IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Techfarm: Your Personlized Farm Assistent

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Abstract: Agriculture acts as an important factor in ensuring food supply and pillar for economic development, but current farming method faces many challenges such as unpredictable weather, crop diseases, and insufficient access to equipment, and fluctuating market prices. These issues majorly affect the small and marginal farmers, resulting in reduced crop production and income. To overcome these issues, the system "TechFarm: Your Personalized Farm Assistant" provides a smart and user-friendly web-based digital platform that includes weather forecasting with alert advisory through the use of API's, crop planning and scheduling for crop, disease detection by image processing, equipment sharing services, and real -time market price update. The system uses trustworthy third party API's to provide accurate information.

Index Terms – TechFarm, Crop Disease Detection, Weather Forecasting, Equipment Sharing, Market Price Analysis, and Crop planning and scheduling.

I. INTRODUCTION

Farming is an important business in India many people depend on farming for their livelihood. But nowadays farmers have to face many problems. There are Weather changes affecting irrigation, and harvesting. Crop diseases and pest attacks also damage crops and reduce production. Many farmers cannot identify diseases early, which leads to heavy crop loss.
Instead of these problems, the problem is that modern farming machines are very costly. Small farmers cannot afford tractors, harvesters, and other equipment. Because of this, they depend on labor but labor costs are increasing and sometimes workers are not available. Farmers also face problems with market prices because crop prices change daily. Many farmers do not know the correct market price and sell their crops at low rates. To provide a solution for all these problems, the project "TechFarm: Your Personalized Farm Assistant" has been developed. TechFarm is a smart Farming system that provides farmers with real-time weather updates, crop planning support, disease detection using crop images, equipment sharing facility, and live market price information on one platform. Because this Project Farmer can take the right decision at the right time, reduce losses, save money, and increase profit. Overall, TechFarm supports farmers in adopting smart and modern farming practices.

II. LITERATURE REVIEW

Paper 1: Crop Disease Diagnosis through Image Reference and Symptom Matching (Published year: 2022)

A mobile agricultural support program that helps farmers detect crop diseases using symptom-based searches and visual comparison users have the option to upload or select a leaf image as well as select the crop after comparing this photograph with a reference database the application displays possible matches along with information on diseases their causes and recommended treatments to keep the system affordable and easy to use for farmers it prioritizes awareness and instruction over complex machine learning techniques.

Paper 2: A Mobile Application for Agricultural Disease Information and Management (Published year: 2021)

The goal of this project is to make an android mobile application that is easy to use for farmers information about major crop diseases their symptoms and treatment options is the primary goal of this app in the app farmers can choose the crop and disease types by hand the app will display information about appropriate fertilizers insecticides and preventative measures after you've made your selection with the aid of this application farmers may quickly detect and manage crop illnesses without the need for sophisticated sensors or machine learning methods.

Paper 3: Smart Agriculture Information System for Farmers Using Mobile Application (Published year: 2020)

This abstract shows an android-based agricultural asking system which gives data on fertilizers weather diseases and crops when selecting a crop farmers may learn about diseases by looking for obvious indications like spots or color changes on the leaves like a digital guide the system offers information on how to avoid and manage crop diseases it is created using a basic image and text database no machine learning nor automatic predictions are used.

Paper 4: Web GIS Based Decision Support System for Agriculture Monitoring and Management (Published year: 2025)

The farm management and control system AMMS(Agriculture Monitoring and Management System) a web geographic information systems GIS system for Punjab India's main crops is the subject of this study's analysis of its design and execution to manage geographic data it combines free software such as apache server geographic server and others open layers postgis and postgresql users can see seasonal and annual changes in crop types farming areas and weather features collected from space imagery thanks to the systems dynamic display looking into weather parts storage places and regional variations is made simple for people who are interested by giving information on the area planted for different crops and farming conditions the instrument helps users in making decisions by helping them in crop planning and resource allocation.

Paper 5: Automation of Krishi Market System and Real Time Price Display System (Published year: 2023)

This project are developed to show the real time market price.

The main aim of this project is to show the live market prices. Those Prices are gained by the Farmers, Middle man and Government Offices. After that this system analyze the information and give Fluctuated updates of the product prices.

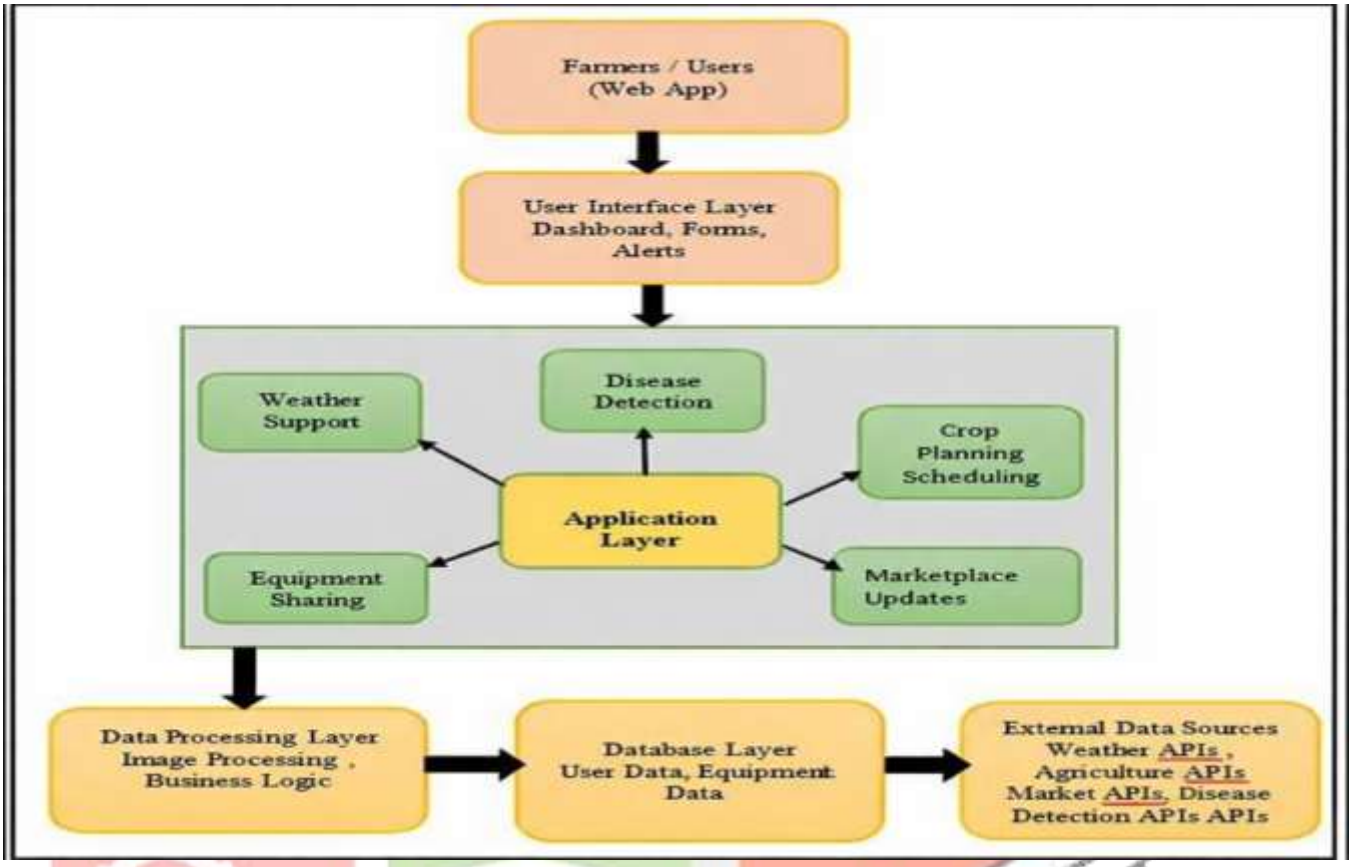
The system shows the rates in the form of chart and graphs which will be easy to understand the users of the system. With the help of this system Farmer can gain correct Information and make better decision for the sale the product and farmers can earn more profit.

Paper 6: Dynamic Scheduling Strategy for Shared Agricultural Machinery for On-

Demand Farming Services (Published year: 2022)

The use of this project is to share farm equipment online like tractor, harvesters ,etc. In this they are studied about the weather soil type and type of crop because on the basis of this decided when and where to use which equipment after that they developed a mathematical algorithm which will be help to decide when and where to send the equipment

III. BLOCK DIAGRAM



IV. PROPOSED SYSTEM

The proposed system is a smart farming web application developed for agricultural support. The existing farming system depends on traditional methods, manual monitoring, and limited access to real-time farming information. Farmers usually face problems such as late disease detection, unpredictable weather forecasts, inefficient crop planning and difficulty in getting updated market prices and unaffordability of the costly equipment. The proposed system overcomes these disadvantages by providing an integrated platform that helps farmers in making better decisions, reducing manual efforts, improving accuracy, and saving time. The system provides support through features such as weather based decision that provide weather forecasts and alerts, crop planning and scheduling a suitable schedule for crop with harvesting, cultivation, fertilizing dates, crop disease identification by image processing of the image uploaded by the users, market price updates provided with the help of external APIs and provides equipment sharing support as well for the farmers who cannot afford the costly equipment's such and fertilizer tool, harvesting machine, tractors etc., this is the platform where farmers can rent and borrow the equipment's. All the required data is stored and managed efficiently using a database.

V. RESULT AND APPLICATION

1. RESULT

The implementation of TechFarm proves that a single digital platform can help farmers manage their work more effectively. The system was tested using its main features such as weather updates, crop planning, disease support, equipment booking, and market prices. Weather alerts helped farmers decide the right time for irrigation and fertilizer use. The crop planning module suggested suitable crops and

provided a clear schedule based on the season. Farmers could upload images of crops to check for diseases and receive treatment advice. Quick guidance helped them take action early and avoid extra use of chemicals. The equipment booking feature made it easy to search and reserve machinery. This reduced costs and helped small farmers get access to important tools. The market price module showed the latest rates, which helped farmers choose the best time and place to sell. Having all services in one dashboard reduced confusion and dependency on others. Overall, TechFarm improved knowledge, saved time, used resources better, and supported better income planning.

2. APPLICATION

TechFarm supports farmers in their everyday farming tasks. It helps them choose the right crops according to the season and local conditions. Weather information from the system guides farmers in planning irrigation and fertilizer use. Farmers can submit images of their crops to learn about possible diseases and receive advice on treatment and prevention.

The platform also makes it easier for farmer groups to share and manage agricultural machinery. This improves access to equipment, especially for small and medium farmers, and reduces expenses. By providing updated market prices, TechFarm helps users decide the proper time and place to sell their product.

VI. CONCLUSION AND FUTURE SCOPE

1. CONCLUSION

Techfarm is a simple and user-friendly system designed for farmers it makes their daily farming work easier many farmers do not receive correct and timely information about weather crop schedules real-time market prices crop diseases and equipment orders because of this lack of information crop production can be affected and farmers income may decrease this platform provides all farming-related information in one place farmers can check daily weather reports and receive early warnings about storms heavy rain or very hot weather this helps them protect their farms in advance TechFarm also helps farmers choose the right crops it gives information about the best time for planting and harvesting farmers can upload photos of their crops in the system and it can detect crop diseases at an early stage this helps prevent major losses and reduces the need for excessive chemical treatments the equipment-sharing option provides access to farming tools in one place which reduces costs in addition the platform displays real-time market prices this helps farmers decide the best time to sell their crops and earn more profit testing shows that the system is easy to use and understand it saves time reduces expenses and supports better farming practices overall TechFarm makes farming simpler and helps farmers increase their income through clear and useful guidance.

2. FUTURE SCOPE

The current system already helps farmers in many ways but it can be improved in the future small devices can be added in the fields to automatically collect information like soil moisture temperature humidity and soil nutrients this will help the system give better advice about which crops to grow and when to water them smart computer programs can be added to improve plant disease checking estimate how much crop will be produced and give better crop planning advice as the system learns from more farming data it can give better suggestions for different areas and different crops the system can also support different regional languages and allow farmers to use voice commands this will make it easier for farmers who cannot read well or are not comfortable using technology automatic watering and fertilizer systems can be connected to make better use of water and nutrients this will reduce waste and help crops grow healthier the platform can also be linked with government farming schemes subsidies crop insurance and advisory services making it more helpful and widely used in the future TechFarm can grow into a complete smart farming system that supports large farms farmer groups and rural development programs with regular improvements and new ideas the system can help change traditional farming into a more modern sustainable and profitable way of farming.

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VIII. ACKNOWLEDGEMENT

It is with profound sense of gratitude that I acknowledge the constant help and encouragement from our Project guide & Mentor Prof. Ghalame. S. S, Head of Computer department prof. Ghalame. S. S, hon. Principal Dr. Kanase. A.B. and whole hearted thanks to my family. This is to acknowledge and thanks to all individuals who played defining role in creating this work.

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