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Integrated Online Platform for Agricultural Products and Information

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Abstract: ***Agriculture is the basic and most important profession of our country as it balances the food requirement and also the essential raw materials for several industries. The implementation of smart technology in agriculture practices needs to be focused on for better land productivity. Internet of Things technology has brought a revolution to each and every field of common man's life by making everything smart and intelligent. The development of Intelligent Smart Farming based on IoT is day by day turning the face of agriculture production by not only enhancing it but also making it cost-effective and reducing wastage. The aim of this project is to propose a Novel Smart Interactive Platform for Integrated Information of Agricultural Products based Agriculture system that can assist farmers in crop management by getting Live Data (Temperature, Humidity, RainFall, Soil moisture content) for efficient environment monitoring which will enable smart farming and increase their overall yield and quality of products. This system proposes an interactive platform for integrated information of agricultural products which combines farm production, supply and marketing of agricultural products. This will help the information platform to play the role of information collection and distribution, and to improve the efficiency of the circulation of agricultural products.***

Keywords: Agricultural Information, Agricultural Products, Weather Forecast, E-Commerce.

I. INTRODUCTION

As the economy develops, people's demand for food is getting higher and higher. Therefore, the control of agricultural products has become more and more important. The agricultural sector not only needs traditional agricultural production experience and theory but also needs to use modern science and technology and management methods to serve it, and promote the continuous improvement of agricultural productivity, with a view of improving the quality and output of agricultural products. After entering the 21st century, various data explosions have occurred due to the continuous development of Internet technology, cloud computing technology, and sensing technology; and these huge amounts of data can be stored, analyzed, and utilized on the basis of storage technology and cloud computing technology.

As a result, to the development of the agricultural sector many other sectors started working for the betterment of it. The Information technology worked in many ways for the agricultural sector some of the roles include Improved productivity, Community involvement, Good post-Harvest practices and Value addition of farm produce, Improved decision making by the farmer, Improved efficiency and service delivery at the farm, Weather forecasting and climate smart farming, Market Monitor Considering the work done by the IT sector for the betterment of the agricultural sector ,this project proposes a platform where information technology and modern age shopping(e-commerce) are integrated together to make farming a bit easier and convenient for the most hardworking part of our society.

II. PROBLEM DEFINITION

Data mining as well as informatics is an emerging field of research in Information Technology as well as in agriculture. Agrarian sector in India is facing a rigorous problem to maximize crop productivity. The present study focuses on the applications of data mining techniques in yield prediction in the face of climatic change to help the farmer in taking decisions for farming and achieving the expected economic return. The problem of yield prediction and as per productivity market is a major problem that can be solved based on available data. The gap between modern age markets(e-commerce) and agriculture can be bridged, also working on the smart agricultural techniques related to weather forecast. As a solution to such issues we proposed a system “Integrated online platform for agricultural products and information”, so in that we proposed both problems solution that is first E-Commerce of agriculture products and agriculture crop disease fertilizers & pesticides and second is Informatics about weather information, crop information, etc.

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III. METHODOLOGIES OF PROBLEM SOLVING

A. Requirement Gathering and Analysis

In this step of waterfall, we identify what various requirements are needed for our project such as software and hardware required, database, and interfaces.

B. System Design

In this system design phase we design the system which is easily understood for the end user i.e. user friendly. We design some UML diagrams and data flow diagrams to understand the system flow and system module and sequence of execution.

C. Implementation

In the implementation phase of our project, we have implemented various modules required to successfully get expected outcome at the different module levels. With inputs from system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality which is referred to as Unit Testing.

D. Testing

The different test cases are performed to test whether the project modules are giving expected outcome in assumed time. All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.

E. Deployment of System

The different test cases are performed to test whether the project modules are giving expected outcome in assumed time. All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.

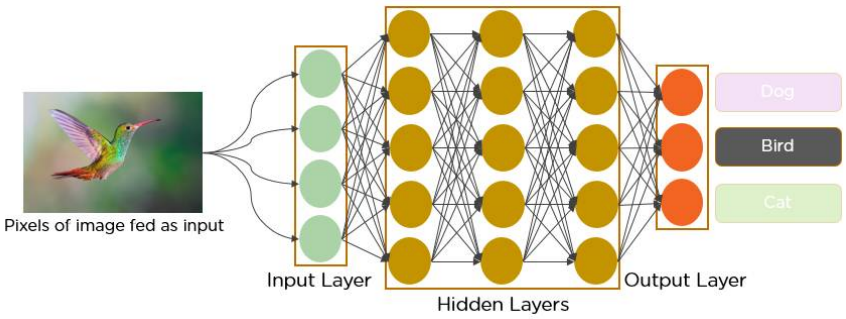
F. Maintenance

There are some issues which come up in the client environment. To fix those issues patches are released. Also, to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment. All these phases are cascaded to each other in which progress is seen as flowing steadily downwards like a waterfall through the phases. The next phase is started only after the defined set of goals are achieved for the previous phase and it is signed off, so the name "Waterfall Model". In this model phases do not overlap.

IV. ALGORITHM

A. CNN

In the past few decades, Deep Learning has proved to be a very powerful tool because of its ability to handle large amounts of data. The interest to use hidden layers has surpassed traditional techniques, especially in pattern recognition. One of the most popular deep neural networks is Convolutional Neural Networks.



At the heart of AlexNet was Convolutional Neural Networks a special type of neural network that roughly imitates human vision. Over the years CNNs have become a very important part of many Computer Vision applications and hence a part of any computer vision course online. So, let's take a look at the workings of CNNs.

V. SYSTEM ARCHITECTURE

To study crop recommendation fertilization as per the weather condition of the rural farmers as the main in our country, the system took towns and villages of India County as the study area, took recommendation fertilization of wheat, maize and peanut as the study object, designed model components of crop balance fertilization by using Object-Oriented technique, and developed the decision-making system about crop recommendation fertilization based on ArcGIS Server at village scale. The decision-making system realized farmland nutrient management and fertilization recommendations decision-making according to soil output capacity, agricultural production level and crop target yield. It was successfully applied in crop production in India Country.

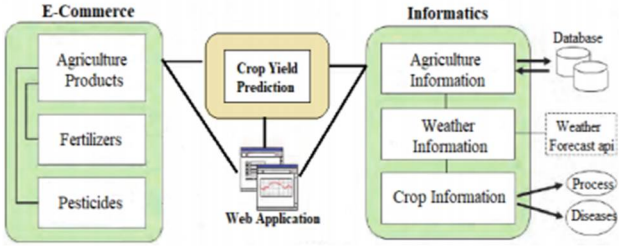


Fig 1: System Architecture

The research results show that the system has the characteristic of being better expansible than before, and it is significantly simple and practical to reduce crop production cost and increase agricultural production efficiency, which provides technical support for crop fertilization decision-making and is significant to improve agricultural ecological environment and increase the comprehensive production capacity of farmland.

The proposed system developed as per the recommendation of crop as per area, suggestion crop with cultivation process prediction of crop disease and its process as well as fertilizers and prediction and this system also recommends the nearby fertilizer shop and agro-equipment. One of the most important tasks in agriculture is to turn the soil and loosen it. This allows the roots to penetrate deep into the crop recommendation system. These organisms are friends of the farmer since they further turn and loose the soil and add humus to it. Here we are using sensors/api values like soil moisture sensor, temp sensor, humidity. In this work the experiments are performed two important and well known classification algorithms K Nearest Neighbor (kNN) and Density based clustering are applied to the dataset. Their accuracy is obtained by evaluating the datasets. Each algorithm has been run over the training dataset and their performance in terms of accuracy is evaluated along with the prediction done in the testing dataset.

VI. CONCLUSION

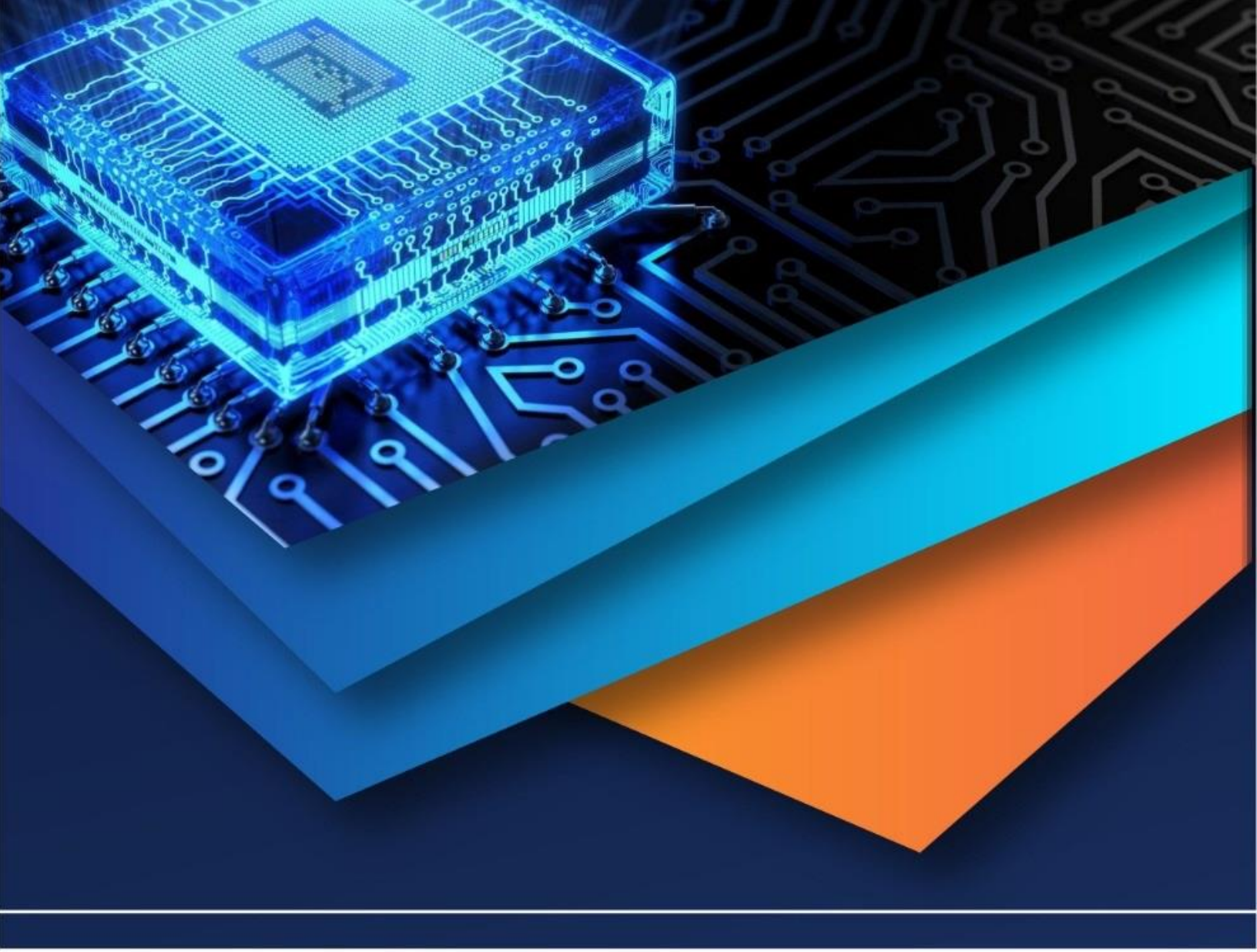
This system first analyzes Agriculture E-Commerce data. Then, an agricultural ECommerce platform based on data mining technology was established. Three modules were designed in the overall architecture: E-Commerce module, Informatics module, and data acquisition module by administration. Data such as soil moisture content, temperature and humidity, light intensity, crop growth status, and weather factors were obtained from the farmland. The data are then transmitted to the server through the agriculture department and the 3G network, and the data are directly imported into the neural network model for processing the data through the Web Service. Finally, by comparing the prediction results with the actual data, it is found that the prediction error of the model designed in this system is within 1% and the agricultural data are highly predictable, which helps efficiently in agricultural production and to help farmers for better productivity cost. In the existing information platforms of Indian agricultural products have shortcomings, so, this article attempts to build an interactive platform for integrated information of agricultural products in India to satisfy the demand for information of each node on the chain of the farm production, supply and marketing the Indian agricultural products, to achieve the purpose of information sharing, thereby to reduce the transaction costs, to promote the circulation of agricultural products, to decrease the risk, and to increase the income of farmers and enterprises. It can also help the government to regulate the agricultural products market effectively, and to maintain the order of the agricultural products market.

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