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Smart Green House with Farmers Plaza

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***Abstract*: Issues concerning agriculture's production, promotion, and manipulation usually limit farmers' development. The handiest solution for all of the above issues is agricultural modernization and a farmer's plaza. The creation of a web portal and android app using cloud computing, and the Internet of Things in agriculture, and for promoting the products. This internet site will lessen the farmer's paintings of dealing with the farm and promoting the farming products. We keep all of the data that will be collected from sensors in the cloud and manage that data with addition to plaza into the cloud. It is designed as an internet site that lets for Gathering facts, dealing with all of the facts, and tracking in addition to promoting the farming products.**

***Keywords*: Web application, Cloud computing, Internet of Things, Smart agriculture.**

1. Introduction

Farmers Plaza is a web page and android app that is used for promoting farming merchandise that comprises vegetables, flowers, wheat, etc. It is a cloud-primarily based simply an internet utility that gives an easy and smooth manner simply so clients and farmers can talk outcomes and now no longer the use of a center man or woman or a vender. Due to those farmers and clients get preserves of greater benefits. India is an everyday agricultural USA with the productiveness of rice, sugarcane, groundnuts, vegetables, flowers, etc. Agriculture, rural area, and farmers are of precise significance in terms of socialist modernization reform.

This project works as a mediator between farmers and consumers to offer a green manner for promoting and shopping for the goods and managing the farm. In this project, recognized agencies and researchers can post their new studies and government policies which are associated with the farm which may be useful for farmers. The corporations provide some hyperlinks and authority recommendations for the farmer.

2. Literature Review

Liu Dan, Cao Xin, Huang Chongwei, Ji Liangliang - "Intelligent Agriculture Greenhouse Environment Monitoring System Based on IOT Technology" by using this paper we got how the data was collected by the circuit and sent to the database. Then how the processed data is sent to intermediate after that to PC or mobile through the serial port.

Richard K. Lomotey, Yiding Chai, Shomoyita Jamal, and Ralph Deters - "MobiCrop: Supporting Crop Farmers with a Cloud-Enabled Mobile App" by using this reference we got that to enable farmers to have mobile access to up-to-date information on pesticides and further make decisions on which pesticides to apply, how to apply them when to apply them, and so on. Due to its complexity, MobiCrop is designed as a mobile distributed system that follows a three-layered deployment; comprising mobile nodes, a cloud-hosted middleware, and a cloud-hosted database server.

Manish Wagale, Koustubh Nilje, Pooja Wadkar - "A cloud-enabled mobile and web-based application for the farmer" by using this reference we got how we can sell the farming products to customers in an efficient way without any third person or vendor.

Amjad Alsirhani, Peter Bodorik, Srinivas Sampalli - "Improving Database Security in Cloud Computing by Fragmentation of Data" by using this reference we got how we can secure our database using an Encryption Algorithm. AES 256 is the decryption algorithm that we can use for the decryption of data in the database.

Fan TongKe - "Smart agriculture based on cloud computing and IoT"- by using this reference we got how to manage the farm inefficient way to increase productivity. Also, as to how to manage all data gathered by the sensors, monitor the data, and display the desired output.

3. Proposed Work

A. Problem Definition

The reason for choosing this topic is that due to the current Corona pandemic farmers are not able to sell their products like vegetables, flowers, wheat, etc. directly to customers. They sell their products through third-party vendors. Mediator analyzes the product and decides the rate as they want to get more benefits for their business. Now they tell one rate to the farmer and sell that product to the shopkeeper or customer at a different rate because he wants more benefits. Another scenario is that farmers can't available 24/7 on the farm to check the temperature, humidity, and water needed to farm or not. By using the Internet of Things, we can efficiently manage all things with just a few clicks. Due to that, farmers can do other work as they want.

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B. System Architecture

Above structure of the Farmer's Plaza, internet allotted system. The paintings ought to now no longer comply with the stand-on-my structure due to the fact the stand-on-my-own server cannot be modified. For some purpose, the net web website online has to modify and we must keep it as a whole lot as the date. The updated Blogs and Product information that are being sent to the farmer as well as the customer is needed.

C. Modules and their Functionalities

1) Farmer Registration Module

Farmer Can Log in to the portal collectively alongside together along with his login identification and Password if the brand-new farmer at the portal will sign up on the portal and the client identity and Password will supply to the Farmer's Mail identity. If a farmer forgets his or her password, she or he may be capable of regaining that password by the use of the neglect approximately Password link portal.

Farmers can set some threshold values of temperature, humidity, soil moisture, and water level in the soil. If the values go down or high to a particular set value they will be notified by their emails. If the temperature level increased, we use fans to control temperature, and if decreases we use the bulb to increase temperature.

The farmer will add their farming products which they want to sell with the price and a photo of that product with how much the product is available. If all the product is offered out the consumer who brought that product will offer feedback to that farmer. Is that farmer's product precise or not? Based on those reviews other buyers will be able to decide to buy that product or not? Also, will give feedback to that customer so that other customers can sell their products to that customer.

2) Customer Registration Module

Customers log in to the portal with their login and password, if the customer is new to the portal, then they will test in at the portal. The individual identification and password may be dispatched to the purchaser's Mail identification. If the customer forgets their password, then they will get higher the password using the forgot about approximately password hyperlink portal.

Customers will purchase the products from farmers and give feedback to the products as well as farmers. Which will be helpful to the other buyers.

3) Admin Module

In this portal, the administrator can upload multiple admins. It's going to additionally deliver the government the functionality to do the job. If the unauthorized operation is achieved, Admin may also moreover near down sure government.

Admin could be to feature different admins and agencies. Admin could be capable of providing and taking the authority of the customers, farmers, and agencies. If any wrong action was done by any one of the admins can block them or take all the authority from them.

4) Agency Module

Inside the agency Module, Researchers add posts on new studies issues, Fertilizers, Seeds, modern-day fertilizers information, and new government policies. The use that farmers can results easily access the Seeds and Fertilizers, and expand their farm.

4. Methodology

A. Web Development

For front-quit development, we used a few languages that are as follows markup language, cascading fashion sheet, JavaScript, and Bootstrap for making the net web page more interactive, and for backend and database connectivity we used MySQL and PHP. In this case, APIs provide an interface between databases and devices. Restful APIs take the HTT requests from devices and process them in a database. The database looks for the requested data and sends responses back to the devices through Restful APIs as HTTP responses.

B. Android Development

Android studio is used for the development of the android application for smart android phones. These apps are installed through a package called Android Package Kit. Android development is done in mainly two languages such as Java and CPP.

C. IoT (Internet of Things)

IoT describes the community of bodily matters which might be related to sensors, software, and different technology to connect, process, and alternate records with different gadgets and structures the use of the internet. IoT is mainly based on three things such as collecting data, managing and processing data, and sending responses to users. For amassing data, we use sensors and for storing functions we cloud. To show results, we created an internet site in addition to an android application.

D. Cloud Computing

Cloud Computing is the on-call for the availability of pc device resources, in particular records storage (Cloud storage) and different computing powers. It allows the users to use web services and resources on demand. We used Aws i.e., Amazon web service for storage purposes.

5. Implementation

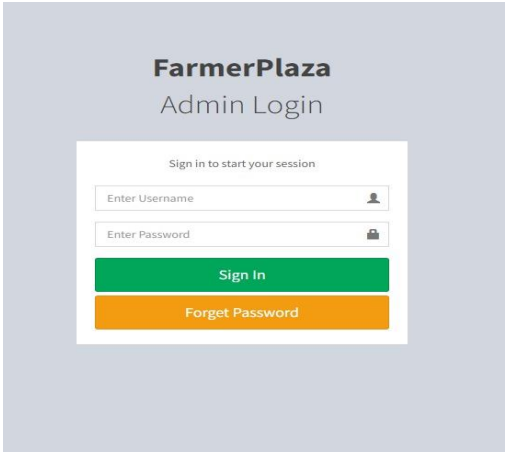

Fig. 1. Login page

Fig. 1 is the login page of an admin. When an admin will log in with their credentials, they will be able to manage all the things. Similarly, there are another three login pages which are farmers, customers, and agency. Farmers and customers will sign up using their respective portals. When they join up for the primary time, they get a routinely generated password later they could extrude that password if they want.

Fig. 2 contains a dashboard where with respective login of the farmer, customer, agency, and admin can monitor their products and other things. They can change their password. Read the blogs and notice what number of farmers and clients there.

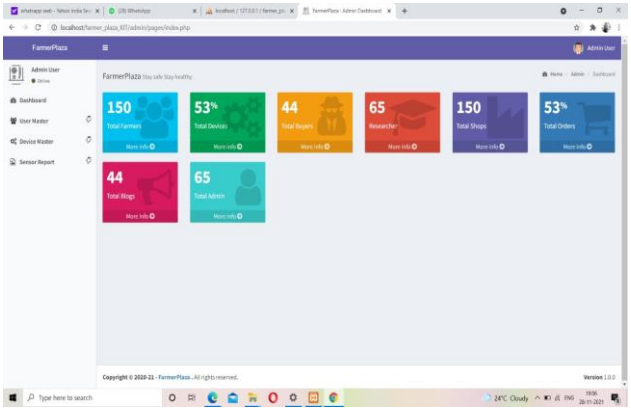

Fig. 2. Dashboard

Fig. 3 consists of a weblog published via way of means of the agency. Agency will provide the start date on which the blog is probably posted and until even as the blog is probably displayed. Blogs published via way of means of companies will be had for that length handiest and farmers and clients see them. The blog includes their new research about fertilizers, seeds, and new guidelines which may be currently added via the government.

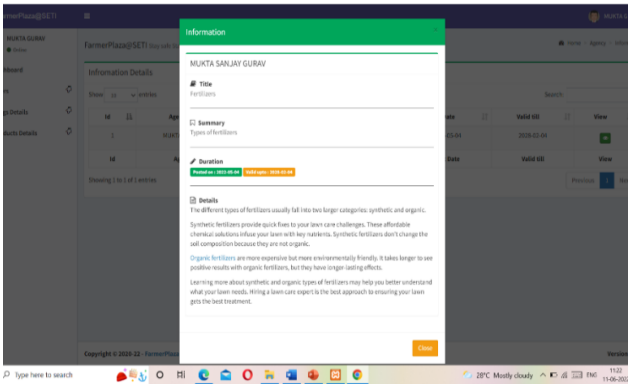

Fig. 3. Blog posted by the agency

Fig. 4 consists of the hardware of our undertaking which consists of an ESP32 microcontroller, sensors, motor, and fan. Sensors will collect the data and send it to the cloud. On the cloud, all the collected data will be monitored. That will be displayed on the farmer's web page.

Fig. 4. IoT based model

Fig. 5 contains the sensors generated data per interval of time. Data collected by the sensors will be available here. If the farmer wants to check facts in line with time, then he can.

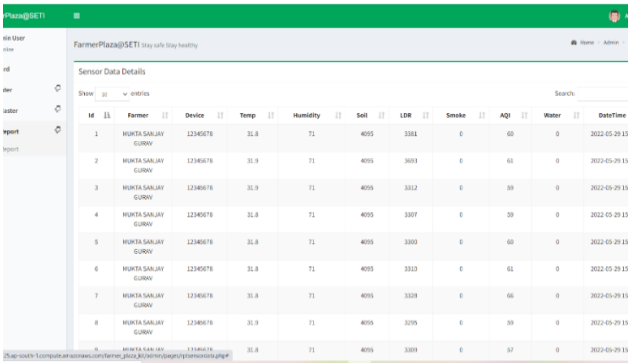

Fig. 5. Sensor's report

Fig. 6 contains the graph of data generated by sensors. All the users do not have that much time to watch the report and make conclusions. They will just see the graph and analyze the farm.

Fig. 6. Sensor's graph

6. Conclusion

By estimating the precision of the various calculations, in our project, we are going to see that by using this application the farmers can easily get the total benefit of the actual cost of the product that they sold. Also, all farmers are easily out of the darkness.

By using this application, they also get knowledge about how to operate the internet and how to use this type of facility. We will foster this application by including three kinds of fundamental dialects like Hindi, English, and Marathi. So, if a farmer doesn't know the other language, he can easily get the information by using these three languages that he knows. They also get knowledge about new government policies as early as possible.

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