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Online Farming Route System

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Abstract: ***The Online Farming Route System is designed to optimize the agricultural logistics and routing system, providing farmers and transporters with efficient routes for delivering farm produce to markets and processing centers. This system addresses critical issues in agricultural supply chains, such as inefficient route management, time delays, and increased costs due to poorly planned logistics. By incorporating advanced algorithms for route optimization and real-time data analytics, the system ensures that farm products reach their destinations in a timely and cost-effective manner. The system leverages geographic information system (GIS) technology to calculate optimal routes, taking into account factors such as road conditions, weather, traffic, and delivery time windows. The proposed system aims to support small-scale farmers and improve their market access, ensuring higher profitability and minimizing losses. The*** *Online Farming Route System* ***is a web-based application designed to empower farmers by providing personalized agricultural advice and management solutions. The system offers each farmer a unique profile, enabling tailored recommendations for crop care, disease diagnosis, and other vital farming operations. By integrating advanced algorithms and a user-friendly interface, the application helps farmers optimize crop management, improve productivity, and diagnose crop diseases with accuracy. Additionally, farmers can access customized solutions based on real-time data and expert inputs, making the app a valuable tool for enhancing decision-making processes in modern agriculture. The ultimate goal of the project is to improve agricultural efficiency, reduce crop losses due to diseases, and ensure farmers receive relevant, actionable advice to improve their yields and sustainability.***

Keywords: Route system, farming, crop, web based.

I. INTRODUCTION

Agriculture remains the backbone of many economies worldwide, providing food security, employment, and raw materials for various industries. However, inefficiencies in the agricultural supply chain, particularly in logistics and transportation, can lead to significant challenges for farmers and transporters. These challenges are especially pronounced in developing regions, where inadequate infrastructure, poor road conditions, and unpredictable weather patterns contribute to delays in delivering farm products to markets.

In many cases, small-scale farmers struggle to access urban markets, leading to reduced profitability and post-harvest losses. The transport of agricultural produce is often done without any systematic route planning, resulting in inefficient use of time and resources. Moreover, perishable goods such as fruits and vegetables are highly vulnerable to delays, leading to spoilage and economic losses.

To address these challenges, the Online Farming Route System aims to provide an innovative solution that optimizes route planning for farmers and transporters. By leveraging modern technologies such as GIS, machine learning, and real-time data analytics, this system will provide the most efficient routes based on current road conditions, traffic, and weather forecasts. The system will not only optimize the route but also prioritize perishable goods, ensuring that they reach the market before spoilage occurs.

Route optimization in logistics has been extensively studied in other industries, such as e-commerce and freight transportation, but its application in agriculture remains limited. This project seeks to fill that gap by developing a system specifically designed for the agricultural sector. By providing farmers with easy-to-use tools for planning and modifying routes, the system will empower them to make informed decisions that enhance the efficiency of their operations.

The introduction of this system is timely, as the global demand for food continues to rise, and the

need for efficient, sustainable agricultural practices becomes increasingly critical. According to the Food and Agriculture Organization (FAO), around 30% of global food production is lost due to inefficiencies in the supply chain, much of which occurs during transportation. By improving the logistics of agricultural transport, the Online Farming Route System has the potential to reduce food waste, improve farmers' income, and contribute to the overall sustainability of the agricultural sector.

This study will focus on the development and implementation of the system, using both algorithmic route optimization techniques and real-time data analytics. The system will be designed to accommodate the unique needs of different types of farms and products, ensuring that even small-scale farmers can benefit from its features. The ultimate goal is to create a scalable and sustainable solution that can be implemented in various agricultural regions, improving market access and reducing logistical inefficiencies.

In summary, the Online Farming Route System represents a novel approach to tackling the logistical challenges faced by farmers in delivering their products to markets. By combining modern technology with the specific needs of agriculture, the system aims to improve the overall efficiency of the agricultural supply chain, reduce post-harvest losses, and enhance the profitability of farmers. This project will significantly contribute to the growing body of research on sustainable agricultural practices and provide a practical tool for farmers worldwide.

II. LITEARTURE SURVEY

1. **Wolfert, S., Ge, L., Verdouw, C., & Bogaardt, M.-J. (2017).** This paper reviews the role of big data in smart farming and its potential impact on decision-making processes. It highlights how data-driven approaches can improve efficiency and sustainability in agriculture, focusing on the challenges of data integration, interoperability, and security in modern agricultural systems.
2. **Zhang, N., Wang, M., & Wang, N. (2002).** This article provides a global overview of precision agriculture, emphasizing the integration of information technology, control systems, and data collection tools. The review outlines key technologies such as GPS, GIS, and sensors, and discusses their application in enhancing agricultural productivity and sustainability.
3. **Food and Agriculture Organization of the United Nations (FAO) (2019).** The briefing paper discusses the application of digital technologies in agriculture and rural development. It highlights key technologies such as blockchain, IoT, and AI, providing insights into how these tools can promote sustainable agriculture, increase food security, and enhance rural livelihoods.
4. **Verdouw, C., Beulens, A., Wolfert, S., & Rialland, A. (2016).** This paper explores the virtualization of food supply chains through the Internet of Things (IoT). The study demonstrates how IoT can enable real-time visibility and control over agricultural processes, improving supply chain transparency and responsiveness to market demands.
5. **Jha, K., Doshi, A., Patel, P., & Shah, M. (2019).** This comprehensive review discusses the integration of artificial intelligence (AI) in agricultural automation. The paper analyzes various AI applications, including crop monitoring, disease detection, and autonomous machinery, offering insights into how AI can enhance decision-making and productivity in modern farming.
6. **Khanal, S., Karkee, M., & Steward, B. L. (2017).** This paper reviews emerging automation technologies in crop production, such as robotics, drones, and sensors. It evaluates the potential of these technologies to optimize crop management and improve productivity, while also considering the technical challenges of their adoption in agriculture.
7. **Liakos, K. G., Busato, P., Moshou, D., Pearson, S., & Bochtis, D. (2018).**

This review paper presents the role of machine learning (ML) in agriculture, discussing various algorithms used for data analysis in precision farming. The paper covers applications such as yield prediction, crop disease detection, and weed identification, showcasing the benefits of ML in enhancing agricultural practices.

8. **Aggarwal, C. C. (2015).** In this textbook chapter, the author discusses the role of data mining in precision agriculture. The chapter covers various data mining techniques, such as clustering and classification, and their application in crop management, soil analysis, and pest control, highlighting the potential of data-driven agriculture.

III. PROPOSED METHOD

The **Online Farming Route System** is a comprehensive web and mobile application designed to cater to the unique needs of farmers by providing them with real-time, personalized support. Its accessibility is a key feature, as it can be used from any location, allowing farmers to manage their crops and farming operations efficiently. The application offers a flexible platform for farmers, experts, and other agricultural stakeholders to interact and exchange knowledge. Through a user-friendly interface, the system ensures that all users, regardless of technical expertise, can easily navigate and use the application.

One of the core features of the platform is the ability for farmers to upload images of their crops or describe symptoms they observe. This input is analyzed either through an AI-driven process or through expert review, depending on the system design. The application provides a diagnosis based on the information provided and offers potential treatment options or solutions. This diagnostic capability allows farmers to quickly identify issues affecting their crops, such as pest infestations, diseases, or nutrient deficiencies. As a result, farmers can take timely action to prevent further damage and boost productivity, minimizing the negative impact on their crops.

Furthermore, the system is designed to assist farmers throughout various stages of the farming process. From crop planning and sowing to pest management and harvest optimization, the application offers tailored advice and support. The use of real-time data and expert input helps farmers make informed decisions, leading to more efficient resource use and higher crop yields. Additionally, the application integrates a community feature where farmers can share their experiences, success stories, and challenges, thereby creating a knowledge-sharing network that enhances collective learning.

Overall, this proposed method ensures a holistic approach to modern farming by combining technological advancements with practical farming expertise. The platform not only empowers farmers with the necessary tools to manage their crops but also fosters a collaborative environment for agricultural innovation. This comprehensive solution serves as a valuable tool in addressing the evolving challenges of agriculture, ensuring sustainability, and enhancing farm productivity across different farming operations.

- This is web and mobile application which is very flexible to use and can be accessed from anywhere.
- A platform where farmers can interact with peers and agricultural experts to resolve queries, enhancing the exchange of knowledge.
- Farmers can upload images or describe symptoms of their crops, and the app will provide potential diagnosis and treatment options. This feature helps farmers quickly identify and address issues affecting their crops.
- The application can be used in various farming operations, from crop planning to pest management, ensuring comprehensive support throughout the farming process.

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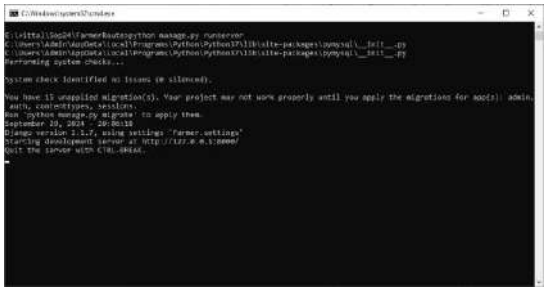
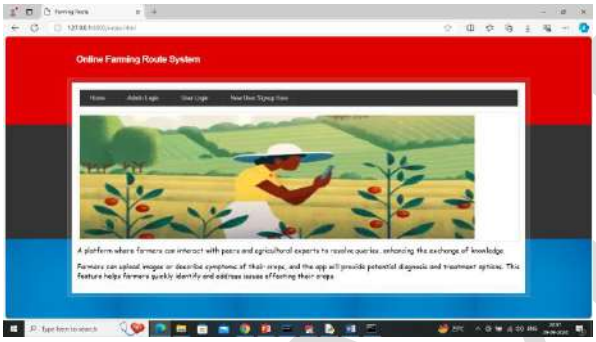
IV. RESULTS

Double click on 'run.bat' file to start python web server and then will get below page



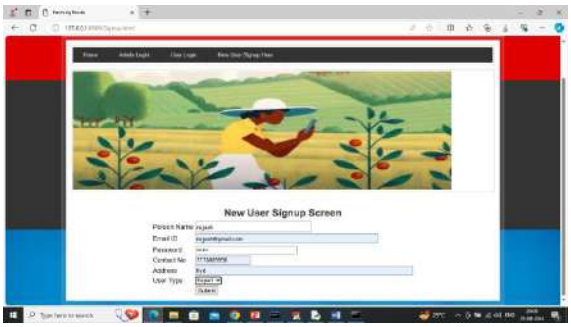
In above screen python server started and now open browser and enter URL as http://127.0.0.1:8000/index.html and press enter key to get below page



In above screen click on 'New User Sign up' link to get below page

In above screen farmer user is entering sign up details and then press button to get below page

In above screen Farmer sign up task completed and similarly sign up 'Expert user'



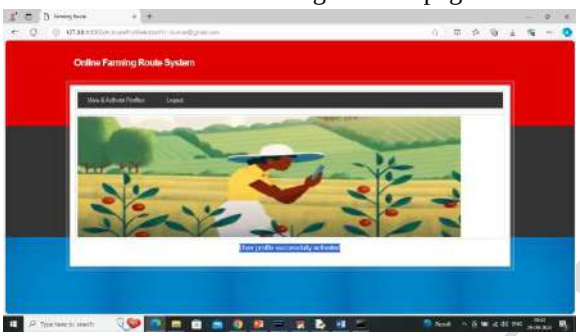
In above screen expert is entering sign up details and then press button to complete sign up task and then will get below page

In above screen sign up completed and now click on 'Admin Login' to login as admin and then can activate accounts.

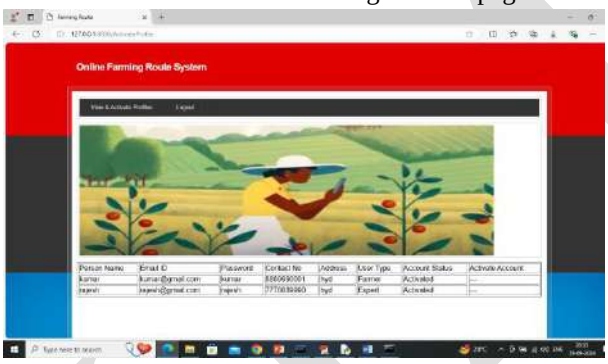
In above screen admin is login and after login will get below page

In above screen admin can click on 'View & Activate Profiles' link to view all accounts like below page

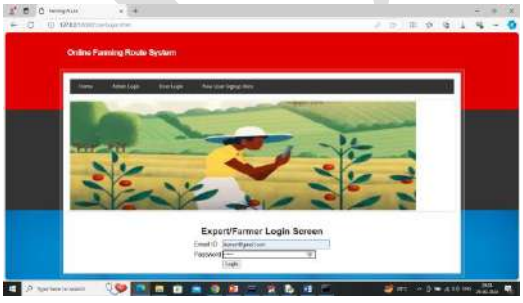
In above screen user profile is in pending state and now admin can click on 'Click Here to Activate' link to activate accounts and get below page



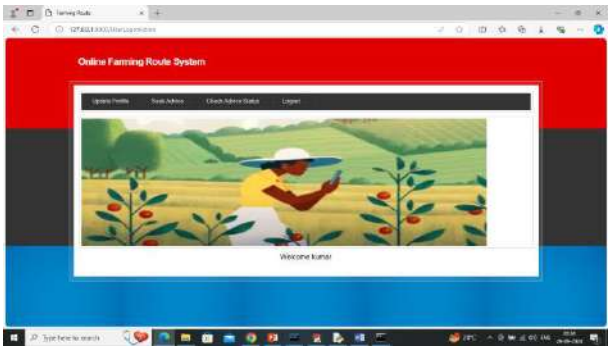
In above screen user profile is successfully activated and after activation will get below page



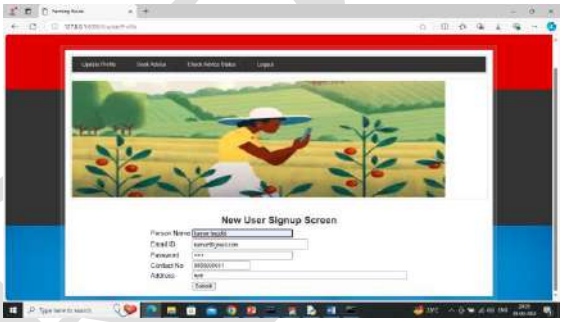
In above screen now both experts and user account is in active state and now logout and login as farmer



In above screen farmer is login and after login will get below page

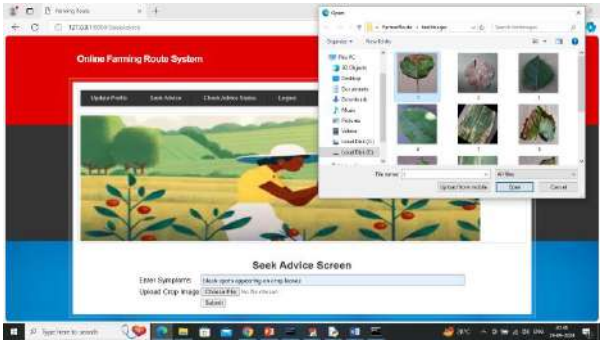


In above screen farmer can click on 'Update Profile' link to get below page



In above screen user can update desired details and then press button to get below page

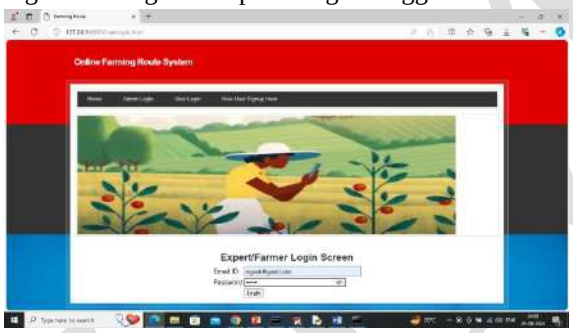
In above screen profile updated successfully and now click on 'Seek Advice' link to upload crop image to experts to seek advice



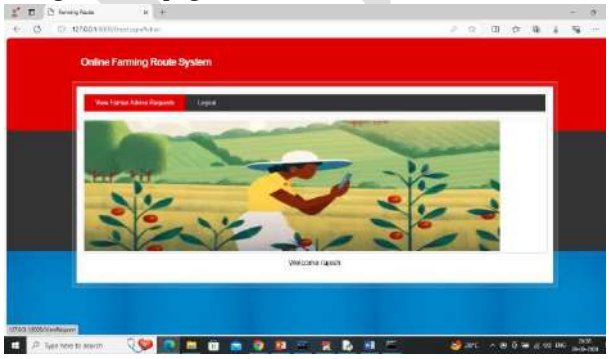
In above screen farmer entering symptoms and then uploading crop image and then click on 'Open' and 'Submit' button to get below page

In above screen farmer request forwarded to experts and now click on 'Check Advice Status Link' to get below page

In above screen farmer can see request is sent to expert but advice is in pending state and now logout and login as experts to give suggestion

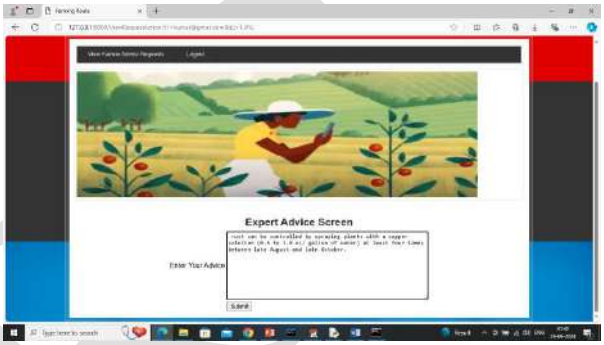


In above screen expert user is login and after login will get below page



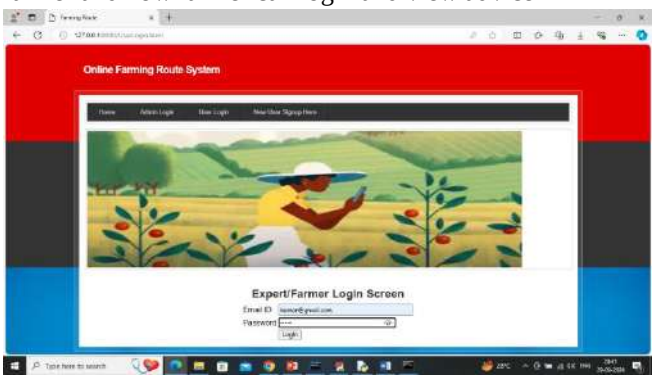
In above screen expert can click on 'View Farmer Advice Requests' link to view requests from farmers and get below page

In above screen expert will view all details and then click on 'Click Here to Advice' link to suggest advice to farmers and get below page



In above screen expert will write some advice and then press button to update advice and get below page

In above screen can see advice successfully sent to farmer and now farmer can login and view advice



In above screen farmer is login and after login will get below page

In above screen click on 'Check Advice Status' link to get below page

In above screen farmer can see advice given by experts.

Similarly by following above screens you can run all modules

V. CONCLUSION

The **Online Farming Route System** provides a comprehensive and user-centric solution for addressing the diverse needs of farmers. Through personalized profiles and tailored advice, the system enables farmers to make informed decisions regarding crop care and disease management, helping them improve productivity and sustainability. By offering real-time recommendations and accurate disease diagnosis, the application proves to be a valuable asset in modernizing agricultural practices. As the platform continues to evolve, integrating more advanced features and expanding its scope, it holds the potential to significantly impact farming outcomes and contribute to a more sustainable and efficient agricultural ecosystem

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