system and illustrates how data moves in and out of the system. DFDs provide a clear, easy-to-understand visual representation of the system, and help identify data storage locations. They are a useful tool for both technical and non-technical stakeholders to understand the system's functions and identify inefficiencies or bottlenecks.
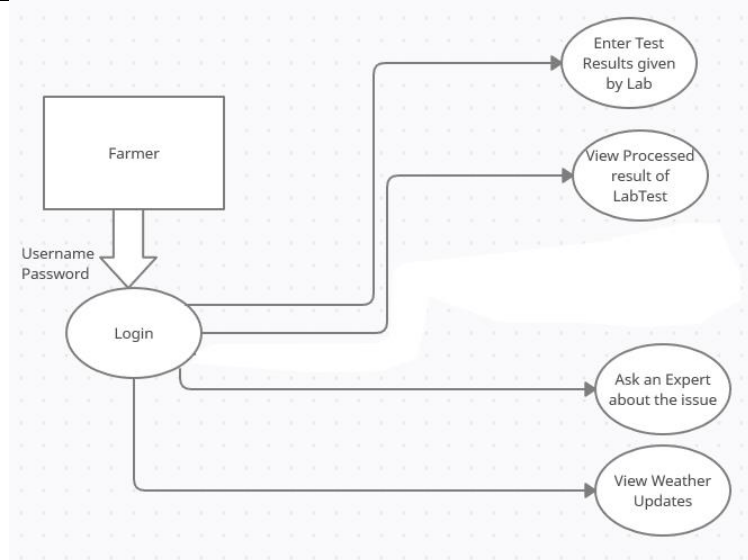
Figure 2 - Data Flow Diagram of a Farmer

THEORETICAL BACKGROUND –Modern Agriculture Assistance System for Farmers web service is a web project to help the farmers working with the motive of greater profitability by direct communication between; farmer-to-expert. This service boosts business communication and brings transparency in the system. The purpose of this project was to develop a system farmer can enter the lab result and see what the quality of the soil, and which is suitable for different season and regions. The farmers also have an option to submit their grievances and complaints to respective dealers or authorities will get access to that page regularly using their login id and passwords. The main focus of this project is to lessen human efforts and easy management. The maintenance of the records is made efficient, as all the records are stored in the MYSQL database, through which data can be retrieved easily. The navigation control is provided in all the forms to navigate through the large number of records farmers aren't able to grow crops as expected.

Design considerations -

Development methods - MYSQL server is used as the back end for the web application, while HTML, MySQL, CSS, Bootstrap, and JavaScript are used to develop the application. These technologies are essential in creating a robust and feature-rich web application that delivers a seamless user experience.

Assumptions and dependencies - When designing a web application, certain factors need to be considered to ensure a seamless user experience. Firstly, all fields should be entered in the prescribed format to ensure uniformity and prevent any errors. Secondly, all mandatory fields need to be filled to ensure that the user provides all necessary information. Thirdly, a proper internet connection is required to ensure smooth functioning of the application. Fourthly, the GUI should be designed in a way that is easy for end-users to understand and use, as this can significantly improve the overall usability of the application. Finally, in case of any error, the application should display proper error messages to guide the user on how to correct the error. These factors are crucial in ensuring that the web application functions seamlessly and provides a positive user experience. By incorporating these features, users can have a better experience while using the application, resulting in improved productivity and efficiency.

CONTROL FLOW DIAGRAM –A control flow diagram (CFD) is a graphical representation of the sequence of steps involved in a process or algorithm, illustrating the flow of control from one step to the next.
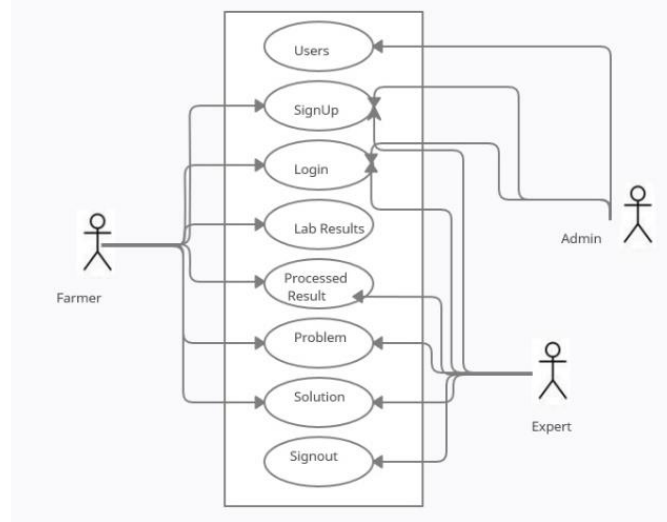
Figure 3 - CFD of the Proposed System

IMPLEMENTATION - The proposed project has 7 modules, which are Login module, Sign up module, Post Lab result, Processed Result, Interaction, and Weather Update.

The Login module requires users to enter their credentials to open the application. Upon successful login, the user will be redirected to the respective home page based on their role. Users can select different options and traverse through the app. The pseudo code for this module includes entering login credentials, checking if they are correct, redirecting to the home page if correct, and displaying an error message if they are incorrect.

The Sign up module allows users/farmers and experts to register on the site. If the details entered are valid, a unique customer identification number will be generated and assigned to the customer. If any entered data is incorrect, a warning message will be shown. The pseudo code for this module includes entering the required details, checking if the email or phone number already exists in the database, saving the data to the database, and displaying a success or error message accordingly.

The Post Lab Results module allows farmers to enter the lab results they received from the lab. The pseudo code for this module includes entering the lab results, saving them to the database, and displaying a success or error message accordingly.

The Processed Results module processes the lab results entered into the database and provides a final result based on the lab inputs. The pseudo code for this module includes entering the phone number of the farmer, showing the processed result along with solutions.

The Interaction module allows farmers to interact with experts and ask questions related to their crops. The pseudo code for this module includes entering the question, saving it to the database, and displaying a success or error message accordingly.

The Weather Update module allows farmers to see live weather updates. The pseudo code for this module includes getting weather updates from live data online.

CONCLUSION - The web application Named Farming Assistance is able to solve modern day problem which farmers are farmers. Now remote farmers have the one touch solution, they can post the queries they have, and interact with the experts which are located all over nation. Farmers were getting difficulty in understanding what does the lab result mean which they give for soil testing. Now they can post the lab result and get processed and easily understandable solution. Farmers also will get suggestions like how the soil is for certain crops what kind of things to be added into the soil such that they get optimum benefit out of it. For farmers weather update plays and crucial role. So, in this web app they will receive live update of weather as well. Thus, the system is able to solve modern day problems which farmers were facing.

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