A Survey on: Agriculture Management System Using Web Development with Machine Learning

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Abstract — Agriculture serves as the foundation of our nation, with a substantial percentage, ranging from 60-70%, relying directly or indirectly on it for sustenance in India. Being an agrarian-dependent country, India's progress is significantly intertwined with the agricultural sector. Despite its centrality, farming presents both advantages and drawbacks for Indian farmers. Our project endeavors to address these challenges by developing a web application that offers a reliable and beneficial platform for farmers to sell their produce. This initiative promises mutual profitability for both buyers and sellers. The application facilitates the online sale of pesticides and fertilizers, accompanied by instructional videos for the proper utilization of organic alternatives. Furthermore, the platform aids in the identification of plant diseases, offering remedies to minimize farm losses and enhance agricultural yields. Additionally, it serves as a unified platform for hiring farming workers, streamlining the labor procurement process for farmers.

Keywords - Agriculture, Worker, News, Image processing, Random Forests.

I.INTRODUCTION

Agriculture serves as the foundational pillar of our nation, sustaining the livelihoods of approximately 60-70% of the Indian population directly or indirectly. Given India's reliance on agriculture, it plays a pivotal role in the country's overall development. However, despite being the primary occupation for Indian farmers, it comes with both advantages and disadvantages. Farmers often allocate a significant portion of their funds to agriculture, yet the returns do not proportionately reflect their hard work, resulting in a financial imbalance. Our project aims to address these challenges through the development of a trustworthy web application, providing farmers with a beneficial platform for selling their produce. This initiative promises profitability for both buyers and sellers.

While the Indian Agriculture board offers alternatives to chemical fertilizers and pesticides, its outreach to farmers has not been entirely effective. In the era of digital development in India, a solution to this problem can be digitally provided. The online sale of organic pesticides and fertilizers, coupled with instructional videos on their proper usage, can revolutionize the farming landscape. Identifying and remedying plant diseases is crucial to curbing farm losses and increasing agricultural yields.

Every year, farmers endure substantial losses due to plant diseases and suboptimal crop choices. Identifying these diseases is not always possible with the naked eye, and consulting farm experts may not be feasible. The scarcity of agriculture workers poses a critical challenge to our food production system, impacting both the economy and the undervalued role of these essential workers. This shortage jeopardizes harvests and food supply, emphasizing the urgent need to address the underlying issues causing the labor shortfall. Creating a unified platform for both farmers and farming workers, where farmers can hire workers, is essential for bridging this gap and ensuring a resilient and sustainable agricultural future.

II.LITERATURE SURVEY

[1] Papaer Name: App Based Implementation of Modern Agriculture Utilities for Farmers

Author: "Dr. Neetu Mittal, Ankit Kumar, 2023 4th International Conference on Intelligent Engineering and Management (ICIEM), 979- 8-3503-4112-6/23©2023 IEEE"

Description: Contemporary agricultural applications hold promise in elevating crop yields, enhancing food security, and offering farmers more streamlined, cost-effective approaches to farm management. Nevertheless, the elevated expenses associated with adopting new technologies, coupled with the requisite specialized knowledge and training, can pose financial challenges for smaller-scale farmers. Additionally, the heightened

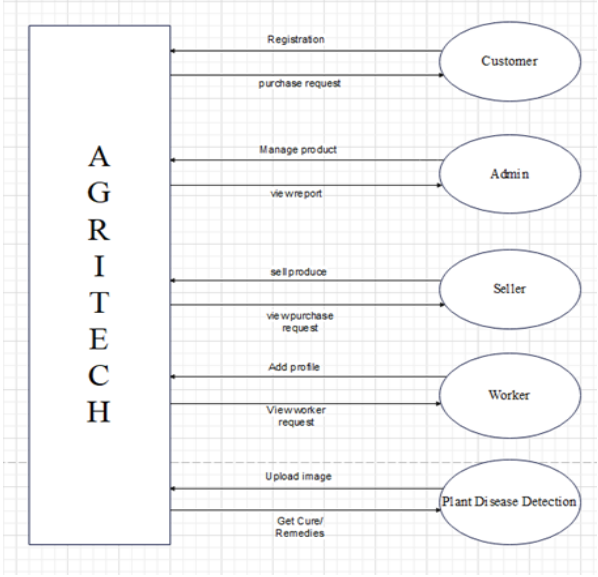
reliance on fertilizers and pesticides may lead to adverse environmental and health effects. This research delves into the implications of modern agricultural applications on farmers and introduces an innovative approach for farmers to engage in online transactions for the sale and purchase of their produce, without the involvement of intermediaries.

[2] Paper Name: Cloud Based E-Commerce Application for Organic Fertilizers, Pesticides And Other Products And Crop Disease Identification Using Computer Vision
Author: "Sowmyaa. V. R, Karthika. A, Shivani. B, T.Sheela, 2022 Inter- national Conference on Computer Communication and Informatics (ICCCI -2022), Jan. 25 – 27, 2022, Coimbatore, INDIA"
Description: Agriculture stands as the cornerstone of India's economy. Although the Indian Agriculture board offers various alternatives to discourage the reliance on chemical fertilizers and pesticides, its outreach to farmers has not been entirely effective. Given India's ongoing digital development, a digital solution to this challenge is viable. We propose the online sale of organic pesticides and fertilizers, accompanied by instructional videos providing guidelines on the proper utilization of these organic alternatives.

[3] Papaer Name: E-Commerce Site For Agriculture Products
Author: Megha Nayak, Pinky Wankhede, Neha Khapekar, Komal Dhote, International Research Journal of Engineering and Technology (IRJET), Volume: 06 Issue: 04 — Apr 2019
Description: E-commerce is undeniably making a significant impact on the agricultural sector, addressing concerns related to the traditional method of purchasing agricultural products. Customers often face challenges in obtaining quality agricultural products, requiring them to travel long distances. Our project is designed to alleviate these challenges by facilitating a computerized approach to buying and selling agricultural products nationwide, benefitting both farmers and customers. The website offers valuable guidance to farmers, enabling them to explore new farming techniques, compare current market rates for various products, track total sales, and calculate earned profits from sold items. By establishing a user-friendly platform, the website fosters direct communication between farmers and end-users, ensuring enhanced profitability. Serving as a secure avenue for agro-marketing, the website simplifies e-farming, allowing farmers to sell their products across the country with basic knowledge of website navigation. This project not only provides a comprehensive view of available products but also enables users to make instant purchases through online payment methods.

III. SYSTEM MODEL

Our mission is to furnish farmers, merchants, and farm laborers with cutting-edge technology and services, facilitating the expansion of their businesses and granting them access to a broader market. Through these means, we aim to enhance current farming processes and disseminate knowledge about contemporary agricultural issues. Our commitment extends to providing invaluable assistance to farmers and farm laborers in uplifting their livelihoods through the integration of technology, ultimately contributing to the improvement of the Agricultural Sector in the Indian Economy. We also prioritize the early detection of plant diseases, enabling farmers to take timely precautions and implement effective remedies to safeguard their crops.



IV. METHODOLOGIES

(A) Registration/Login: There is a separate registration for farmers and sellers. Authentication and sign in is provided to ensure security through a user friendly platform. Sellers must register themselves with relevant seller identification. Any user can register them as customer.
(B) Seller 's Market Place: The seller can upload the images of the products and demonstration video of

product usage with description for the product. These products are displayed at market place which customer can buy.

(C) Purchasing Products: The farmer can purchase the organic products by searching the product name, or by features or by sorting the price or by searching through location. Suggestions are also displayed based on the history of customers.

(D) Identifying Fertilizer and medicine for crop A separate module consists of web camera which allows to capture images of plants. The images are uploaded and using model, the disease is found. The medicines for disease is suggested to the user using collaborative filtering.

(E) Searching for nearest worker for farm and hire it.

(F) Datasets: To train the model for classifying the images, large amount of image dataset is required for disease classification. The dataset is collected from Plant Village website which contains healthy as well as affected plant dataset of different crops.

(G) Training Images: The images available in the dataset are reduced to similar and standard resolution for efficient training. The collected images are classified and labeled based on its properties. (H) Input image from User: Using the computer vision feature, user can give the image of the plant. thus image is reduced to required resolution.

(I) Image Preprocessing: The input image is processed using open computer vision and tensor flow. The unwanted noises including background of crop, reflection are removed and intensity is normalized for feature extraction.

(J) Feature Extraction: The pixels of the input crop image which are required for detection and identification are extracted. The values are feed to the trained model for comparison.

(K) Image Classification Using the features identification of affected crops from deep learning, the values extracted from input image are compared. Architecture consists of difference pooling layers which clustered images and identified parameters which is relevant to particular diseases. Based on the difference in parameters, the label consisting corresponding clustered image is returned as disease of given input image.

VI. CONCLUSION

In our endeavor, we have successfully digitized agricultural services and established a robust communication channel between workers and farmers. Addressing plant diseases is crucial in averting significant threats to food production and preventing further losses across entire fields. However, farmers often face challenges in differentiating between similar symptoms that may indicate different diseases. In conclusion, our efforts are dedicated to accurately identifying various diseases for effective mitigation.

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[3] Cloud Based E-Commerce Application For Organic Fertilizers, Pesticides And Other Products And Crop Disease Identification Using Computer Vision," Sowmyaa. V.R,Karthika.A,Shivani.B ,T.Sheela, 2022 International Conference on Computer Communication and Informatics (ICCCI -2022), Jan. 25 – 27, 2022, Coimbatore, INDIA"

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