# Literature Review on Web application to help farmers find and buy supplies at the best prices.


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## 1 Paper 1: Krishi Portal: Web Based Farmer Help Assistance

**Journal/Conference Rank:** N/A
**Publication Year:** 2020
**Reference:** [1]

### 1.1 Summary


The paper discusses a web-based farmer assistance application named "Krishi Portal." This application leverages Information and Communication Technologies (ICTs) to provide various services and information to farmers. It includes information related to crops, diseases, prices, government schemes, weather forecasting, e-commerce, and agricultural machinery. The "Krishi Portal" also introduces an e-commerce platform for buying and selling agricultural products and machinery at competitive prices. The system is designed to be user-friendly, accessible, and beneficial for farmers and stakeholders in the agricultural sector.


### 1.2 Software Architecture

The system proposed in this paper aims to simplify and benefit the farming field from a farmer's perspective. It utilizes technologies such as HTML5, CSS3, JavaScript, Bootstrap 4.0, Java, and MySQL as the database. In addition, tools like XAMPP and Tomcat Server 8.0 are employed. This system serves both as a website and a mobile application. Farmers can access the system conveniently by visiting the website's URL or using the mobile application. Initially, users receive farming-related information. If farmers wish to sell or buy agricultural products or machinery, they must go through a registration and login process. Registration and login are mandatory for both selling and buying activities.

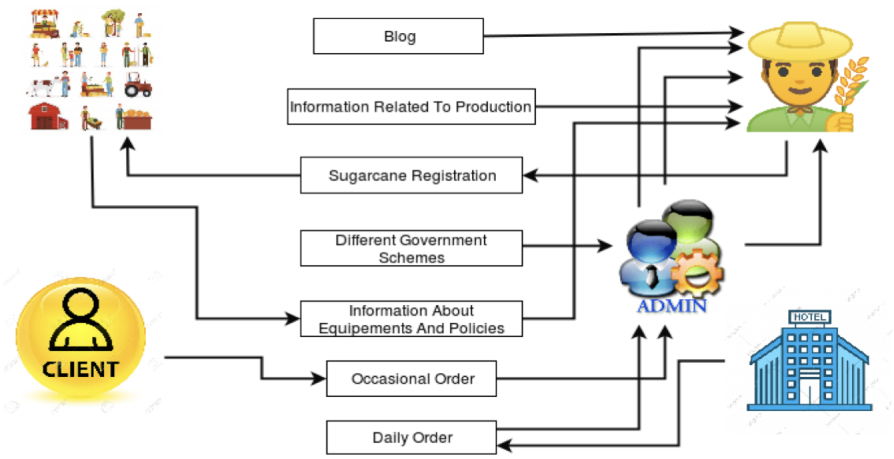



**Figure 1**: Architecture Diagram of Krishi-Portal

Figure 1:

## 1.3 Data Parameters

The paper uses various types of data parameters, including:

- Crop Name: The name of the crop the farmer wants to know about.
- Crop Season: The name of the season in which the crop is grown (Kharif, Rabi, Zaid).
- Crop Variety: The name of the variety of the crop (hybrid, improved, local, etc.).
- Crop Disease: The name of the disease affecting the crop.
- Government Scheme: The name of the government scheme that provides support or subsidies to farmers for growing a specific crop.
- Weather Forecast: The name of the weather forecast for the following seven days for the given location.
- Weather Parameters: The title of the weather parameters displayed in the forecast.
- Product Name: The title of the product the farmer wants to buy or sell on an e-commerce platform.
- Product Category: The title of the category of the product (Seed, fertilizer, pesticides, machinery, etc.).
- Product Description: The title of the description of the product, including specifications and quality.
- Datasets Used

- Crops Dataset

  This dataset contains information about various crops grown in India, including details such as name, type, season, variety, diseases, symptoms, control measures, rates, and government plans. It is important because it provides farmers with comprehensive and reliable information about their crops and farming practices.

- Weather Dataset

  This dataset contains weather forecast information for various locations in India over a seven-day period. It is essential for helping farmers plan their farming activities based on weather conditions and mitigate risks associated with adverse weather events.

- E-commerce Dataset

  This dataset contains information about various agriculture-related products available for sale or purchase on the e-commerce platform. It plays a vital role in helping farmers sell their products or acquire agricultural inputs at competitive prices while expanding their market reach.

### 1.3.1 Paper Link

Access the full paper at https://www.researchgate.net/profile/Vijay-Kumar-Sharma-2/publication/3479
$Portal - Web - Based - Farmer - Help - Assistance.pdf$.

# 2 Paper 2: Farming assistance web service

**Journal/Conference Rank:** N/A
**Publication Year:** 2020
**Reference:** [2]

## 2.1 Summary

The article proposes an agricultural application to directly connect farmers with customers, eliminating middlemen and enabling direct transactions. The motivation behind this initiative arises from the challenges farmers face in achieving fair profits due to the involvement of intermediaries.

The literature review delves into various aspects of agricultural supply chains and underscores the pressing need for direct market opportunities between farmers and consumers.

The proposed work outlines the development of an electronic agricultural application with dedicated sections for farmers, agents, and customers. It integrates features such as weather forecasts to enhance its functionality.

Scenarios and methods are described to delineate the application's functionality for different user roles. The future scope of this application includes language options and the incorporation of advanced user-friendly features.

## 2.2 Software Architecture

They have developed a farming application that meets all the needs of farmers and provides solutions. The application includes various sections, such as a login for farmers and the general public. According to the requirements, the application will be accessible via the web.

In the following section, a web console is introduced. Government agencies and banking commissions will connect through this console to provide essential data and information.

Additionally, the app includes a weather forecasting feature to help farmers stay informed, predict outcomes, and plan their work based on weather reports. The primary goal is to assist farmers in overcoming challenges by providing a user-friendly application.

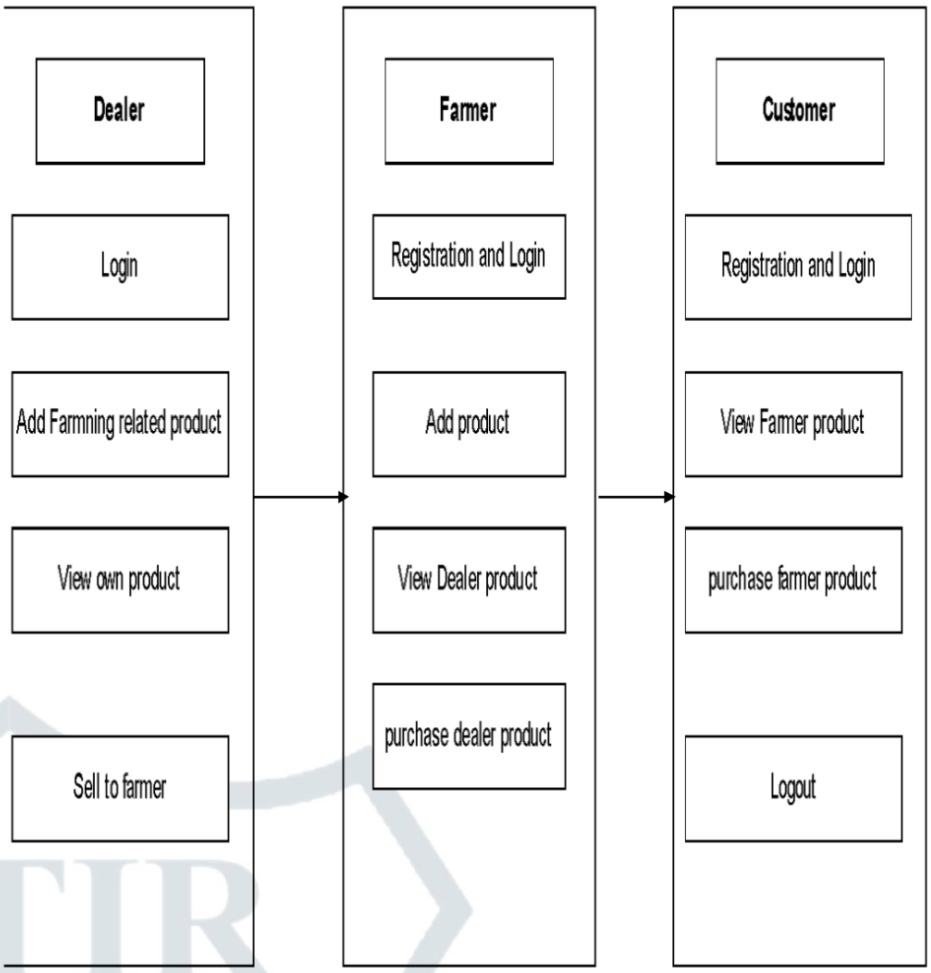



*Fig1: Architecture Diagram*

Figure 2:

## 2.3 Data Parameters

The data parameters include the following:

- Farmer Name: The name of the farmer who is using the system.
- Farmer Contact: The contact details of the farmer, such as phone number, email address, etc.
- Supplier Name: The name of the supplier who is offering products or services to the farmers.
- Supplier Contact: The contact details of the supplier, such as phone number, email address, etc.
- Product Name: The name of the product that the farmer or supplier wants to sell or buy on the e-commerce platform.
- Product Category: The category of the product, such as seeds, fertilizers, pesticides, machinery, etc.
- Product Description: The description of the product, including features, specifications, quality, etc.
- Product Image: An image of the product that shows its appearance or condition.
- Customer Name: The name of the customer who is interested in buying products from the farmers or suppliers.
- Customer Location: The location of the customer, including city name, state name, country name, etc.
- Complaint ID: A unique identifier for each complaint posted by the farmers on the system.
- Complaint Description: A detailed description of the complaint that explains the issue or problem faced by the farmer, along with any relevant information or evidence.

## 2.4 Datasets Used

The paper describes the datasets used in the system and their significance as follows:

**Crop Dataset:** This dataset contains information about various crops grown in India, including their names, types, seasons, varieties, diseases, symptoms, control measures, rates, and government schemes. This dataset is significant because it helps farmers obtain comprehensive and reliable information about crops and their cultivation practices.

**Weather Dataset:** This dataset contains information about weather forecasts for different locations in India over a seven-day period. It is significant because it enables farmers to plan their farming activities based on weather conditions and mitigate risks associated with adverse weather events.

### 2.4.1 Paper Link

Access the full paper at https://www.researchgate.net/profile/Hemlata-Ohal/publication/369113285_Fa
paper/links/640a1ab566f8522c3890743a/FarmingAss − paper.pdf.

# 3 Paper 3: Agriculture Supply Chain Management Based Android Application

**Journal/Conference Rank:** N/A
**Publication Year:** 2015
**Reference:** [3]

## 3.1 Summary

The paper presents a web-based system called "Agriculture Supply Chain Management Based Android Application." It provides a platform for farmers, suppliers, and customers to interact and exchange information and products related to agriculture. The system offers features like a budget calculator, schedule calculator, reports, and feedback to help farmers manage their expenses and profits. The paper claims that the system can enhance farmers' productivity and crop quality while reducing intermediaries and transportation costs in the agricultural supply chain.

## 3.2 Software Architecture

The application is built on the Android platform, which supports mobile maps and linking multiple websites. It consists of three main modules: Information System, Budget Calculator, and Reports. The software architecture involves Android application development, utilizing Java and C++ for Android development, and potentially integrating other relevant technologies for database management and user interface.

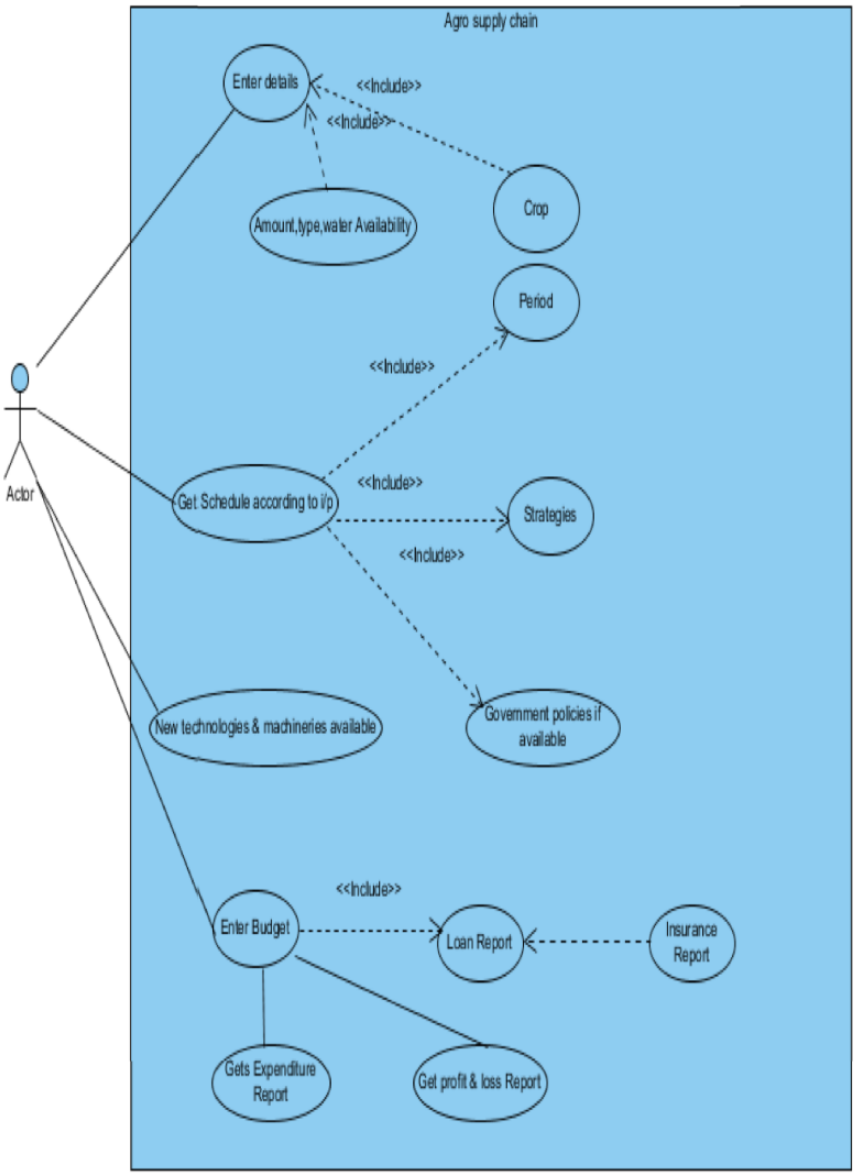



Figure 3:

## 3.3 Data Parameters

Data parameters in the paper include information about farmers (e.g., names, contact details), suppliers (e.g., names, contact details), products (e.g., name, category, description), customers (e.g., names, locations), and complaints (e.g., complaint ID, description). These parameters are crucial for managing the agricultural supply chain and facilitating communication between stakeholders.

## 3.4 Datasets Used

The paper does not explicitly mention specific datasets. However, it outlines data parameters used in the application, which are likely derived from real-time inputs provided by users.

### 3.4.1 Paper Link

Access the full paper at

# 4 Paper 4: IoT with Blockchain: A Futuristic Approach in Agriculture and Food Supply Chain

**Journal/Conference Rank:** N/A
**Publication Year:** 2022
**Reference:** [4]

## 4.1 Summary

The paper presents a cutting-edge approach by integrating IoT (Internet of Things) and Blockchain technologies to revolutionize the Agriculture and Food Supply Chain. It aims to create a futuristic system where IoT devices collect real-time data on crucial agricultural parameters, and this data is securely recorded on a Blockchain. This innovative integration promises to tackle supply chain challenges, ensuring traceability, security, and overall efficiency in the agricultural sector. The aim is to address challenges in the supply chain, ensuring traceability, security, and overall efficiency.

## 4.2 Software Architecture

The software architecture is a synergistic blend of IoT and Blockchain technologies. IoT devices, strategically placed in agricultural settings, continuously collect data on key parameters such as temperature, humidity, and soil conditions. This real-time information is then securely transmitted to a Blockchain network. The decentralized and immutable nature of Blockchain ensures the integrity and transparency of the recorded agricultural data, providing a robust foundation for a trustworthy supply chain.

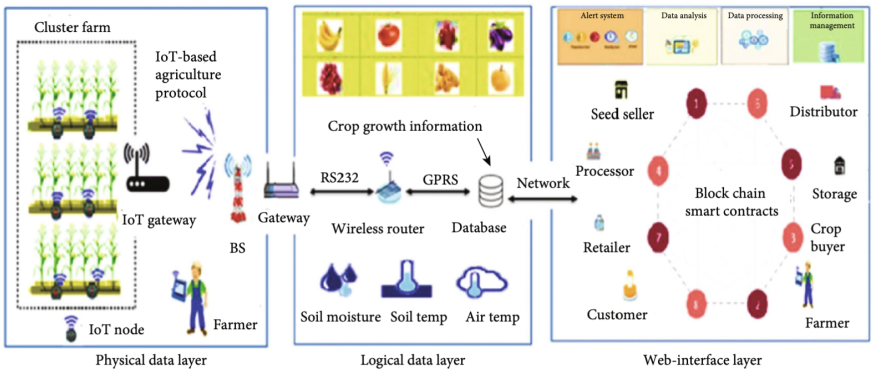



Figure 4: Software architecture diagram for Paper 4.

## 4.3 Data Parameters

The data parameters comprise a rich set of real-time information gathered by IoT devices. This includes environmental factors influencing crop growth and health. Additionally, the

system records transactional data critical to the supply chain, such as the movement of agricultural products, storage conditions, and quality assessments. These parameters are likely secured using cryptographic methods to maintain the integrity and confidentiality of the data.

## 4.4 Datasets Used

The datasets utilized in the study consist of real-time sensor data obtained from IoT devices strategically placed in agricultural landscapes. These datasets play a pivotal role in monitoring and optimizing various agricultural processes. On the Blockchain side, the datasets include a comprehensive transactional history of agricultural products. This history, stored in an unalterable and decentralized manner, ensures transparency and trustworthiness in the supply chain. The significance lies in establishing a credible and transparent system for all stakeholders involved in the agriculture and food supply chain.

### 4.4.1 Paper Link

Access the full paper at https://www.hindawi.com/journals/wcmc/2021/5580179/.

# 5 Paper 5: Implementing E-Commerce Mobile and Web Application for Agricultural Products: e-Farmers' Hut

**Journal/Conference Rank:** N/A
**Publication Year:** 2021
**Reference:** [5]

## 5.1 Summary

The paper presents an e-commerce mobile and web application called 'e-Farmers' Hut' that aims to facilitate direct producer-to-customer engagement for agricultural products in Bangladesh. The paper describes the problem of price inflation and exploitation of farmers by middlemen in the agricultural market, and proposes a solution that eliminates the intermediaries and connects the farmers and consumers directly. The paper also introduces an electronic payment method to optimize the use of facilities. The paper reports the results of testing the application and claims that it has the potential to simplify and improve the sales and purchases of agricultural products.

## 5.2 Software Architecture

The software architecture of "e-Farmers' Hut" is centered around E-Commerce principles. It employs a client-server model where users (farmers and consumers) interact with the application through mobile and web interfaces. The server-side involves a robust backend that manages the application's database, user authentication, and business logic. The frontend, accessible through both mobile and web applications, provides an intuitive and seamless experience for users to showcase, sell, and purchase agricultural products.

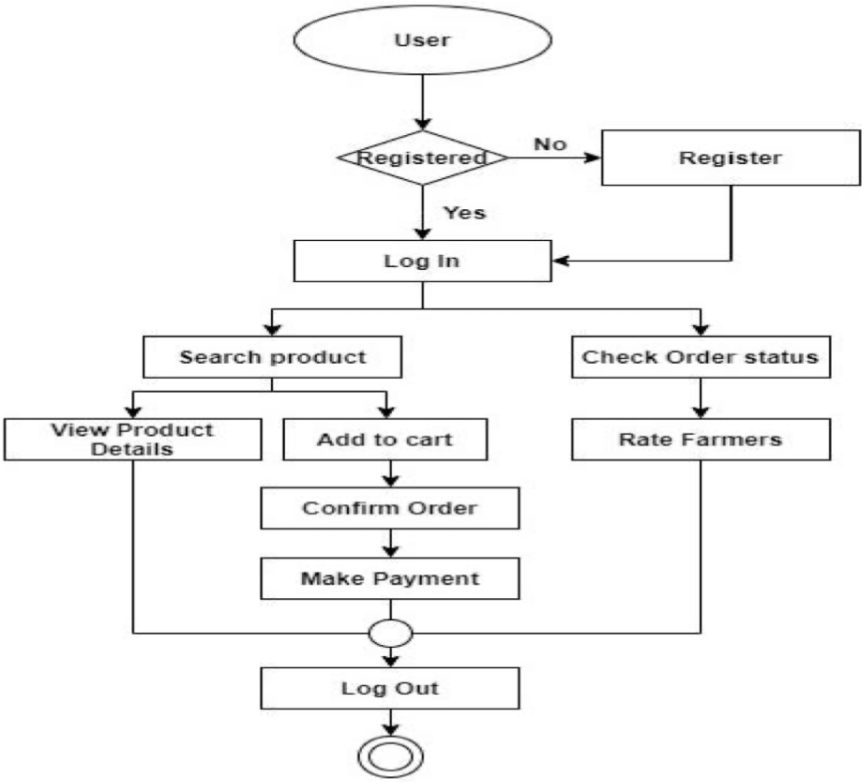



Figure 5:

## 5.3 Data Parameters

The data parameters used here are:

- User Data: Contains details about farmers and customers, such as names, addresses, and login information.
- Product Data: Consists of information on agricultural items, such as names, descriptions, costs, and pictures.
- Transaction Data: Maintains transparency and accountability by documenting the specifics of transactions between farmers and customers.
- Authentication information controls user access, protecting the platform from unwanted use.
- Reviews and Feedback: Enables users to offer reviews and feedback, establishing a reputation system on the platform.

## 5.4 Datasets Used

The datasets included in the paper comprise hypothetical or actual information important to the operation of "e-Farmers' Hut." These datasets include:

- User Datasets: To evaluate user sign-up, authentication, and application interaction.

- Product Datasets: To highlight the breadth of goods offered on the site, include a range of agricultural products.
- Transaction Datasets: Simulating user transactions to evaluate an application's capacity to secure in-the-moment purchases.
- Review and Feedback Datasets: To illustrate and assess the application's internal feedback system.

The importance is in developing a digital marketplace specifically for the agriculture industry's special requirements, promoting direct interactions between producers and consumers.

### 5.4.1 Paper Link

Access the full paper at https://ieeexplore.ieee.org/abstract/document/9776930.

# 6 Paper 6: Cloud Based Virtual Agriculture Marketing and Information System (C-VAMIS)

**Journal/Conference Rank:** N/A
**Publication Year:** 2015
**Reference:** [6]

## 6.1 Summary

For a sizeable section of the population in India, agriculture is their main source of income. But because there are so many middlemen in the conventional agricultural marketing system, both farmers and consumers face difficulties. The suggested system uses information and communication technologies (ICT) and cloud-based technology to build a virtual agricultural market in order to address these problems. Eliminating middlemen, ensuring timely delivery of agricultural products, lowering product waste, providing affordable products to consumers, analyzing product demand, providing farmers with up-to-date agricultural knowledge, maintaining vital data in the Cloud, and enhancing farmer welfare through various programs are the system's main goals.

The transport system, farmers, clients (wholesalers/retailers), Nodal Centers, and the Cloud-Based Virtual Agricultural Marketing and Information System (CLOVAMINS) are some of the important parts and actors that make up the system.

In addition to offering infrastructure, cold storage, training, and information on agriculture to farmers, the Nodal Centers act as central hubs that facilitate the gathering and sale of perishable agricultural goods. Farmers can tell the Nodal Center when their goods are ready for sale by using AKASH tablets to connect with the center. The transport system guarantees that items are moved smoothly when customers register their product needs with the Nodal Center.

A cloud-based system called CLOVAMINS links Nodal Centers, centralizes data, and has an intuitive user interface. Additionally, it supports end-user programs for customers, farmers, and transportation.

The system's main objectives are to empower farmers, improve marketing efficiency, lessen product waste, and give consumers timely access to inexpensive agricultural goods.

By utilizing ICT and data analytics, it also strives to improve agricultural competitiveness.

In conclusion, the suggested approach is an all-inclusive response to the modernization of agricultural markets in India. It aims to address the issues with conventional agriculture via the use of technology and a cloud-based platform, helping farmers and customers alike and maybe boosting the economy in rural regions.

## 6.2 Software Architecture

The five primary actor categories in the suggested architecture are as follows: the Nodal Center,

Cloud-based agricultural marketing and information systems, customers, and transportation. Regarding PAP (Perishable Agricultural Product) market participation, these actors

are understood to mean:

The Nodal Center's responsibilities include,

• It makes the purchase and sale of perishable agricultural products (PAP) easier.
offering the best available market pricing to the customers.

• It offers services and modern infrastructure, including cold storage facilities.
In respect to storing the goods for direct marketing, available to farmers
repacking, etc.

• It offers sufficient and affordable transportation options that might allow the
The nodal hub is where farmers should provide their excess product for selling.

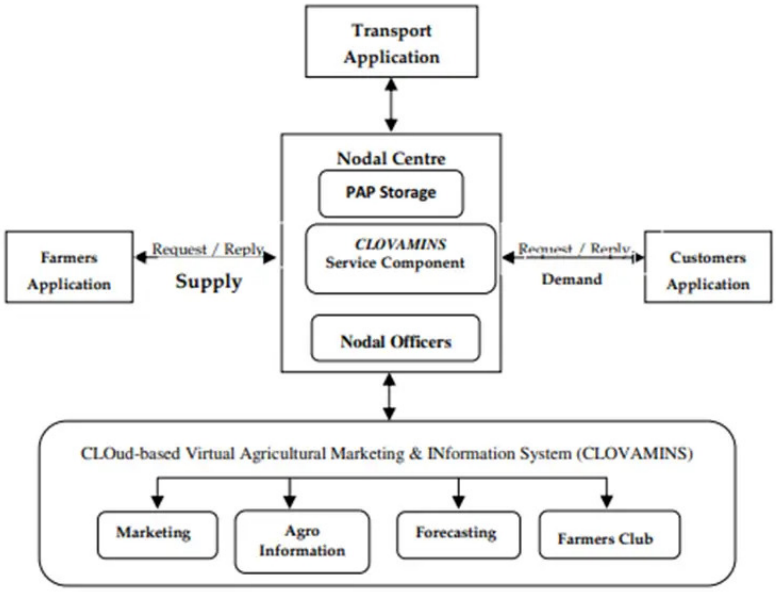



Figure 6: Software architecture diagram for Paper 6.

## 6.3 Data Parameters

Farmer Data:

Name Address Mobile Number Bank account number Product details (production type, variety, packaging, estimated production quantity, quality, availability, price)

Customer Data (Wholesalers/Retailers):

Name Address Phone number Bank Account Number Types of marketing (daily or weekly requirements)

Transport Data: Contact person details Number of trucks and containers Characteristics of each vehicle (e.g., refrigerated or not) Ability to group loads Estimated period of availability Transportation expenses Product Data:

Type and variety of crops Cultivation methods Free-text descriptions or field images Product pictures Marketing Component Data:

Details of products available for sale Customer orders and requirements Fulfillment of current requirements

## 6.4 Datasets Used

Farmer Data: Information about individual farmers, their land, cultivation practices, and the products they produce.

Customer Data: Information about customers (wholesalers/retailers), their requirements, and their orders for agricultural products.

Transport Data: Details of available transport services, including the number and characteristics of vehicles, scheduling information, and transportation expenses.

Product Data: Information about the agricultural products available for sale, including crop types, varieties, and quality.

Marketing Component Data: Data related to the supply and demand of agricultural products, as well as the fulfillment of current requirements.

Agricultural Knowledge and Information: Data related to the latest farming technologies, weather forecasts, and other relevant agricultural information.

### 6.4.1 Paper Link

Access the full paper at www.academia.edu/21306950/Cloud$_{B}ased_{V}irtual_{A}griculture_{M}arketing_{a}nd_{I}nf$

# 7 Paper 7: Online Agro Product Shop

**Journal/Conference Rank:** N/A
**Publication Year:** 2022
**Reference:** [7]

## 7.1 Summary

The "Online Agro Product Shop" project seeks to provide an easily navigable website for the online purchase and selling of agricultural products. The main objective is to alleviate the problems encountered by farmers who frequently must go to nurseries and stores to buy necessities like seeds, insecticides, and fertilizers. The options and information they require may not always be presented during these encounters.

To address these issues, the project will develop a web application that provides in-depth details about a range of agricultural items, including plants, seeds, fertilizer, and pots. This data is easily accessible, and users can easily shop online and compare costs. Customers, farmers, and dealers may all register as users through the project, which creates individual user identities for everyone.

Key features of the project include:

1.User registration and login system. 2.Product selection and addition to the cart. 3.Online payment and cash-on-delivery options for customers. 4.Administrative functions for user management and order tracking. 5.Farmer-specific product management, including adding, editing, and publishing products. 6.Discounts for customers based on available offers. 7.Dealer registration for purchasing products at reduced prices.

The project's ultimate goal is to increase agricultural goods' accessibility to farmers and consumers while giving them the knowledge they need to make wise decisions. By bridging the gap between conventional agricultural supply techniques and the ease of internet purchase, it strives to improve consumer choice.

By offering a platform that encourages information exchange and accessible purchase alternatives for all interested parties, the project's success might have a significant positive impact on the agriculture sector.

## 7.2 Software Architecture

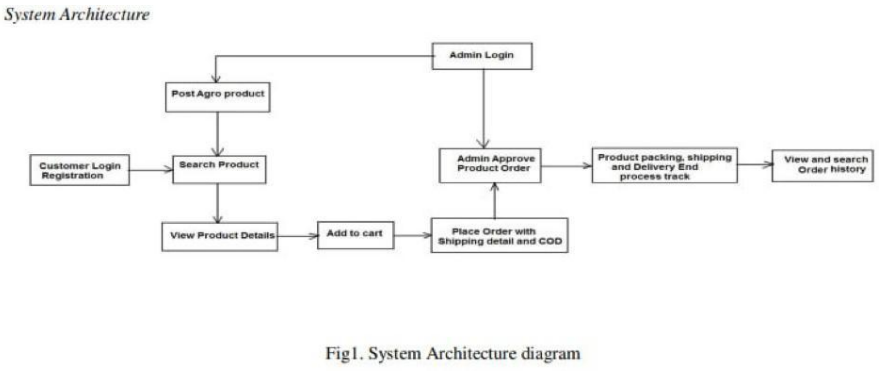



Figure 7: Software architecture diagram for Paper 7.

## 7.3 Data Parameters

1. User Data: Customer Data: Farmer Data: Dealer Data:

2. Product Data: 3. Order Data: 4. Category Data: 5. Admin Data: 6. Location Data: 7. Special Offers and Discounts: 8. Website Activity and Usage Data:

## 7.4 Datasets Used

1.Product Information Dataset: 2.User Data Dataset: 3.Order History Dataset: 4.Category Dataset: 5.Admin Data Dataset: 6.Location Dataset: 7.Special Offers and Discounts Dataset: 8.Website Activity and Usage Data Dataset: 9.Payment and Transaction Data: 10.Location-Based Data (Optional):

### 7.4.1 Paper Link

Access the full paper at https://www.academia.edu/82092830/Online$_{A}gro_{P}roduct_{S}hop$.

# 8 Paper 8: SELLING & BUYING AGRICULTURAL PRODUCTS USING ANDROID APPLICATION

**Journal/Conference Rank:** N/A
**Publication Year:** 2021
**Reference:** [8]

## 8.1 Summary

An Android application is described in the abstract as a means of overcoming the difficulties farmers encounter while trying to sell their produce. Farmers frequently lack market pricing expertise and may wind up selling their goods at cheaper prices to local brokers, incurring huge financial losses. By removing the need for middlemen, the proposed application aims to enable farmers to sell their goods directly to consumers. It has features that let customers and farmers interact and conduct online business. The main goals include building a platform for broker-free agricultural product sales and a setting where agricultural items may be bought and sold using an Android application.

In order to emphasize the significance of technology in assisting farmers, the abstract also makes references to previous literature and other agricultural uses. The findings of the project highlight the importance of user-friendly interfaces, secure payment and delivery options, feedback and rating systems, location-based services, education and support for farmers, security and privacy measures, scalability, and successful marketing tactics for the application's success.

## 8.2 Software Architecture

This picture primarily shows how a consumer wants to purchase a product and then searches for it. If he locates it, he will go to the seller's location and description, give him a call, and then purchase the item. He will evaluate the product review and exit the application if he decides not to purchase the product.

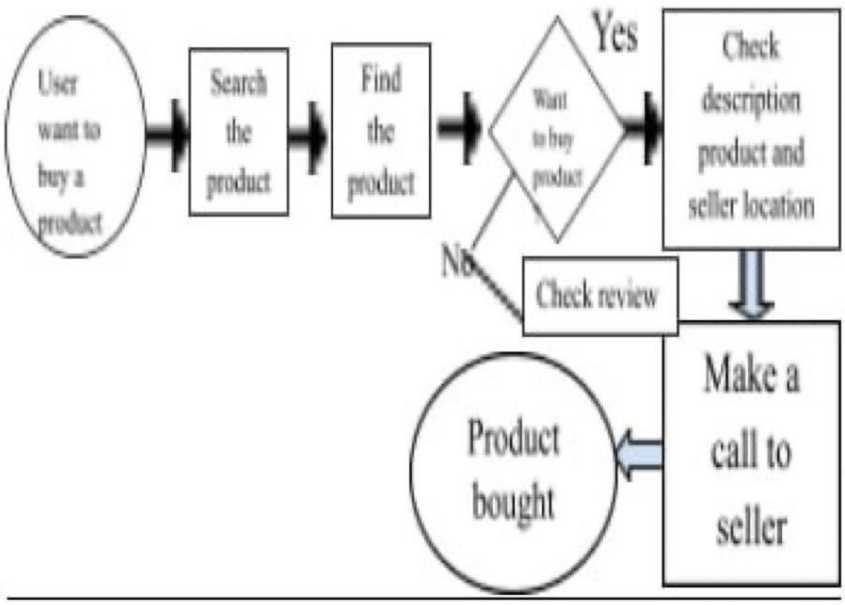



Figure 8: Software architecture diagram for Paper 2.

### 8.3 Data Parameters

1.User Data: 2.Product Data: 3.Transaction Data: 4.Feedback and Ratings: 5.Geolocation Data: 6.Market Data: 7.Support and Education Data: 8.Security and Privacy Data: 9.Application Usage Data:

### 8.4 Datasets Used

1.Crop and Product Data: 2.Geospatial Data: 3.Market Price Data: 4.Weather Data: 5.User Profile Data: 6.Product Images: 7.Transaction Records: 8.Support and Education Content:

#### 8.4.1 Paper Link

Access the full paper at https://papers.ssrn.com/sol3/papers.cfm?abstract$_id$ = 3847520.

## 9 Paper 9: Research and Application of Agricultural Internet of Things Technology in Intelligent Agriculture

**Journal/Conference Rank:** A*
**Publication Year:** 2021
**Reference:** [9]

## 9.1 Summary

Through IoT and high-tech breakthroughs, China is quickly upgrading its agricultural industry with an emphasis on intelligent agriculture. The utilization of intelligent technology and the Internet of Things in numerous facets of agricultural production is summarized in the study. These comprise an Internet of Things (IoT)-based monitoring system for agriculture, smart irrigation systems, expert systems for pest management, and agricultural marketing platforms.

The article focuses on the use of IoT to environmental monitoring, irrigation, pest management, and agricultural product marketing. It highlights how IoT has the potential to boost agricultural productivity and sustainability.

In the Central Document No. 1 of 2019, it is recommended to adopt a digital rural strategy and increase the use of IoT in agriculture. Even while China has made strides in intelligent agriculture, there are still issues including a lack of technological know-how and a lack of finance and mature infrastructure.

IoT technology is crucial in changing conventional agricultural techniques into contemporary, effective, and sustainable ones. To do this, China must solve issues with its infrastructure, finance, and people resources as well as tailor IoT solutions to the specifics of its agriculture sector.

## 9.2 Software Architecture

Sensors and devices: These are the actual Internet of Things hardware tools that gather information from the agricultural environment. This may involve sensors that gauge temperature, humidity, soil moisture, and other variables. Microcontrollers are frequently used to link these devices.

Data collection and transmission: Data is sent to a central hub or gateway from the sensors. Wi-Fi, cellular networks, and LoRaWAN are just a few of the communication protocols that may be used to transmit this data.

Data processing and analysis: software is at the core of the system and is used to process and analyze incoming data. It's possible for this program to function on edge computing or cloud servers. Algorithms for machine learning and data analytics are frequently employed to extract insights from the data.

User Interface: Both administrators and farmers have user interfaces. These interfaces give users access to historical data as well as real-time data visualization and control choices. Web-based or mobile apps are also acceptable. Control and Automation: Depending on the system's capabilities, control mechanisms for modifying irrigation systems, turning equipment on or off, or launching alarms in reaction to certain circumstances may be included.

Database: A database is used to store configuration settings, historical data, and other pertinent information.

Security: Security is an essential element, given the sensitivity of agricultural data and the possibility for remote control. This includes access restrictions, data encryption, and user authentication.

IoT Platform: An IoT platform frequently acts as the hub for connectivity, device management, and data collecting. These systems can be installed locally or in the cloud.

Integration: In order to give thorough insights, the system may need to interface with other farm management systems, weather forecasting services, or other data sources.

Reporting and Alerts: Using the data analysis, the system creates reports and alerts. Email, SMS, and push notifications can all be used to deliver alerts.

## 9.3 Data Parameters

1.Environmental Data: 2.Crop-Related Data: 3.Irrigation Data: 4.Pest and Disease Monitoring: 5.Crop Imaging and Video Data: 6.Market and Supply Chain Data: 7.Weather Data: 8.Security Data:

## 9.4 Datasets Used

1.Weather Datasets: 2.Soil Datasets: 3.Crop Growth Datasets: 4.Irrigation Datasets: 5.Market and Price Datasets: 6.Security and Surveillance Datasets:

### 9.4.1 Paper Link

Access the full paper at https://iopscience.iop.org/article/10.1088/1742-6596/1769/1/012020/pdf.

# 10 Paper 10: A Web System for Farming Management

**Journal/Conference Rank:** N/A
**Publication Year:** 2013
**Reference:** [10]

## 10.1 Summary

In order to help small farmers in economically underdeveloped areas like Brazil's "territórios da cidadania," the study describes a web-based farming management system that was particularly created for dairy farming. The system is built on a conceptual framework that separates the farm structure into three sub-systems: decision support, technical, and bio-physical. It was created with the Model-View-Controller (MVC) architecture and a technique called Interdisciplinary Research Project Management (IRPM) that combines the Evolutionary Acquisition strategy.

The system's objective is to assist these farmers in raising their output while taking environmental sustainability and sustainable development into account. It serves as a conduit between government organizations, specialist technicians, and farmers, offering direction and assistance for farm management. The relevance of software architecture's capacity to evolve and its part in promoting software evolution are both emphasized in the article. The system, as a whole, is a component of a larger effort to enhance the production systems of economically disadvantaged farming communities in order to better those people' livelihoods.

## 10.2 Software Architecture

Model-View-Controller (MVC) Pattern: Evolutionary Acquisition: Interdisciplinary Research Project Management (IRPM): User Feedback Database: Web Services Core: Additional Technologies and Tools:

## 10.3 Data Parameters

Farm Information: Production Data: Technical Information: Decision Support Data: User Feedback: User Information: Environmental Data:

## 10.4 Datasets Used

Geospatial Data: Weather Data: Crop and Livestock Data: Market Data: Environmental Data: Soil Data: Pest and Disease Data: Remote Sensing Data:

### 10.4.1 Paper Link

Access the full paper at https://www.researchgate.net/publication/255992501$_{AW}eb_{S}ystem_{f}or_{F}arming_{M}$

# 11 Paper 11: Smart Farm Web Application Using Machine Learning Algorithm

**Journal/Conference Rank:** N/A
**Publication Year:** 2020
**Reference:** [11]

## 11.1 Summary

This paper describes the problems which are faced by small landowners in India and other countries. This paper introduces a web application named E-Farming, which is designed to support village farmers by providing them with information on crop estimation, prices, and other relevant data using machine learning algorithms. The primary goal of E-Farming is to empower farmers by reducing their dependency on intermediaries, enhancing agriculture's efficiency, and promoting technology in agriculture.

## 11.2 Software Architecture

This architecture contains three key roles: Admin, Farmer, and User. Users can participate in e-shopping for crops, while Machine learning algorithms offer benefits to farmers. That also offers awareness on crop prediction and forecasting the price based on data parameters such as Fertilizers, diseases, research work, and market trends. This empowers farmers to take decisions about crop selection, pricing and help to reduce intermediaries' dependency. System management is overseen by the admin, data integrity, and user support. This architecture describes a seamless flow of data, enabling users to make crop purchases, while Transactions are managed by the admin.

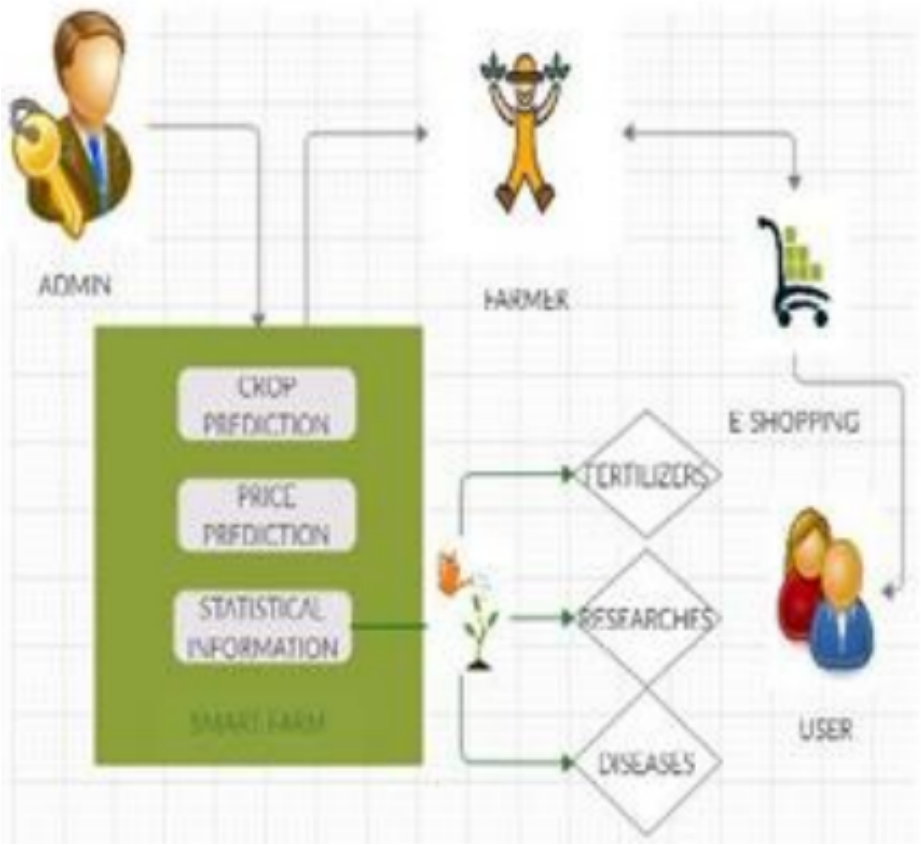



Figure 9: Proposed Architecture.

## 11.3 Data Parameters

The data parameters used in this paper are Annual Rainfall (AR), Area Under Cultivation (AUC), and Food Price Index (FPI). These data parameters are used in machine learning algorithm and statistical analysis specifically in regression and other analyses to estimate crop yield.

## 11.4 Datasets Used

The datasets used here are the NPK values of soil, Soil type and weather data. These datasets are used for statistical analysis and regression for crop prediction and price estimation. These datasets helped to train the machine learning algorithm for better performance.

### 11.4.1 Paper Link

Access the full paper at Smart Farm Web Application Using Machine Learning Algorithm.

# 12 Paper 12: Architecture & Design of a Smart Farm System Based on Big Data Appliance Machine Learning.

**Journal/Conference Rank:** Q1
**Publication Year:** 2020
**Reference:** [12]

## 12.1 Summary

This paper describes the architecture and design of a Smart Farm System that utilizes Big Data Appliance Machine Learning to enhance crop productivity. As the world population continues to grow, this paper addresses the challenge of feeding the global population. It also deals with environmental degradation, urbanization, and the lack of urban services. This paper proposes a Smart Farm System based on Big Data Application Machine Learning, with a focus on crop productivity and increasing farmers' income. By leveraging machine learning, this system offers insights into crop quality and market prices, benefiting both farmers and consumers.

## 12.2 Software Architecture

This paper describes the architecture and design of a Smart Farm System that utilizes Big Data Appliance Machine Learning to enhance crop productivity. As the world population is growing day by day, this paper addresses the challenge of feeding the global population. It also deals with environmental degradation, urbanization, and the lack of urban services. The paper proposes a Big Data Application Machine Learning-based Smart Farm System with a focus on improving crop productivity and increasing farmers' income. By using machine learning, this system provides insights into crop quality and market prices, making it beneficial for both farmers and consumers.

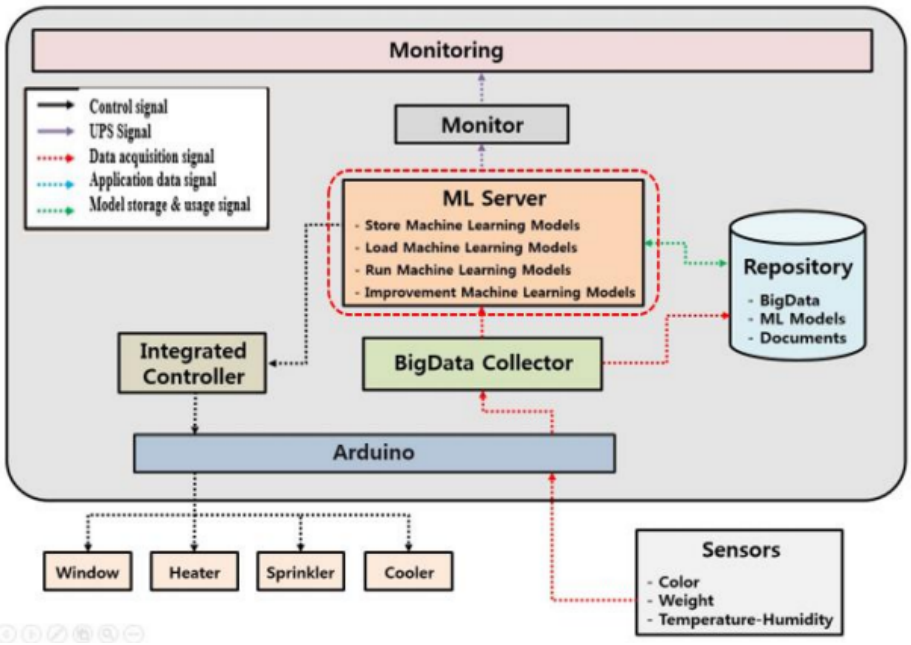



Figure 10: Data processing via machine learning.

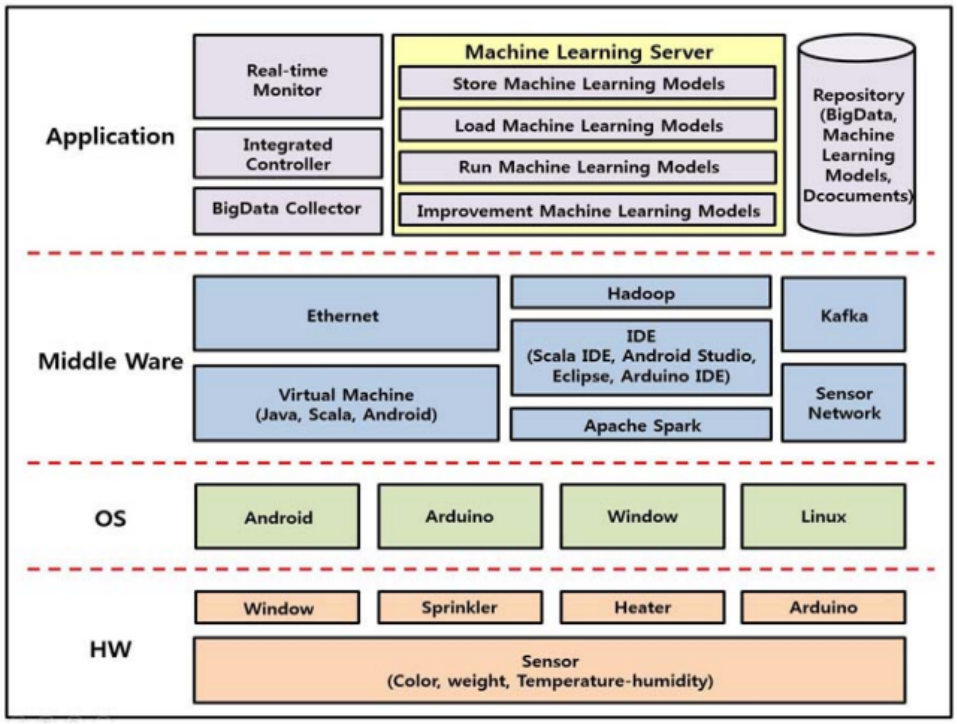



Figure 11: Data processing via machine learning.

## 12.3 Data Parameters

The data parameters used in this paper are real-time data from sensors:

1. Temperature,

2. Humidity,
3. Soil Nutrition,
4. Environmental factors that impact crop growth.

## 12.4 Datasets Used

This paper used a dataset which is real-time data collected from various sensors. So, the real time datasets are temperature dataset, humidity dataset, soil nutrition dataset and environmental factor dataset. These datasets are utilized for making informed decisions and predictions regarding crop growth and management.

### 12.4.1 Paper Link

Access the full paper at Architecture & Design of a Smart Farm System Based on Big Data Appliance Machine Learning.

# 13 Paper 13:A Web Designed Smart Farming System: "Application from Farmers to Consumers"

**Journal/Conference Rank:** N/A
**Publication Year:** 2022
**Reference:** [13]

## 13.1 Summary

This paper focuses on addressing the issues faced by farmers due to extreme poverty. It also describes the solution of farmers' intermediaries' dependency. In the traditional method, there are intermediaries between farmers and consumers. Intermediaries buy the products from the farmers at a cheap price and supply them to consumers at a high price. So, this paper emphasizes the role of technology in improving agricultural practices and encourages direct sales between farmers and consumers. This study also explores changes in consumer preferences, especially the shift towards online purchasing of fresh fruits and vegetables. This paper also designed a web model for selling the products between farmers and consumers.

## 13.2 Software Architecture

This architecture uses three user roles: admin, farmer, and consumer. The consumer cannot access the farmer's portal section. In this architecture, after logging in, the admin can add farmers, view crops, products, and orders. The farmer can view products, orders, and add crops. Consumers can view products sold by farmers, add items to the cart, make purchases, and complete payments. Everyone can log in and log out.

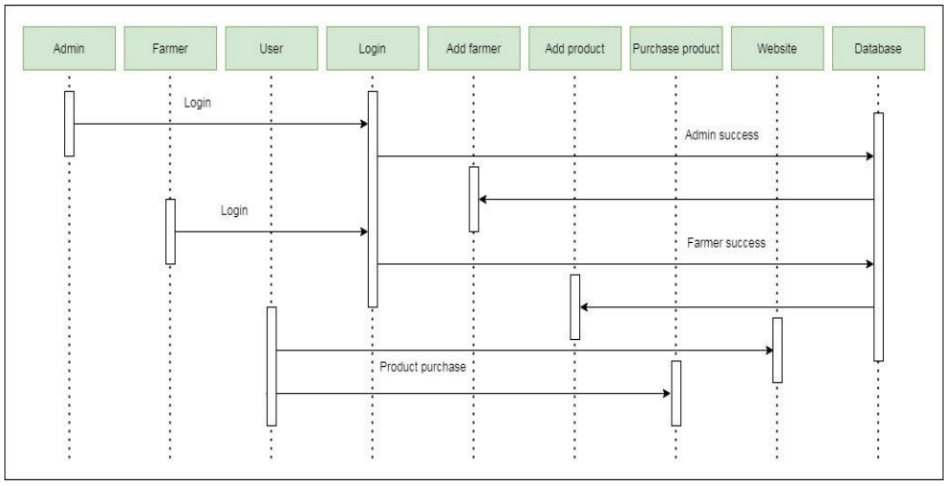



Figure 12: Web Application Architecture.

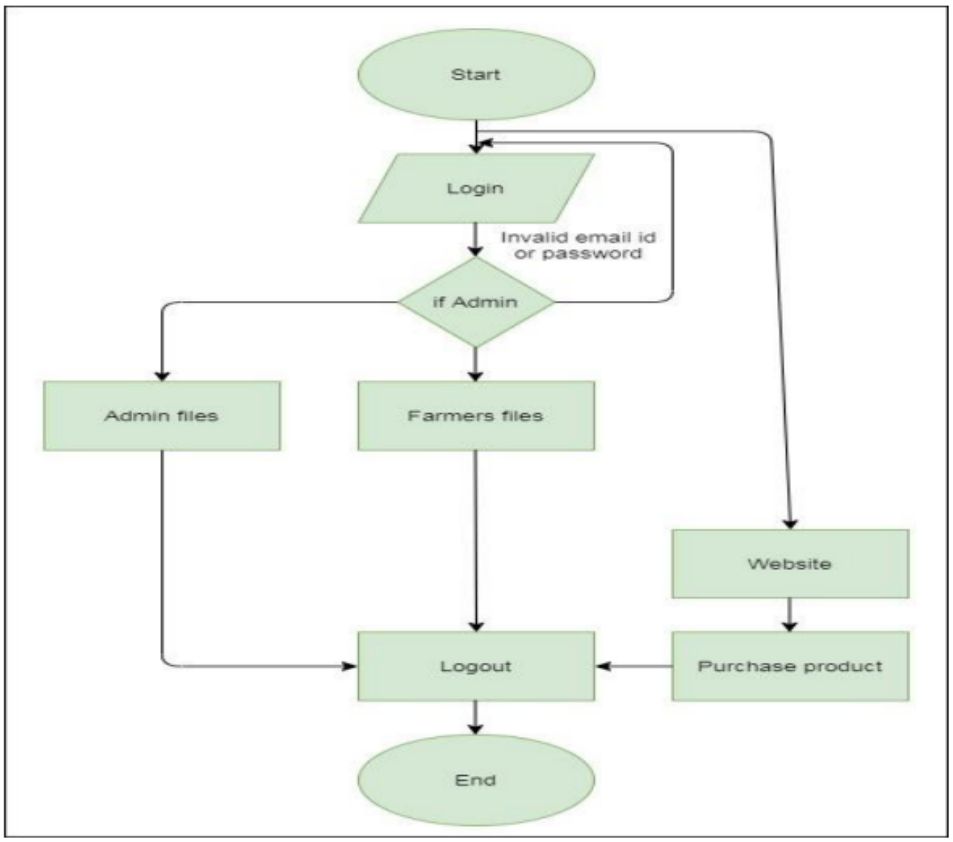



Figure 13: Work flow diagram.

## 13.3 Data Parameters

The data parameters of this paper include basic login and signup information as well as order details. These parameters are as follows:

1. Username,

2. Password,
3. User type,
4. Crop name and price,
5. Order details (ID, tracking, etc.).

## 13.4 Datasets Used

This paper does not mention any specific datasets used in the research. However, for this type of web application, the datasets typically include:

1. User information dataset,
2. Crops dataset,
3. Farmers information dataset,
4. Order tracking dataset.

### 13.4.1 Paper Link

Access the full paper at A Web Designed Smart Farming System: "Application from Farmers to Consumers".

# 14 Paper 14: Factors Affecting Farmers' Willingness to Adopt a Mobile App in the Marketing of Bamboo Products

**Journal/Conference Rank:** N/A
**Publication Year:** 2021
**Reference:** [14]

## 14.1 Summary

This research paper focuses on the willingness to adopt a mobile app in the marketing of bamboo products and investigates the determinants influencing the adoption of a mobile app among bamboo farmers for marketing their products. The study delves into the various factors that shape farmers' perceptions and decisions related to the utilization of a mobile application called Bamboost. Through empirical research, the paper aims to provide insights into the adoption of innovative technologies within the agricultural sector, particularly in the context of bamboo product marketing.

## 14.2 Software Architecture

This paper does not provide specific details about the software architecture used in the study. It primarily focuses on factors influencing technology adoption rather than the technical aspects of the mobile app's architecture.

## 14.3 Data Parameters

This research involves collecting and analyzing data parameters related to farmers' perceptions and their willingness to adopt the Bamboost mobile app. The data parameters include:

- Perceptions: This paper examines farmers' perceptions of the mobile app, considering factors like perceived usefulness, perceived ease of use, perceived convenience, and perceived cost.
- Willingness to adopt: This parameter assesses farmers' inclination and readiness to embrace the mobile app for marketing their bamboo products.
- Demographic and socio-economic variables: This study considers various demographic and socio-economic factors that may influence technology adoption, such as age, education, income, and experience in bamboo farming.

## 14.4 Datasets Used

This paper utilizes datasets that capture information about bamboo farmers' perceptions and their willingness to adopt the Bamboost mobile app. These datasets are crucial for understanding the factors affecting the adoption of this technology in the bamboo product marketing context. However, the paper does not provide extensive details regarding the datasets used, such as the size of the sample, data collection methods, or specific data sources. Further information on the datasets may be available in subsequent sections of the paper.

# 15 Paper 15: Enhancing Smart Farming through the Applications of Agriculture 4.0 Technologies

**Journal/Conference Rank:** Q3
**Publication Year:** 2022
**Reference:** [15]

## 15.1 Summary

This paper "Enhancing smart farming through the applications of Agriculture 4.0 technologies" aims to explore how Agriculture 4.0 technologies, including the Internet of Things (IoT), data analytics, and precision farming, can be applied to enhance modern agriculture practices. It likely discusses the benefits of these technologies in improving crop productivity, reducing environmental impact, and optimizing decision-making in the agricultural sector.

## 15.2 Software Architecture

This paper may describe the software architecture used to implement Agriculture 4.0 technologies. This could include details on the software platforms, databases, and communication protocols used to collect, store, and process data from various sensors and devices in smart farming.

## 15.3 Data Parameters

This paper might specify the data parameters or variables that are collected and analyzed in the context of smart farming. These parameters could include environmental data like temperature, humidity, and soil conditions, as well as data related to crop health and growth. Data parameters may vary depending on the specific technologies and sensors used in the study.

## 15.4 Datasets Used

This paper describe the datasets used in the research. These datasets are likely collected from various sources, such as IoT sensors, drones, and other data-gathering devices. The paper may explain how these datasets are crucial for monitoring and making informed decisions about crop management, irrigation, pest control, and other agricultural practices.

# 16 Paper 16: Multi-Vendor E-commerce Website for Farmers

**Journal/Conference Rank:** N/A
**Publication Year:** 2021
**Reference:** [16]

## 16.1 Summary

To help farmers, the offered paper offers the idea of applying e-commerce in the agricultural industry. It discusses the difficulties farmers experience in getting fair rates for their produce and aims to use digital technology to help them. The article focuses on the potential advantages of technology for farmers, including information technology and mobile accessibility. The need to empower farmers and improve market transparency are highlighted as reasons for integrating e-commerce in agriculture. To make buying and selling agricultural products more convenient, the paper explains the recommended features of an e-commerce platform. In summary, the study predicts that e-commerce in agriculture will improve farmers' livelihoods by giving them a way to get fair compensation for their labor and by utilizing technology to improve agricultural methods.

## 16.2 Software Architecture

The suggested e-commerce platform for farmers is not explicitly described in the article in terms of the software architecture used to construct it. The idea and inspiration for bringing e-commerce to agriculture, as well as its potential advantages and platform capabilities, are the paper's main points. As a result, it skips over any technical details or software architecture used to develop the platform.

## 16.3 Data Parameters

Although some of the data parameters utilized on the website are mentioned in the article, a clear list of them is not provided. These are a few of the data parameters:

1. User information, including name, email, phone number, and address. 2. Details on the product, including name, category, price, quantity, description, and image. 3. Order information, including the order ID, date, time, status, method of payment, and delivery address. 4. Details of feedback include rating, review, date, and time.

## 16.4 Datasets Used

The provided paper does not define any datasets or their importance, nor does it specifically acknowledge the usage of any particular datasets. The paper's main objectives are to introduce the idea of an e-commerce platform for farmers and to go over its justification and prospective advantages.

### 16.4.1 Paper Link

Access the full paper at https://doi.org/10.21203/rs.3.rs-498792/v1.

# 17 Paper 17: Agriculture Marketing Using Web and Mobile-Based Technologies

**Journal/Conference Rank:** N/A
**Publication Year:** 2022
**Reference:** [17]

## 17.1 Summary

The paper "Agriculture Marketing Using Web and Mobile-Based Technologies" outlines the creation of a web and mobile application to transform agricultural marketing in India. The main objective is to guarantee fair prices for farmers while doing away with middlemen. The article highlights the difficulties farmers experience as a result of several middlemen and investigates the potential of web and mobile technology to close the gap between producers and customers.

Farm items will be easily accessible to customers and retailers thanks to the planned application's professional analysis and quality evaluations. This strategy seeks to give consumers fair pricing while increasing the profit margin for farmers by putting farmers in direct contact with purchasers. The article shows the possibility for greater earnings by contrasting the prices of products sold through middlemen versus those offered through the application.

The report recognizes the significance of improving agricultural marketing, streamlining the procedure, and doing away with middlemen, which will ultimately benefit both farmers and consumers. A plea for coordinated action to improve and reinvent agricultural marketing in India is made as it comes to a close.

In conclusion, the paper outlines a vision for employing web and mobile technology to improve agricultural marketing, lessen the need for middlemen, and guarantee fair prices for farmers, all of which would support the agricultural sector's sustainable expansion in India.

## 17.2 Software Architecture

The software architecture utilized to construct the online and mobile application for agricultural marketing is not covered in detail by the study. It largely focuses on the application's concept and goals, the difficulties farmers encounter, and the possible advantages of doing away with middlemen in the agricultural marketing process.

## 17.3 Data Parameters

The paper does not explicitly list or describe specific data parameters used in the proposed web and mobile application for agricultural marketing. The paper primarily discusses the high-level concept and objectives of the application, the challenges faced by farmers, and the potential benefits of direct communication between farmers and consumers.

## 17.4 Datasets Used

The usage of certain datasets is not specifically mentioned in the study "Agriculture Marketing Using Web and Mobile-Based Technologies" by Abishek A.G., Bharathwaj M., and Bhagyalakshmi L. As a result, no datasets are described in the work, and the importance of any datasets is not touched upon.

The idea of leveraging web and mobile applications to link farmers directly with consumers and cut out intermediaries in agricultural marketing is the primary emphasis of the paper. It talks about the potential advantages of such a platform in terms of fair pricing and increased farmer profitability, but it doesn't go into specifics regarding any particular datasets that were utilized to back up these assertions or to create the program.

### 17.4.1 Paper Link

Access the full paper at https://doi.org/10.1109/TIAR.2016.7801211.

# 18 Paper 18: An E-store for Farmers Buying Seeds

**Journal/Conference Rank:** N/A
**Publication Year:** 2011
**Reference:** [18]

## 18.1 Summary

The report suggests an online marketplace where farmers may buy seeds and other agricultural supplies directly from manufacturers without going through any middlemen. The purpose of the paper is to aid farmers in time, money, and labor savings while preserving product quality and originality. The platform's attributes and layout are also discussed in the report, including personalized suggestions, customer support, and secure login.

## 18.2 Software Architecture

The software architecture utilized in creating the e-commerce platform for farmers is described in the paper "An E-store for Farmers Buying Seeds." The system's architecture

is intended to give a general picture of how its many parts and technologies interact to deliver the desired functionality. The parts of the software architecture are broken down as follows:

Next.js client interface

Next.js, an open-source JavaScript framework that supports server-side rendering and creates static websites, is used to build the system's front end. React-based web applications that offer a seamless user experience can be created with Next.js. The E-commerce platform can have a quick and engaging user experience thanks to Next.js. Amplify by AWS:

The client interface is managed and maintained using AWS Amplify. Amazon Web Services offers an open-source JavaScript library that speeds up the deployment of apps and scales cloud services. With continuous deployment, every time a piece of code is added to the Git repository, the web application is updated. AWS WAF (AWS Web Application Firewall):

The application is protected from DDoS (Distributed Denial of Service) attacks using AWS WAF. By specifying security criteria, it enables control over which traffic to allow or prohibit, ensuring that requests are secure before data is fetched. CloudFront by AWS

AWS CloudFront employs edge servers close to customers to deliver content fast through a content delivery network (CDN). To provide content with minimal latency, it caches static resources such as CSS files, pictures, and other resources in edge locations. Amazon S3 Bucket

Static assets and user assets like resources and photos are kept in Amazon Simple Storage Service (S3). S3 enables effective file management and dissemination, and the E-commerce platform can access these files. Lambda@Edge:

Low-latency server-side rendering is provided by Lambda@Edge, which enables serverless execution of Lambda functions on CloudFront's cache servers. A quick and responsive user experience is made possible by server-side rendering, which takes place near end users. DynamoDB:

Amazon's NoSQL database service for structured documents is called DynamoDB. It manages data retrieval and storage for user profiles, product details, and order history. In situations where numerous users might change attributes at once, DynamoDB is appropriate. The software architecture of the e-commerce platform is made up of these elements. The user-facing front-end is the client interface (Next.js), while numerous backend operations are handled by AWS services including Amplify, WAF, CloudFront, S3, and DynamoDB.

Scalability, speed optimization, and secure content distribution are made possible through the usage of serverless architecture and AWS services. The platform's architecture is created to streamline the process of buying agricultural seeds and other relevant products for both farmers (platform users) and administrators (platform producers).

## 18.3 Data Parameters

Some of the data parameters used in the platform are mentioned in the study, including:

1. User information, including name, email address, phone number, and role (such as manufacturer or farmer). 2. Product information, including name, category, cost, quantity, description, appearance, and certification. 3. Order information, including the order ID, date, time, status, method of payment, and delivery address. 4. Feedback information, including rating, review, date, and time.

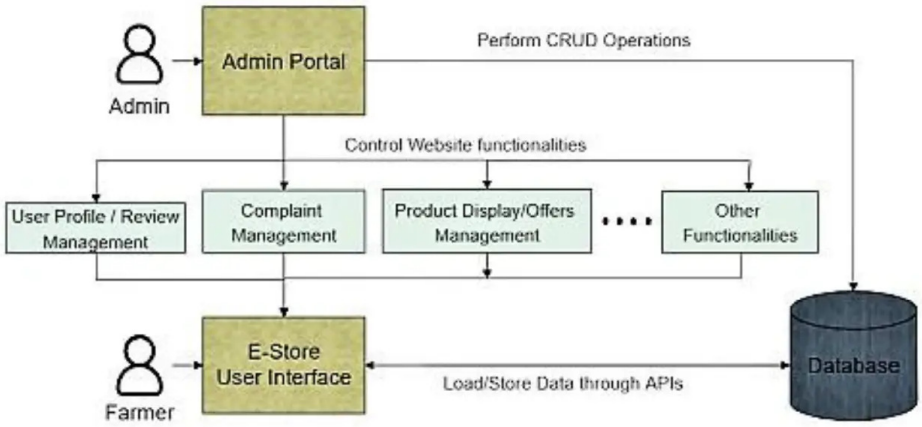



Figure 14: Overview of E-store

## 18.4 Datasets Used

The usage of particular datasets is not specifically mentioned in the paper. Instead, it focuses on the design and construction of an online store that allows farmers to buy agricultural products, especially seeds, directly from producers. The system's importance rests in its capacity to offer farmers a direct-to-consumer (D2C) channel, doing away with the need for middlemen and giving farmers a more practical and affordable means to acquire high-quality seeds and agricultural products. To improve the client experience, the platform also provides services like discounts, user reviews, complaint management, and purchase tracking. The use of certain datasets or data sources is not covered in detail, despite the paper's discussion of the system's different features and parts.

### 18.4.1 Paper Link

Access the full paper at https://doi.org/10.1109/CONIT55038.2022.9848390.

# 19 Paper 19: Smart auction system flow model for Agro-Based sector farmers using blockchain technology

**Journal/Conference Rank:** N/A
**Publication Year:** Year
**Reference:** [19]

## 19.1 Summary

A blockchain-based approach is suggested in the study titled "Smart Auction System Flow Model for Agro-Based Sector Farmers Using Blockchain Technology" to enhance the agricultural supply chain, particularly in agricultural auctions. The following are the paper's main points:

The article explains why blockchain technology should be used in the agriculture industry to address problems such as a lack of transparency, expensive middlemen, a lack

of funding, and a disconnect between producers and merchants.

Existing System: It discusses the difficulties that traditional middlemen still dominate auctions in the present agricultural supply chain, despite government attempts like the e-NAM portal.

mechanism Proposed: The study proposes a blockchain-based decentralized state-level auction mechanism. Farmers would use auctions overseen by a government-appointed chairperson to sell their goods directly to retailers, traders, and consumers. The program seeks to increase openness and get rid of intermediaries.

Imaginary Auction System (With a Focus on Fruits) The suggested system includes data gathering on farmer and product information, chairperson-determined starting bid prices, and beneficiary selection based on suppliers' contributions. To track harvests and suppliers, regular data updates are necessary, and payments are dependent on production volumes.

Work Model Discussions: The authors intend to create a decentralized application (Dapp) for the suggested auction system utilizing Solidity for smart contracts that would function on the Ethereum network.

Conclusion Future Improvement: By removing middlemen, assuring transparency, and offering fair prices, the suggested approach aims to help farmers. In the future, the authors intend to create and implement the Dapp for this agro-based sector auction system.

Data Availability Statement: As part of an ongoing study, the report notes that the data used to support the conclusions cannot be provided at this time.

In conclusion, the study shows how blockchain technology can address issues in the agricultural supply chain by introducing a decentralized auction system that gives farmers more power and lessens the impact of middlemen. It provides a way to improve the fairness and openness of agricultural auctions.

## 19.2 Software Architecture

The suggested blockchain-based smart auction system for farmers in the agro-based industry does not have a detailed technical description of the software architecture in the study. It does, however, highlight important elements and ideas pertinent to the software architecture:

Blockchain is the primary technology employed by the suggested system. Agricultural auction transactions, opening bids, and other pertinent data are recorded on a decentralized ledger called the blockchain. It guarantees the transparency and immutability of data.

The usage of smart contracts, which are self-executing contracts with the terms of the agreement explicitly put into code, is alluded to in the study. The blockchain's smart contracts enable the auction process, set beginning bids, and automate payments by predetermined regulations.

Blockchain Ethereum: When creating accounts on the Ropsten test network, the paper references Ethereum. Smart contracts and decentralized applications (Dapps) are frequently used on the Ethereum platform. It is probably the blockchain system that was selected to implement the suggested auction system.

The report makes mention of Metamask, a web browser extension that makes it easier to create and manage blockchain accounts. It is used to record transactions and link beneficiaries and bidders to their addresses.

Web browser: The suggested solution uses web browsers to communicate with the Ethereum blockchain. Web browsers with extensions like Metamask are used by users to access the system, including beneficiaries, bidders, and buyers.

Government Nominations: According to the report, the government should nominate a chairperson to direct and coordinate the auction process. This suggests a centralized control system to guarantee oversight and compliance with regulations.

## 19.3 Data Parameters

A complete set of data parameters or technical information on data structures are not included in the publication. It does, however, refer to a few data-related ideas and elements. The following is an explanation of these data parameters:

1. Personal Identification Details: The term "personal identification details" in this paper refers to the gathering of information that can be used to identify a specific person, such as their name and perhaps even an image. These specifics are necessary for locating the system's stakeholders.

2. Product Information: This consists of information about the agricultural goods that are traded, grown, and harvested. The particular data parameters for this category are not specified in the study, although they would normally include the product's type (for example, fruits or vegetables), the quantity on hand, its quality characteristics, and its anticipated lifespan.

3. amount: One crucial data characteristic of agricultural products is their amount. It aids in calculating the quantity of a certain item up for auction, which in turn affects pricing and bidding.

4. Aspects that characterize the quality of agricultural products, such as freshness, appearance, flavor, and any other pertinent quality qualities, may be included in quality data parameters.

5. Product Life Span: This data attribute probably refers to the anticipated shelf life or time frame during which a product is still safe for consumption. Pricing and procurement choices may be affected.

6. GPS Location: Locating supplier's or procurement centers' geographic coordinates requires using the GPS location data parameter. After price fixation, it assists in discovering nearby procurement points, maybe assisting in logistics.

7. Beneficiaries: The study discusses how farmers or suppliers are categorized according to their contribution to products and their designation as beneficiaries. The exact items and appropriate quantities for which each farmer is a beneficiary may be included in the data parameters for beneficiaries.

8. The auction system would include data parameters linked to the bidding process, even if it is not stated explicitly in the paper. This would comprise bid amounts, the initial bid price determined by the beneficiaries, and the winning bid price.

9. Bank Account Information: The transfer of funds to associated bank accounts is mentioned in the article, indicating that bank account information is pertinent information. Payment interactions with farmers or suppliers are made easier thanks to the usage of this data.

## 19.4 Datasets Used

The research article titled "Smart Auction System Flow Model for Agro-Based Sector Farmers Using Blockchain Technology" does not specifically name any datasets or offer a thorough explanation of the datasets utilized in the study. Instead, it largely focuses on putting forth a conceptual framework for an agriculture sector blockchain-based auction system. As a result, the report doesn't go into great detail about datasets or their importance.

The discussion of blockchain technology's potential use in the agricultural supply chain and how it can handle concerns with transparency, middlemen, and the direct relationship between farmers and purchasers is more theoretical. The idea of leveraging blockchain technology to build a decentralized auction system is emphasized.

The study largely serves as a conceptual examination of how blockchain technology might increase transparency and efficiency in agricultural commodity auctions because it doesn't go into specific datasets, their sources, or their significance. Any real-world use of such a system would call for the definition and use of pertinent datasets pertaining to product specifics, farmer data, price, and transaction history.

### 19.4.1 Paper Link

Access the full paper at https://doi.org/10.1016/j.matpr.2021.05.634.

# 20 Paper 20: Farmer's E-mart : An E-Commerce Store For Crops

**Journal/Conference Rank:** N/A
**Publication Year:** 2007
**Reference:** [20]

## 20.1 Summary

The study outlines an online marketplace that enables farmers to sell their goods directly to consumers without the use of middlemen. The purpose of the document is to support the farmers' financial independence and revenue growth. The platform's capabilities and advantages, including inventory management, payment gateways, location-based search, and organic certification, are all covered in the paper.

## 20.2 Software Architecture

The article employs a three-tier design with a presentation layer, a business logic layer, and a data layer for the e-commerce platform. The platform's functionality and logic are implemented by the business logic layer, the data layer controls data storage and retrieval, and the presentation layer regulates user interface and interaction.

## 20.3 Data Parameters

The report mentions several of the platform's data parameters, including:

1. Information about the user, such as name, email, phone number, and role (buyer or farmer), etc. 2. Information on the crop, including its name, category, cost, amount, description, image, and certification. 3. Order information, including the order ID, date, time, status, method of payment, and delivery address. 4. Details of feedback include rating, review, date, and time.

### 20.4 Datasets Used

Any datasets used for the platform's development or evaluation are not mentioned in the publication. However, it makes note of the platform's use of Google Authenticator for secure login and Google Maps API for location-based search. The article also mentions that the site makes use of a third-party service to confirm the crops' organic certification.

## 21 Paper 21: AGRICULTURE BASED APPLICATION FOR FARMERS

**Journal/Conference Rank:** Q1
**Publication Year:** 2012
**Reference:** [21]

### 21.1 Summary

This paper is about the importance of Indian farmers and the difficulties they encounter in obtaining prompt and relevant information regarding their crops and weather conditions. The paper introduces a mobile application tailored to agriculture, with the primary goal of enhancing farming practices. This app offers an array of features, including real-time market prices, weather predictions, innovative farming tips, and in-depth crop knowledge. Moreover, it tackles the problem of middlemen profiting at the expense of farmers by introducing a platform that allows farmers to sell their produce directly. Additionally, the app serves as a source of agricultural news and information on government initiatives. The authors employ a method that generates valuable insights by analyzing crop data, weather conditions, and the resources accessible to farmers.

### 21.2 Software Architecture

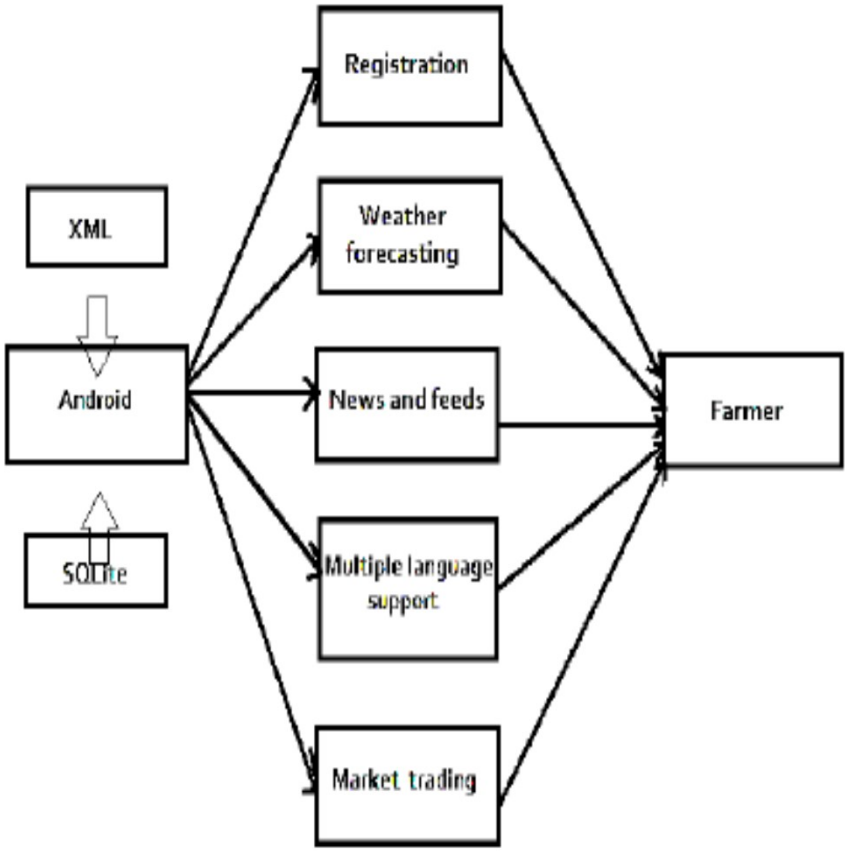



Fig: System Architecture of the proposed model

Figure 15:

## 21.3 Data Parameters

a)User Module. b)Home Screen. c) Prediction.

## 21.4 Datasets Used

a)User Module: The User module do the registration in the application. The application provide the details to the user that he wants to access. All the details of user will be stored into the database and it can be secured. b)Home Screen: Home Screen is the main page of this Application. This module shows some category options to the user 80to their choice. By clicking someone option user get main page of that particular category which is easy to use by the user. It shows three type option: 1. Weather forecast 2. Market Rates 3. Government Schemes

1) Weather forecasting: This weather service is a novel concept which helps the farmers in exploring the details of the weather of a particular location. The farmer can check the details like humidity of any district on the given day, sunrise, sunset, pressure.

2) Market Rates: Market Price is important module of this application.it shows the entireVegetables and fruits price list that are available in the market. The vegetable price

is updated by APMC. The price of vegetable is periodically updated by the admin or head of local market members.

3) Government Schemes: Government of India will launch different Programs which are beneficial to Farmers but drawback of poor performance of this program are they are not able to reach every person and not able to give proper information so here we provide detailed information and Process of different programs.

c) Prediction: Depending on the certain market conditions of current week and previous one or two week, our system will predict future rates.

### 21.4.1 Paper Link

Access the full paper at https://www.irjet.net/archives/V8/i3/IRJET-V8I3298.pdf.

# 22 Paper 22: Blockchain based solution to improve the Supply Chain Management in Indian agriculture

**Journal/Conference Rank:** Q1
**Publication Year:** 2012
**Reference:** [22]

## 22.1 Summary

The paper is about the possible applications of blockchain technology in agriculture supply chain management and its ability to increase transparency and traceability. The study highlights the challenges faced in the recent agricultural supply chain in India and shows blockchain as a solution to spot these challenges and improve the security and immutability of data. Blockchain is offered as a technology capable of providing increased security and traceability throughout the agricultural supply chain.

## 22.2 Software Architecture

Describe the software architecture used in the paper.

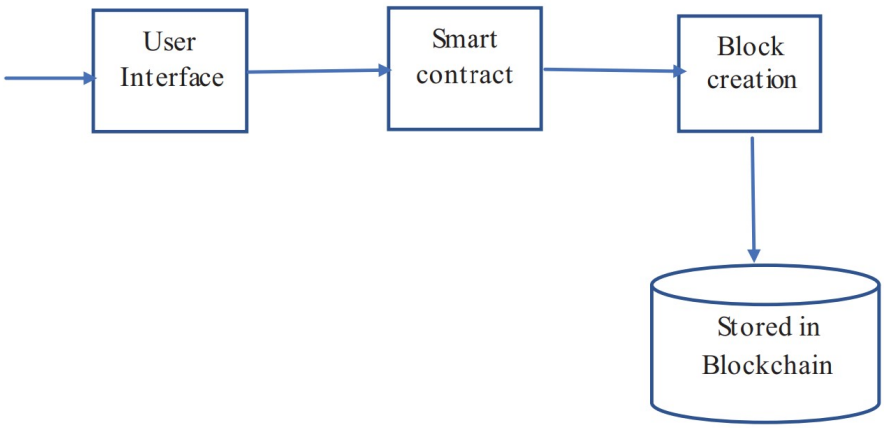



**Fig 1. Proposed system**

Figure 16:

## 22.3 Data Parameters

The data parameters are the specific values and attributes related with each crop. The parameters are:

1. Crop Type (e.g., Tomato, Brinjal, Lady's Finger) 2. Crop Area (in Hectares) 3. Investment (in Rs) 4. RoI in Traditional Marketing (in Rs) 5. RoI after Employing IoT to Monitor the Status of Goods (in Rs) 6. RoI after Employing IoT to Take Action During Transportation (in Rs) 7. RoI after Employing Blockchain (in Rs) 8. RoI after Employing IoT Blockchain (in Rs)

## 22.4 Datasets Used

This dataset gives information on different crops, their respective areas of cultivation (in hectares), the initial investment made (in Rs - Indian Rupees), and various Return on Investment (RoI) values in different scenarios. The dataset includes three crops: Tomato, Brinjal, and Lady's Finger. For each crop, the following information is provided:

Crop Type: This parameter shows the specific type of crop being cultivated, such as Tomato, Brinjal, or Lady's Finger. It is important because it indicates the variety of crops under inspection.

Crop Area (in Hectares): The area in hectares where each crop is cultivated is an important parameter. It helps to understand the scale of cultivation and resource allocation for each crop type.

Investment (in Rs): This parameter represents the initial investment in Indian Rupees required for cultivating each crop. It's essential for calculating the Return on Investment (RoI) and understanding the financial aspect of crop cultivation.

RoI in Traditional Marketing (in Rs): This value shows the importance of the Return on Investment achieved using traditional marketing methods. It is significant because it serves as a baseline or reference point for evaluating the impact of newer technologies.

RoI after Employing IoT to Monitor the Status of Goods (in Rs): This RoI value highlights the impact of employing Internet of Things (IoT) technology to monitor the

status of goods during cultivation and marketing. It is crucial in the benefits of IoT implementation.

RoI after Employing IoT to Take Action During Transportation (in Rs): This parameter measures the RoI achieved by using IoT technology to take action during transportation, possibly to reduce losses or ensure product quality. It's significant for evaluating the transportation phase's impact.

RoI after Employing Blockchain (in Rs): This RoI value represents the impact of implementing blockchain technology in the crop supply chain. It is important for understanding the benefits of blockchain to increasing transparency and security.

RoI after Employing IoT  Blockchain (in Rs): This parameter shows the combined RoI when both IoT and blockchain technologies are used. It helps to check the synergy and overall impact of employing both technologies together.

### 22.4.1 Paper Link

Access the full paper at 10.1109/ICAIS50930.2021.9395867.

# 23 Paper 23: iFarm: Development of Web-based System of Cultivation and Cost Management for Agriculture

**Journal/Conference Rank:** A*
**Publication Year:** 2014
**Reference:** [23]

## 23.1 Summary

The research paper "iFarm: Development of Web-based System of Cultivation and Cost Management for Agriculture" by Yukikazu Murakami from Kagawa National College of Technology in Japan discusses the development of a web-based system to optimize farming management in the context of precision agriculture. The paper explores the importance of efficient cultivation management, record-keeping, and cost control in agriculture. It highlights the limitations of conventional paper-based record-keeping systems, emphasizing the need for advanced digital solutions.

## 23.2 Software Architecture

Describe the software architecture used in the paper.

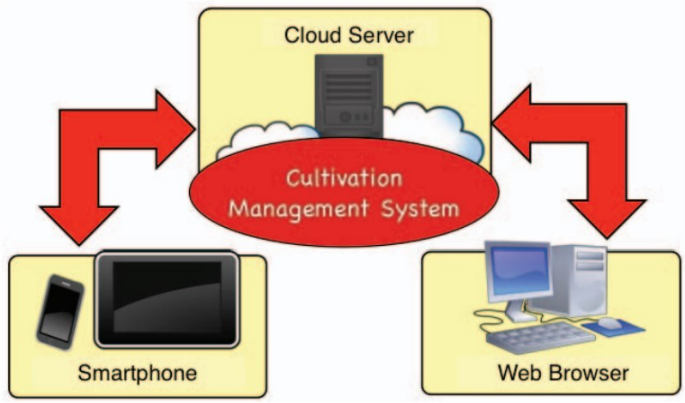



Fig. 1. Outline of proposed system

Figure 17:

## 23.3 Data Parameters

The parameters, or attributes, of the dataset are the columns within each table. Here are the parameters for each of the tables mentioned in the dataset:

1. Areas 2. Farmhouses 3. Farms 4. Products 5. Worknames 6. Worktypes 7. Operating Schedule 8. Chemicals 9. Manures 10. Workers 11. Carries 12. Breaktimes 13. Costnames 14. Reports 15. Sowings 16. Costs 17. Used Sowings 18. Used Manures 19. Used Chemicals 20. Work Photos 21. Work Workers 22. Work Information

These parameters represent the specific attributes or information being stored in each table, and they provide a structured way to manage and analyze data related to agricultural operations.

## 23.4 Datasets Used

The datasets provided in the table represent various tables within a database designed for an agricultural data management system. Each table serves a specific purpose in the system. Let's describe the datasets and their significance:

Areas: This table stores the regional names of different fields. It helps in organizing agricultural activities by associating specific regions or areas with particular farming tasks.

Farmhouses:

Records the names of individual farmhouses. This table is valuable for tracking farming activities based on the locations of different farmhouses.

Farms:

Contains the names of fields or farms. Useful for managing and tracking different agricultural fields and their respective activities.

Products: Stores the names of agricultural products or crops. It helps in keeping a record of the types of crops being cultivated and the yields from each.

Worknames: Records the names of various agricultural operations or tasks. This table is essential for categorizing and tracking different farming tasks.

Worktypes: Contains the types or categories of agricultural operations. This table classifies farming tasks into different types, making it easier to manage and analyze activities.

Operating Schedule: Stores schedules for different agricultural operations. It allows for planning and tracking the timing of specific farming tasks.

Chemicals: Records the names of chemicals used in farming. Valuable for monitoring and managing the use of chemicals in agriculture.

Manures: Contains names of different types of manures used for farming. This table helps in keeping track of the use of manure as a fertilizer.

Workers: Stores the names of workers involved in farming activities. Essential for assigning tasks to specific workers and tracking their contributions.

Carries: Records the size or capacity of containers used in farming. Useful for determining the capacity of containers used for transporting crops or materials.

Breaktimes: Manages break times for workers. Important for scheduling breaks during labor-intensive farming activities.

Costnames: Contains names of different costs associated with farming. Allows for categorizing and tracking various costs involved in agricultural operations.

Reports: Records generated reports for different agricultural operations. Useful for maintaining a history of reports related to farming tasks.

Sowings: Stores reports related to the sowing of crops. Provides information about the sowing process, which is crucial for crop management.

Costs: Manages different costs associated with farming. Allows for tracking and analyzing costs to ensure efficient resource allocation.

Used Sowings: Contains the names of used sowings in agricultural practices. Valuable for associating specific sowings with farming activities and their outcomes.

Used Manures: Records the names of used manures in farming activities. Helps in tracking the use of manure as a fertilizer and its impact on crop growth.

Used Chemicals: Stores the names of used chemicals in agricultural applications. Useful for monitoring and managing the use of chemicals in farming and their effects.

Work Photos: Manages pictures or photos related to farm work. Allows for visual documentation of farming activities, which can aid in analysis and decision-making.

Work Workers: Records work times of workers for various agricultural tasks. Helps in tracking labor hours and worker productivity in different farming operations.

Work Information: Contains information related to the work performed in farming. Serves as a comprehensive repository of data, enabling the analysis of farming activities.

These datasets are significant for an agricultural data management system, as they provide a structured way to store, organize, and analyze data related to farming activities.

### 23.4.1 Paper Link

Access the full paper at 10.1109/CISIS.2014.89.

# 24 Paper 24: Application and Website for Farmers to Sell Their Produce at Better Rate

**Journal/Conference Rank:** A*
**Publication Year:** 2021

**Reference:** [24]

## 24.1 Summary

The research paper titled "Application and Website for Farmers to Sell Their Produce at Better Rate" addresses a pressing issue in India, which is the economic challenges faced by farmers, particularly those belonging to the lower socioeconomic class. It introduces a mobile application and website designed to mitigate these challenges by directly connecting farmers with buyers and reducing the influence of intermediaries. This paper is situated in the broader context of utilizing technology to enhance agricultural practices and empower farmers. To understand the significance of this research, it's essential to review relevant literature and studies that highlight the importance of such initiatives.

## 24.2 Software Architecture

Describe the software architecture used in the paper.

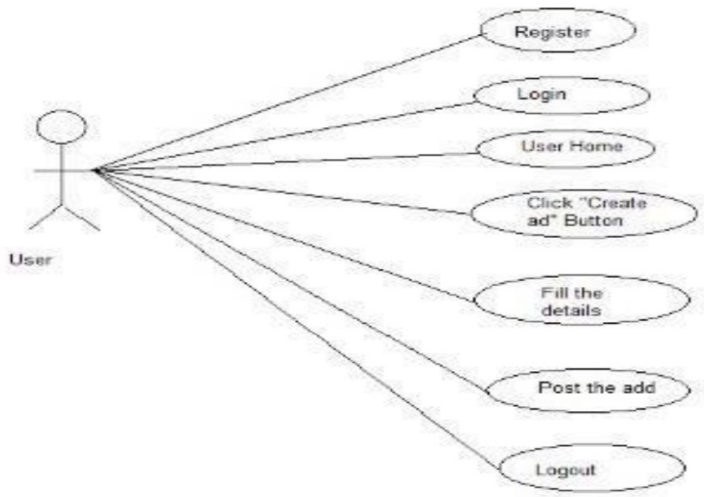



**Figure 3.1:** Use-Case Diagram

Figure 18:

## 24.3 Data Parameters

Stability of the Market

Description: This parameter assesses how stable the agricultural market is based on historical pricing and demand-supply data. Farmer Profitability

Description: Measures the profitability of farmers, taking into account the difference between what they earn and what they spend on production. Elimination of Middlemen

Description: Evaluates the extent to which the system reduces the involvement of middlemen in the buying and selling process. Direct Farmer-Retailer Transactions

Description: Measures the number of direct transactions between farmers and retailers facilitated by the system. Quality of Raw Materials

Description: Assesses the quality of raw materials provided by farmers to the food processing industry, considering factors such as freshness and consistency. User Satisfaction

Description: Evaluates the satisfaction level of users, including farmers, retailers, and consumers, through feedback and reviews. These datasets and parameters are essential for assessing the effectiveness and impact of the proposed system in helping farmers achieve better rates for their produce while streamlining the agricultural supply chain.

## 24.4 Datasets Used

Farmer Information Dataset

Parameters: Farmer name, contact information, location, experience, and crops they cultivate. Product Details Dataset

Parameters: Product name, description, quantity, quality, pricing, and images. Buyer Information Dataset

Parameters: Buyer name, contact information, location, and purchasing preferences. Market Analytics Dataset

Parameters: Market trends, demand and supply data, historical pricing, and seasonal variations. Transaction Records Dataset

Parameters: Record of all transactions, including date, product, seller, buyer, and price. Feedback and Reviews Dataset

Parameters: Feedback and reviews provided by both farmers and buyers, including ratings and comments.

### 24.4.1 Paper Link

Access the full paper at https://www.irjet.net/archives/V8/i4/IRJET-V8I4956.pdf

# 25 Paper 25: Adoption of the Internet of Things (IoT) in Agriculture and Smart Farming towards Urban Greening: A Review

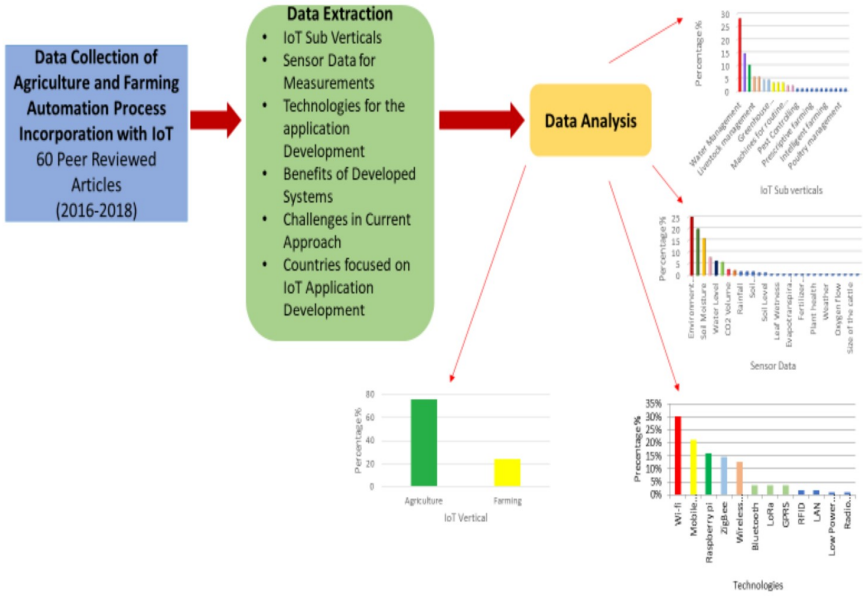
**Journal/Conference Rank:** N/A
**Publication Year:** 2019
**Reference:** [25]

## 25.1 Summary

The adoption of the Internet of Things (IoT) in agriculture and farming has led to significant advancements in these fields. IoT, which involves connecting devices and systems through the internet, presents novel ways to tackle persistent challenges in these industries. In this review, we'll explore IoT's applications in agriculture, emphasizing its influence, key areas of focus, and advantages.

## 25.2 Software Architecture

Describe the software architecture used in the paper.




Graphical Abstract.

Figure 19:

## 25.3 Data Parameters

Year/Author: The timeline and creators of IoT applications in agriculture.

IoT Sub-verticals: The specific areas or segments within agriculture and farming where IoT technology is applied.

Measures (Data collection): The types of data gathered through IoT sensors and devices.

Technologies Used: The technological tools and systems employed to implement IoT in agriculture.

Benefits of Proposed System: The advantages and positive outcomes of the suggested IoT system.

Challenges in Current Approach: The obstacles and issues faced by existing methods and systems in agriculture and farming.

Solution for Current Issues: The proposed resolutions and remedies to address the challenges encountered in the current approach.

Drivers of IoT Application: The motivations and factors encouraging the adoption and utilization of IoT applications in this field.

## 25.4 Datasets Used

[1] Zigbee Maximize the yield of crop by monitoring agricultural parameters. Can deploy it in any type of environment for, monitoring flexibility robust

[2] Pest Irrigation process is completely controlled by computer based systems. Keep pest away from the crops. Help to faster the growth of plants. Power efficient. Only works based on the commands from user

[3] Predict and tackle drought situations to prevent loss of crops. To identify the appropriate time and in the right amount of water. High power consumption. High cost. Low coverage of ZigBee and Wi-Fi.

[4] Flood Avoidance Lessen the probability of the flood occurrences. Higher the revenue by faster the growth of crops. Ensure the durability of the soil. Notify users when any change happens. Data display is not user friendly. Compare captured values with predefined moisture values. Used solar powered batteries. [5] Overhead sprinklers. Wastage of water. Watering crops without human interaction. Analyze moisture level of ground.

[6] Water Management Soil moisture Environment temperature. Humidity Mobile technology Higher the crop. Efficient water supply. Reduced cost. Resource optimization Hard to water to crop equally due to unequal rain water distribution. Amount of water not defined. Farmers can know field status even they are at home. Efficient water management. Provide real time information. Automatic plan Watering system. [7] Nutrient Managem ent Environment temperature. Humidity Nitrogen level Prosperous level Raspberry -pi Mobile technology Wi-Fi Can monitor weather conditions. Cost effective Automatically monitored disease Associated with rice species. Low or high watering. Lack of nutrition management. Weather conditions detected. Enhanced the fertilizer amount. Can enhance the fertilizer amount. Agriculture

[8] Water management Temperature Moisture level Humidity Light Intensity Nitrogen, Phosphorus Potassium Bluetooth Wi-Fi Cost effective. High efficient water management. Higher water consumption. High power utilization. Lack of useful inference. Reduced water consumption. Better power utilization. Automated water supply system. Agriculture

### 25.4.1 Paper Link

Access the full paper at https://www.researchgate.net/publication/332762725$_{A}doption_{o}f_{t}he_{I}nternet_{o}f_{T}$

# 26 Paper 26: A Web Based Application for Agriculture: "Smart Farming System"

**Journal/Conference Rank:** N/A
**Publication Year:** 2020
**Reference:** [26]

## 26.1 Summary

In this paper, researchers talk about a web application that helps farmers find the greatest prices on farming supplies. The web application makes it easy for farmers to save money while purchasing what they need for their farming. This can be extremely beneficial for farmers looking to reduce their farming costs.

## 26.2 Software Architecture

The paper describes the many components of the application and how they fit together to make the entire system function work. In the front-end design to create the user interface, they use HTML, CSS, Bootstrap, and JavaScrip.For the backend to manage the application's inner functions and data, they use PHP, such as the Laravel framework.

## 26.3 Data Parameters

List and describe the data parameters used in the paper.

## 26.4 Datasets Used

The application provides use of different kinds of agricultural product data.This data includes details on various products that farmers may require, such as seeds, fertilisers, pesticides, and tools. It also includes details on how much things cost, if they are in stock, and where you can get them.Also, the data includes product descriptions, quantities, and quality. This helps farmers in making the right decisions when buying agricultural supplies.

### 26.4.1 Paper Link

The paper discusses the data sets of information they used. These data sets include lists of agricultural products, their cost, and location where to buy them.

https://www.warse.org/IJETER/static/pdf/file/ijeter18862020.pdf.

# 27 Paper 27: Status of Mobile Agricultural Apps in the Global Mobile Ecosystem.

**Journal/Conference Rank:** N/A
**Publication Year:** 2019
**Reference:** [27]

## 27.1 Summary

The research discusses an application for mobile devices designed to empower farmers by helping them in quickly locating and purchasing agricultural goods at the best offered prices. The app's goal is to help farmers save money while making informed purchasing decisions.

## 27.2 Software Architecture

In this paper, no specific Software Architecture is used.

## 27.3 Data Parameters

The app wants to know what crops the farmers want to grow based on that , this app suggests seed, fertiliser, pesticides and tools that will be needed for the farmer to grow their desired crops.

## 27.4 Datasets Used

The app uses various data sets to determine how much things cost for farming. These data sets show the prices of items such as seeds, fertiliser, and tools from various stores.It functions similarly to the app's price comparison feature.

### 27.4.1 Paper Link

Access the full paper at https://files.eric.ed.gov/fulltext/EJ1227665.pdf.

# 28 Paper 28: Agriculture Supply Chain Management Based on Blockchain Architecture and Smart Contracts.

**Journal/Conference Rank:** N/A
**Publication Year:** 2022
**Reference:** [28]

## 28.1 Summary

This paper analyses an innovative system that uses blockchain technology and smart contracts to help manage the flow of agricultural goods. It functions as a high-tech highway for farmers' agricultural goods, so everything arrives at the right place at the right time.

## 28.2 Software Architecture

This agricultural supply chain management system is built on two major technologies: * Blockchain technology * Smart contracts

## 28.3 Data Parameters

This application collects data about agricultural products. It tracks data such as what crops are grown, how much is produced, and their prices. Think about it as an inventory of all the farm supplies. This information assists everyone involved in making better decisions about purchasing and selling these products.

## 28.4 Datasets Used

The application collects data about various agricultural products using datasets. These datasets are like huge lists that include details such as Crop Information, Weather Data, Market Prices, Supplier Information and Historical Farming Data.

### 28.4.1 Paper Link

Access the full paper at https://www.hindawi.com/journals/acisc/2022/8011525/.

# 29 Paper 29: Web-Based Agricultural Management Products for Marketing System: Survey.

**Journal/Conference Rank:** N/A
**Publication Year:** 2023
**Reference:** [29]

## 29.1 Summary

The paper discusses how to use computers to assist farmers in selling their products. They focus on the Agricultural Information Management Systems (AIMS) industry, which is growing in popularity as agriculture expands and becomes one of the world's most profitable businesses. The paper includes a brief summary of the research, a description of the software used, a list and description of the data used in the paper, and a description of the datasets used in the paper and their significance.

## 29.2 Software Architecture

The paper describes the software that was used in the application, which is a web-based system that allows farmers to manage and sell their products online. The system is user-friendly and simple to use, with a simple interface that allows farmers to upload their products and manage their inventory.

## 29.3 Data Parameters

The paper describes the data that was used in the paper, which included information about agricultural products like crops, livestock, and other farm produce.The data parameters used in the application include the descriptions of goods, prices, quantities, and other relevant information that can help farmers in managing their inventory and selling their products online.

## 29.4 Datasets Used

The datasets used in the paper contain information about agricultural products such as crops, livestock, and other agricultural goods. Farmers can use the datasets to get up-to-date market availability and pricing information.

### 29.4.1 Paper Link

Access the full paper at https://www.researchgate.net/publication/369962033$_{W}eb-Based_{A}gricultural_{N}$

# 30 Paper 30:Internet of Things in Agriculture.

**Journal/Conference Rank:** N/A
**Publication Year:** 2016
**Reference:** [30]

## 30.1 Summary

According to the authors, many scientists are interested in this subject and have published papers on it. Asian scientists, particularly Chinese scientists, write the majority of these papers. According to the authors, the majority of papers discuss how to sense and monitor things on the farm but not how to control them. The authors believe that much more research is required before this technology can be widely used in agriculture. They contend that people should collaborate to improve and simplify agricultural technology.

## 30.2 Software Architecture

The paper does not go into detail about software architecture. The authors discuss how technology can help farmers grow crops and raise animals. According to the authors, there is still much work to be done before this technology can be widely used in agriculture.

## 30.3 Data Parameters

There are no specific Data Parameters used in this paper.

## 30.4 Datasets Used

There are no specific Datasets used in this paper.

### 30.4.1 Paper Link

Access the full paper at https://www.researchgate.net/publication/312164156$_{I}nternet_{o}f_{T}hings_{i}n_{a}gricu$

# 31 Discussion and Future Planning

All these papers focus on digital solutions for agriculture, from help portals to intricate systems integrating IoT. These papers integrate smart agricultural technologies—a popular trend—including machine learning, the Internet of Things, blockchain, with an emphasis on precision agriculture and effective resource use. Several studies examine e-commerce systems that link farmers and consumers directly to increase farmers' incomes and give consumers better access to produce. Agriculture supply chain management can be improved, and several publications have suggested using smart contracts and blockchain technology to do so. Differences come in many forms. The emphasis on certain technology varies across papers. Some emphasize the importance of blockchain

or machine learning, while others place more emphasis on IoT. Some papers may focus specifically on a particular location or culture, addressing problems and solutions pertinent to that place. The primary audience varies depending on the paper; some target farmers while others concentrate on consumers, supply chain management, or the agriculture industry. There is a gap in understanding how various technologies can work together, which is necessary for developing comprehensive, integrated solutions. There's a scant investigation of the difficulties farmers may have in implementing these technologies and potential solutions. There is space for more in-depth research on the broader impact of these digital initiatives on rural economies, some of which touch on socio-economic factors. We intend to put these plans into action. Consider creating a prototype for a smart farming application that combines many technologies. To better understand the requirements, obstacles, and preferences of local farmers in implementing digital solutions, conduct case studies with them. Implement user education programs to improve farmers' digital literacy and boost their comfort level when utilizing these tools. Create feedback mechanisms for digital platforms to iterate solutions based on user experiences and enhance them continuously.

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**32**

# PS2: Rich Picture + Data Model Submission

1. As-is rich picture of the existing system
2. To-be rich picture of the proposed system
3. ERD
4. Schema

# 5. Normalized Schema

# 6. Data Dictionary

### 32.0.1 As-is rich picture of the existing system

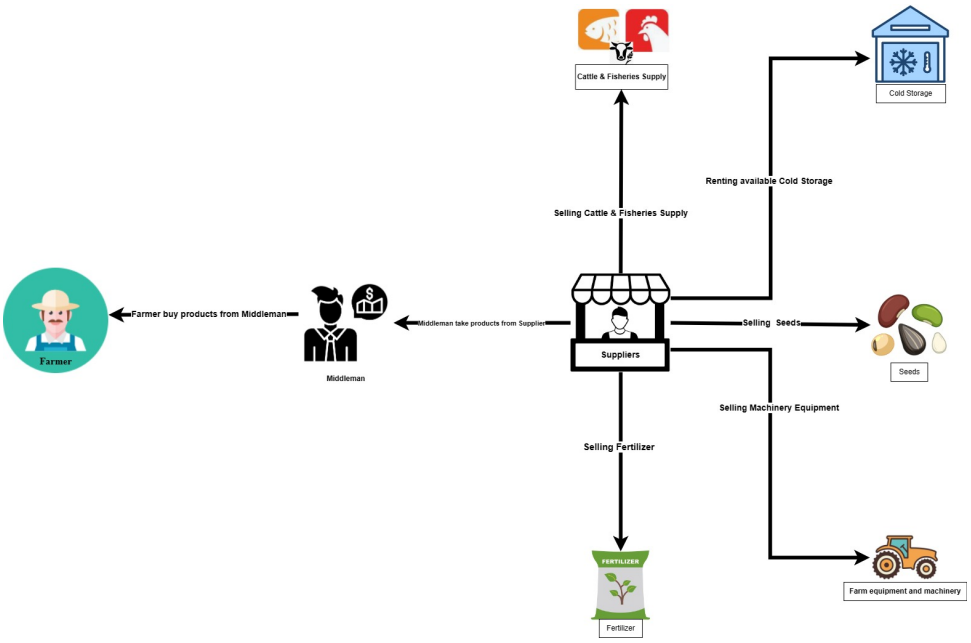


Figure 20: As-is rich picture of the existing system

### 32.0.2 To-be rich picture of the proposed system

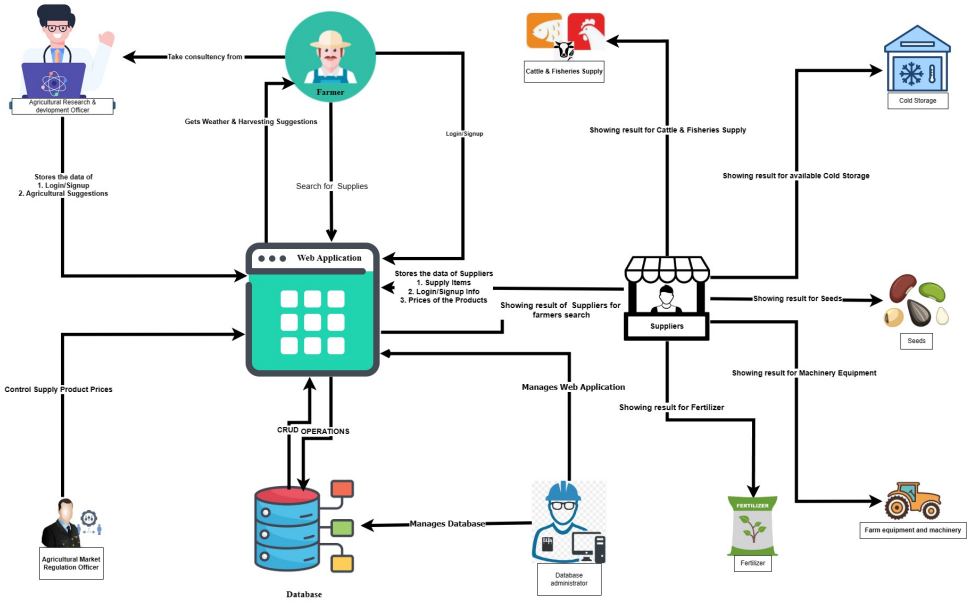


Figure 21: To-be rich picture of the proposed system

### 32.0.3 ERD

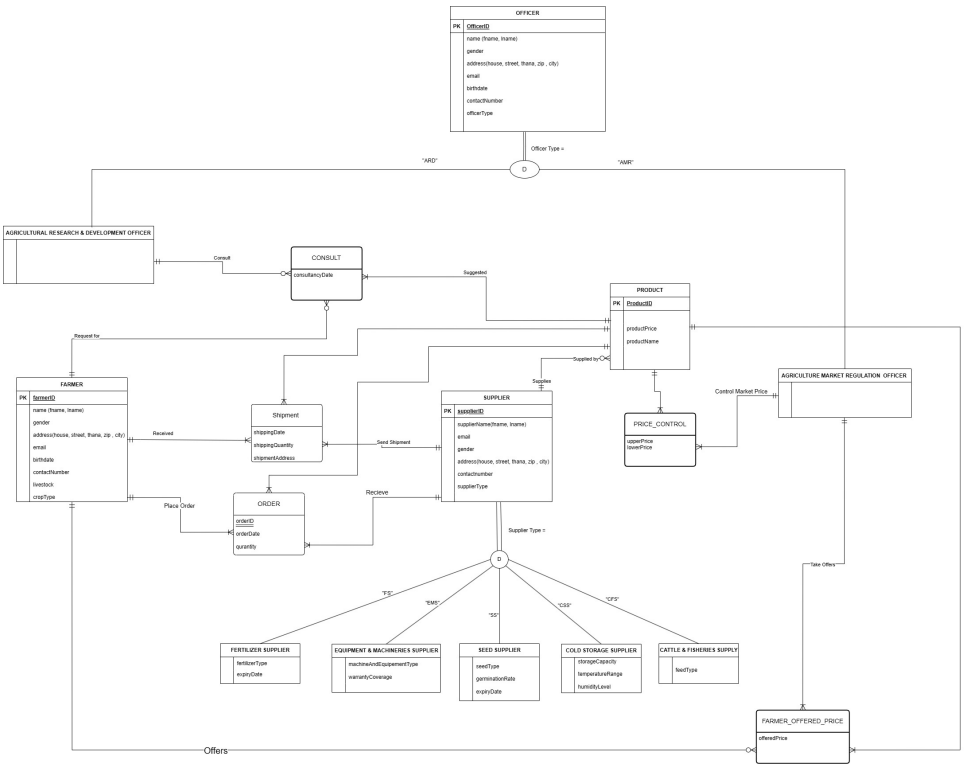


Figure 22: ERD

### 32.0.4 Schema

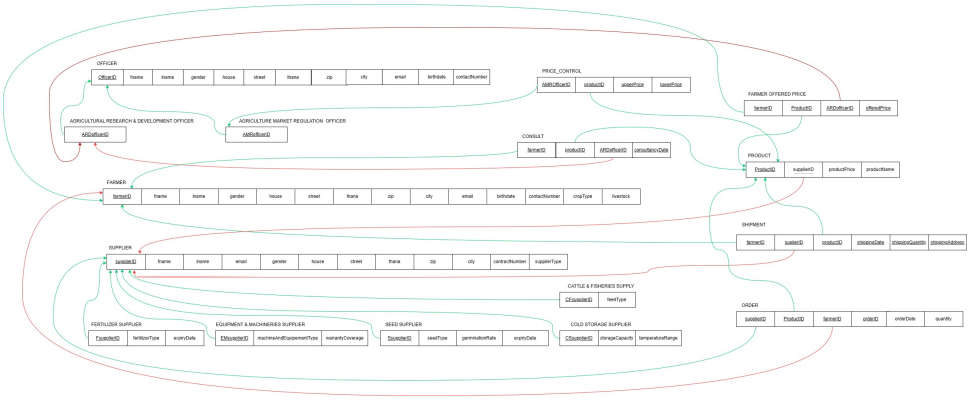


Figure 23: Schema

### 32.0.5 Normalized Schema

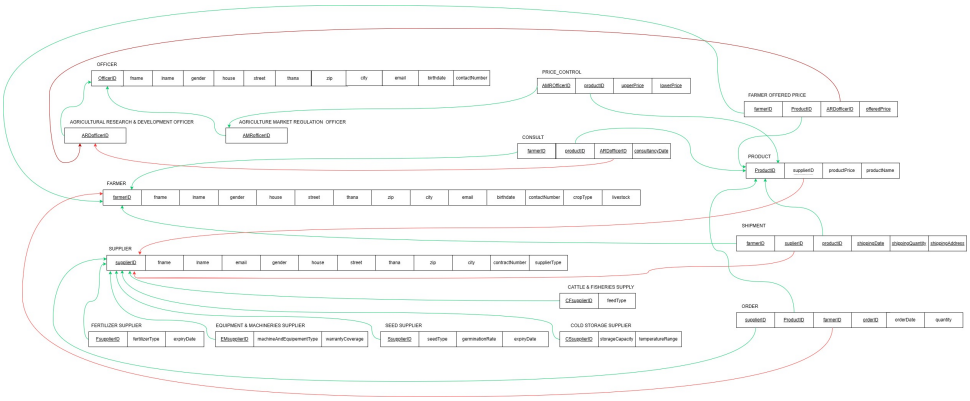


Figure 24: Normalized Schema

The relational schema provided above is already in normalized form as it complies with the norma

1NF: The schema needs to be set up so that there are no repeated groups and a primary key for ev

2NF: No non-key attribute in the schema may depend entirely on the composite main key.

3NF: There cannot be any transitive dependencies in the schema.
BCNF: A non-key in the schema cannot identify a candidate key or a portion of it.
Our schema complies with all the normalization protocols mentioned above.

### 32.0.6 Data Dictionary

**Supplier_T:**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| supplierID | CHAR | 7 | This is the primary key of the table. This contains the ID of supplier. Example: “2111261” |
| fname | VARCHAR | 10 | This contains the first name of the supplier. Example:”Abdullah” |
| lname | VARCHAR | 10 | This contains the last name of supplier. Example: “Mamun” |
| gender | VARCHAR | 6 | This contains the gender of the supplier. Example: “Male” |
| house | VARCHAR | 12 | This contains the house information of supplier. Example:”22-Basic-Prantik” |
| street | VARCHAR | 12 | This contains the street information of supplier. Example:”Road-12” |
| thana | VARCHAR | 12 | This contains the information of supplier’s thana. Example:”Sadar” |
| zip | CHAR | 4 | This contains the suppliers zip code address. Example:”1412” |
| city | VARCHAR | 15 | This contains the city name of the supplier. Example:”Dhaka” |
| email | VARCHAR | 20 | This contains the email of supplier. Example:”hridoy@gmail.com” |
| contactNumber | CHAR | 11 | This contains the contact number of the supplier. Example:”01764691362” |

Figure 25: Supplier Table

**Ssupplier_T**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| SsupplierID | CHAR | 7 | This is the primary key of the seed supplier. This contains the id of the seed supplier. Example:”2324467” |
| seedType | VARCHAR | 20 | This contains the type of seed supplier sold. Example: “Rice” |
| germinationRate | VARCHAR | 3 | This contains the germination rate of the seed.Example:”90%” |
| expiryDate | DATE | YY-MM-DD | This contains the expiry date of the seed. Example:”2023-11-29” |

Figure 26: Seed Supplier Table.

**CFsupplier_T**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| CFsupplierID | CHAR | 7 | This is the primary key of this table. This contains the id of the Cattle & Fisheries supplier. Example:"2324467" |
| feedType | VARCHAR | 12 | This contains the feed type details. Example:"Poultry feed" |

Figure 27: Cattle and Fisheries Supplier

**CSsupplier_T**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| CSsupplierID | CHAR | 7 | This is the primary key of the cold storage supplier. This contains the id of the cold storage supplier. Example:"2324467" |
| storageCapacity | VARCHAR | 15 | This contains the storage capacity of the cold storage. Example:"1000 Cubic feet" |
| temperatureRange | VARCHAR | 10 | This contains the temperature range of the cold storage. Example:"-12 Degree Celsius" |

Figure 28: Cold Storage Supplier

**EMsupplier_T**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| EMsupplierID | CHAR | 7 | This is the primary key of this table. This contains the id of the Equipment & Machineries supplier. Example:"2324467" |
| machineAndEquipemntType | VARCHAR | 20 | This contains the machine and equipment type details. Example:"Tructor" |
| warrantyCoverage | VARCHAR | 10 | This contains the warranty coverage of the product. Example:"10 Years" |

Figure 29: EQUIPMENT and MACHINERIES SUPPLIER Table

**Fsupplier_T**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| FsupplierID | CHAR | 7 | This is the primary key of the fertilizer supplier. This contains the id of the fertilizer supplier. Example:"2220368" |
| fertilizertype | VARCHAR | 20 | This contains the information of the fertilizer type the supplier sells. Example:"Urea" |
| expiryDate | DATE | YY-MM-DD | This contains the expiry date of the fertilizer. Example:"2023-11-29" |

Figure 30: Fertilizer supplier Table

**Farmer_T**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| farmerID | CHAR | 7 | This is the primary key of the table. This contains the ID of the farmer. Example: "2283363" |
| fname | VARCHAR | 10 | This contains the first name of the farmer. Example:"Masum" |
| lname | VARCHAR | 10 | This contains the last name of the farmer. Example: "Billa" |
| gender | VARCHAR | 6 | This contains the gender of the farmier. Example: "Male" |
| house | VARCHAR | 12 | This contains the house information of the farmer. Example:"22-Basic-Prantik" |
| street | VARCHAR | 12 | This contains the street information of the farmer. Example:"Road-12" |
| thana | VARCHAR | 12 | This contains the information of farmer's thana. Example:"Sadar" |
| zip | CHAR | 4 | This contains the farmer's zip code address. Example:"1412" |
| city | VARCHAR | 15 | This contains the city name of the farmer. Example:"Dhaka" |
| email | VARCHAR | 20 | This contains the email of the farmer. Example:"hasib@gmail.com" |
| birthdate | DATE | YY-MM-DD | This contains the birthdate of the farmer. Example:"1990-11-20" |
| contactNumber | CHAR | 11 | This contains the contact number of the farmer. Example:"01764691362" |
| cropType | VARCHAR | 14 | This contains the type of the crop farmers have. Example:"Rice" |
| livestock | VARCHAR | 25 | This contains the information about any livestock or the animals owned by the farmer. Example:"10 cows" |

Figure 31: Farmer Table

**Officer_T**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| officerID | CHAR | 7 | This is the primary key of the table. This contains the ID of the officer. Example: “2221793” |
| fname | VARCHAR | 10 | This contains the first name of the officer. Example:"Masum” |
| lname | VARCHAR | 10 | This contains the last name of the officer. Example: “Billa” |
| gender | VARCHAR | 6 | This contains the gender of the officer. Example: “Male” |
| house | VARCHAR | 12 | This contains the house information of the officer. Example:"22-Basic-Prantik” |
| street | VARCHAR | 12 | This contains the street information of the officer. Example:"Road-12” |
| thana | VARCHAR | 12 | This contains the information of officer’s thana. Example:"Sadar” |
| zip | CHAR | 4 | This contains the officer's zip code address. Example:"1412” |
| city | VARCHAR | 15 | This contains the city name of the officer. Example:"Dhaka” |
| email | VARCHAR | 20 | This contains the email of the officer. Example:"moaz@gmail.com” |
| birthdate | DATE | YY-MM-DD | This contains the birthdate of the officer. Example:"1990-11-20” |
| contactNumber | CHAR | 11 | This contains the contact number of the supplier. Example:"01764691362” |

Figure 32: Officer Table

**AMR_Officer_T**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| AMRofficerID | CHAR | 7 | This is the primary key of this table. It contains the id of the AMRofficer. Example:"2111261” |

Figure 33: Agriculture Market Regulation Officer Table

**ARD_Officer_T**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| ARDofficerID | CHAR | 7 | This is the primary key of this table. It contains the id of the ARDofficer. Example:"2111261" |

Figure 34: Agriculture Research and Developement Officer Table

**Product_T**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| productID | CHAR | 7 | This is the primary key of the table. This contains the ID of the product. Example: "1816802" |
| supplierID | CHAR | 7 | This is the foreign key from the Supplier_T table. Example:"2220368" |
| productPrice | NUMBER | | This contains the price of the product. Example:"300" |
| productName | VARCHAR | 15 | This contains the name of the product. Example:"Rice seed" |

Figure 35: Product Table

**Order_T:**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| orderID | CHAR | 7 | This is the primary key of the order table. This contains the order id. Example:"1992261" |
| supplierID | CHAR | 7 | This is the foreign key from the Supplier_T table. This contains the supplier ID. Example:"2111261" |
| ProductID | CHAR | 7 | This is the foreign key from the Product_T table. This contains the product ID. Example:"2111261" |
| farmerID | CHAR | 7 | This is the foreign key from Farmer_T table. This contains the farmer ID. Example:"2111261" |
| orderDate | DATE | YY-MM-DD | This contains the date of the order. Example:"2023-12-20" |
| quantity | VARCHAR | 10 | This contains the order quantity. Example:"10" |

Figure 36: Order Table

**Shipment_T**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| farmerId | CHAR | 7 | This is the foreign key from Farmer_T table. This contains the farmer ID. Example:"2111261" |
| supplierId | CHAR | 7 | This is the foreign key from the Supplier_T table. This contains the supplier ID. Example:"2111261" |
| productId | CHAR | 7 | This is the foreign key from the Product_T table. This contains the product ID. Example:"2111261" |
| shippingDate | DATE | YY-MM-DD | This contains the date of the shipping. Example:"2023-12-20" |
| shippingQuantity | VARCHAR | 15 | This contains the quantity of the product that will be shipped. Example:"10" |
| shippingAddress | VARCHAR | 25 | This contains the shipping address. Example:"H-12, R-15, 1214, Dhaka" |

Figure 37: Shipment Table

**Farmer_Offered_Price_T**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| farmerId | CHAR | 7 | This is the foreign key from Farmer_T table. This contains the farmer ID. Example:"2111261" |
| ProductId | CHAR | 7 | This is the foreign key from the Product_T table. This contains the product ID. Example:"2111261" |
| ARDofficerId | CHAR | 7 | This is the foreign key from the ARDOfficer_T table. This contains the ARDofficer ID. Example:"2111261" |
| offeredPrice | NUMBER | | This contains the offered price of the product that farmers can bear. Example:"Rice seed-100tk pac" |

Figure 38: Farmer Offered Price Table

**Price_Control_T**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| ARDofficerId | CHAR | 7 | This is the foreign key from the ARDOfficer_T table. This contains the ARDofficer ID. Example:"2111261" |
| productId | CHAR | 7 | This is the foreign key from the Product_T table. This contains the product ID. Example:"2111261" |
| upperPrice | NUMBER | | This contains the upper price of the selected product given by the ARDofficer. Example:"Rice seed-100 tk pc" |
| lowerPrice | NUMBER | | This contains the lower price of the selected product given by the ARDofficer. Example:"Rice seed-80 tk pc" |

Figure 39: Price Control Table

**Consult_T**

| Name | Data Type | Size | Remark |
|---|---|---|---|
| farmerID | CHAR | 7 | This is the foreign key from Farmer_T table. This contains the farmer ID. Example:"2111261" |
| productID | CHAR | 7 | This is the foreign key from the Product_T table. This contains the product ID. Example:"2111261" |
| ARDofficerID | CHAR | 7 | This is the foreign key from the ARDOfficer_T table. This contains the ARDofficer ID. Example:"2111261" |
| consultancyDate | DATE | YY-MM-DD | This contains the date of the consultancy. Example:"2023-11-20" |

Figure 40: Consult Table

# 33 DESIGN AND SIMULATION

### 33.0.1 Landing Page

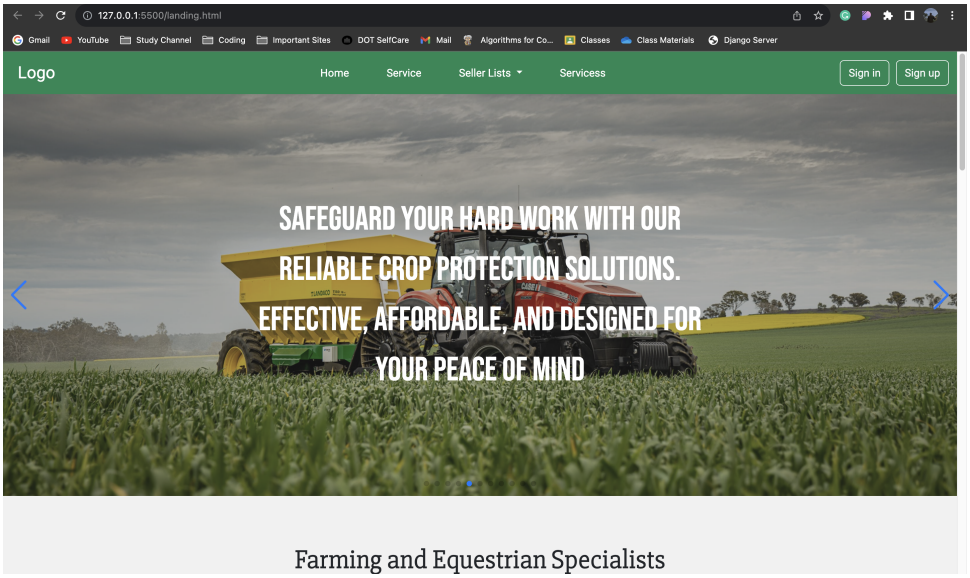


Figure 41: Landing Page

### 33.0.2 Login Page

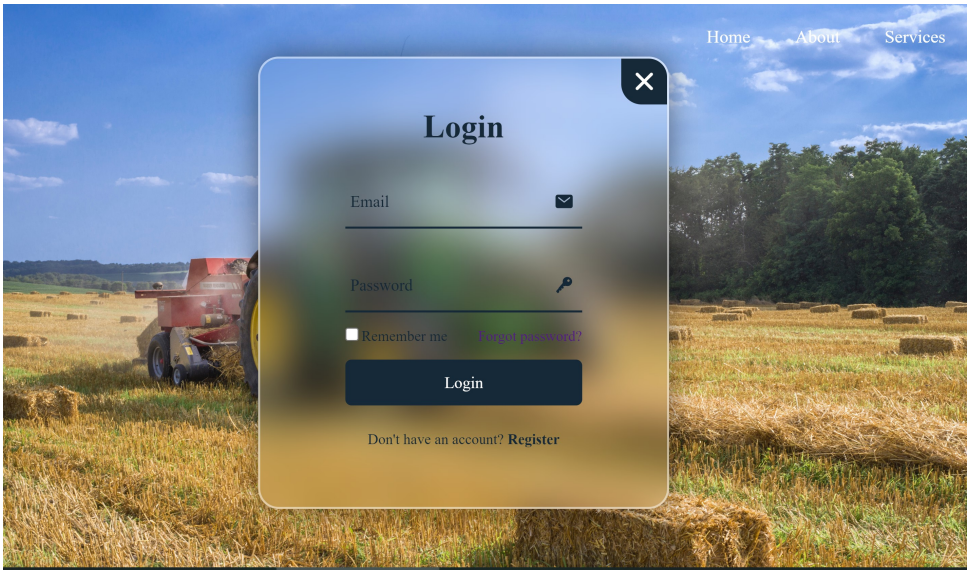


Figure 42: Log in Page

### 33.0.3 Supplier Dashboard

// Home

The "Home" interface of the Supplier Dashboard within the web application welcomes suppliers with a personalized greeting and provides a comprehensive overview of their account. The top section features a user-friendly header with a login/logout option and the application logo. A dynamic welcome message sets the tone, offering a friendly introduction to the logged-in supplier. Below this, a quick overview section gives the supplier a snapshot of their account status and any pertinent notifications. The main navigation options, presented as cards or a menu, include Dashboard, Products, Orders, Pricing, and Profile, offering easy access to essential features. Featured promotions and the latest updates are highlighted to keep the supplier informed about relevant activities on the platform. The interface prioritizes responsiveness and encourages user interaction through strategically placed calls to action, making it intuitive and visually appealing for suppliers to manage their tasks efficiently.

//Supplier Product

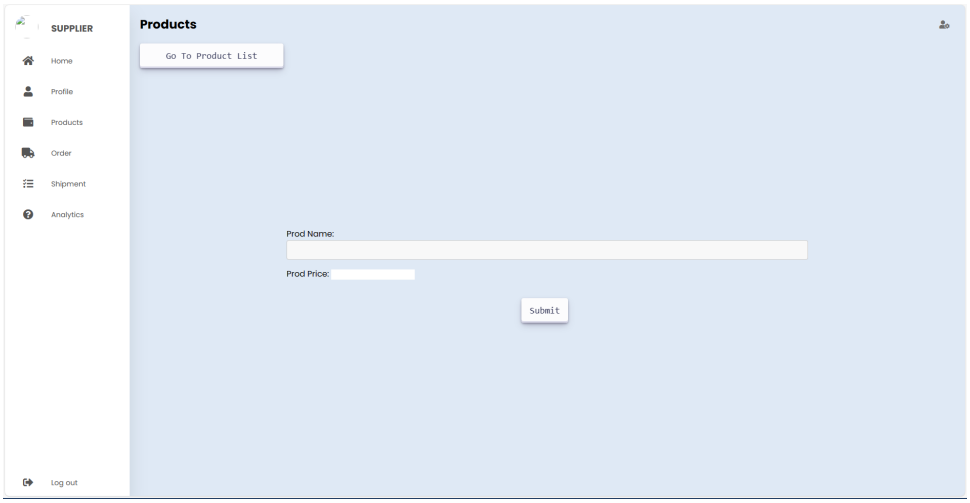


Figure 43: Product

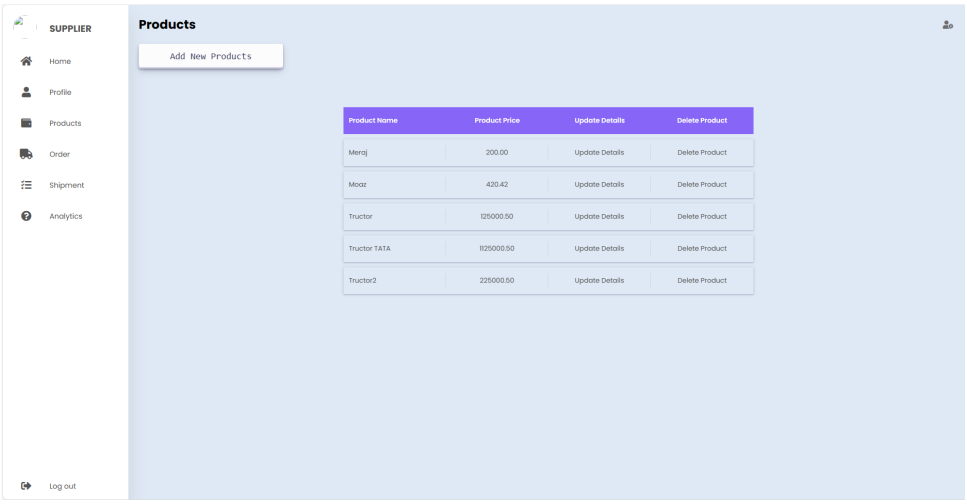


Figure 44: Product Table

The Supplier Dashboard offers a user-friendly "Product" interface, featuring a table displaying key product details for easy management. The "Order" interface streamlines order tracking with a comprehensive table showing order numbers, product information, and statuses. In the "Shipment" section, a well-organized table simplifies tracking by presenting shipment details such as tracking numbers and delivery dates. These interfaces maintain consistency with a welcoming header and login/logout option, ensuring an efficient and intuitive experience for suppliers managing products, orders, and shipments.

Product Query: SELECT productPrice, productName FROM YourTableName WHERE productID = yourProductIDValue;

ADD Product to database Query: INSERT INTO YourTableName (productPrice, productName) VALUES ( yourProductPriceValue, 'yourProductNameValue');

//Orders

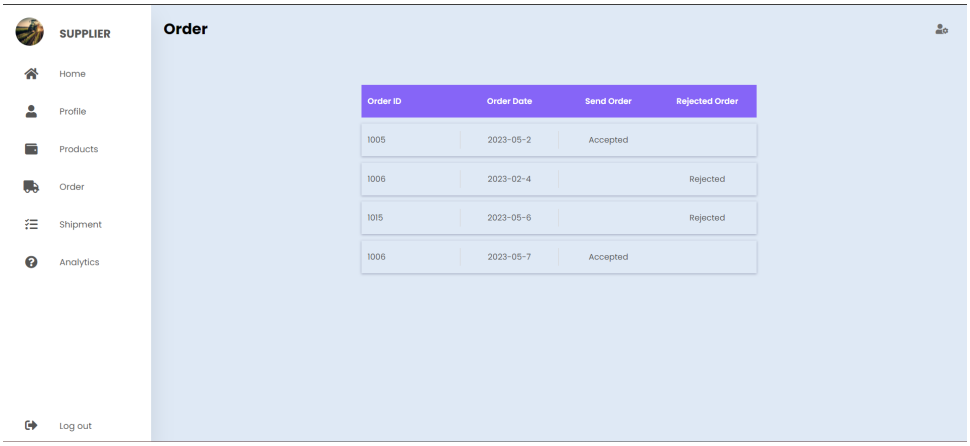


Figure 45: Order

Welcome to the Order Section of our website dashboard, the central hub for streamlined management of your orders. Within this dynamic and user-friendly interface, you'll find a comprehensive table that elegantly organizes crucial information for each transaction. Navigate effortlessly through the Order ID, ensuring a quick and efficient reference point for tracking and updates. Stay informed with the Order Date feature, providing a chronological overview of your transactions. Experience seamless control with the Send Order and Rejected Order sections, allowing you to manage and monitor the status of your orders with ease. This centralized and intuitive Order Section empowers you to take command of your transactions, providing a clear and organized platform for efficient order management.

Order Query: – Order by orderDate SELECT productID, orderDate, quantity FROM YourTableName ORDER BY orderDate;

// Shipment

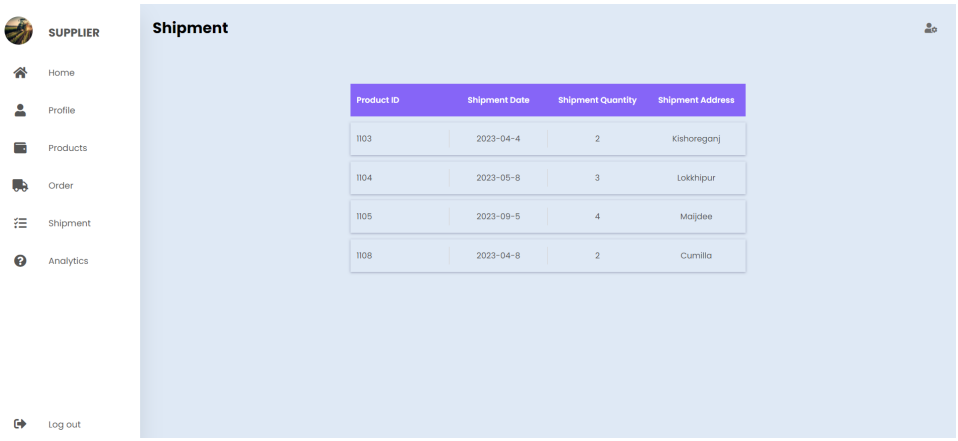


Figure 46: Shipment

Welcome to the Shipment Section of our website dashboard, your dedicated control center for overseeing the intricate details of product shipments. Navigating through this user-centric interface, you'll encounter a well-organized table designed to enhance your shipment management experience. The Product ID section serves as a unique identifier, ensuring precision in tracking and referencing your products. Stay up-to-date with the Shipment Date feature, providing a clear timeline for every dispatch. Manage quantities seamlessly with the Shipment Quantity section, offering a quick overview of the products being sent. The Shipment Address field ensures accurate delivery, giving you confidence in the logistical aspects of your operations. This comprehensive Shipment Section is tailored to simplify your logistics, offering a centralized and efficient platform for monitoring and controlling the shipment lifecycle.

Shipment Query: SELECT productId, shippingDate, shippingQuantity, shippingAddress FROM shipping$_{r}ecordsWHERE shippingDate >' 2023 - 01 - 01'$;

### 33.0.4 Farmer Dashboard

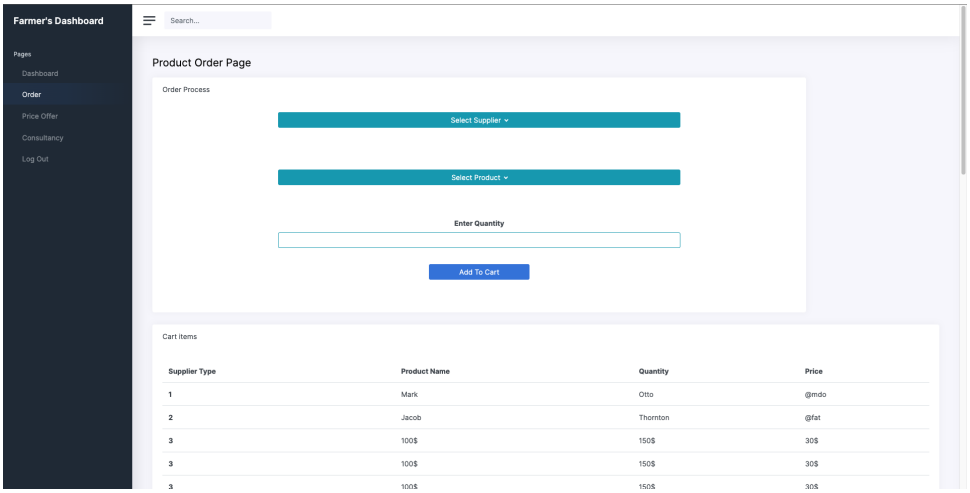


Figure 47: Order 1

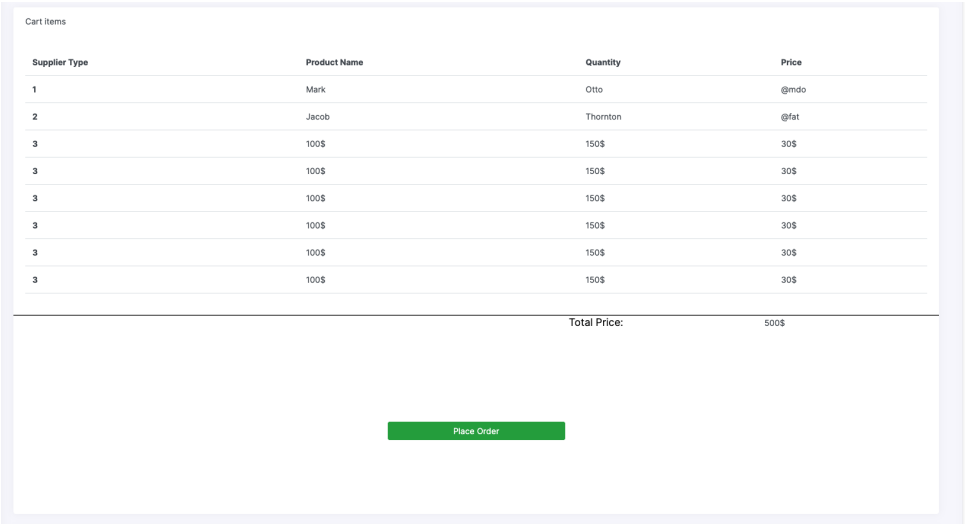


Figure 48: Order 2

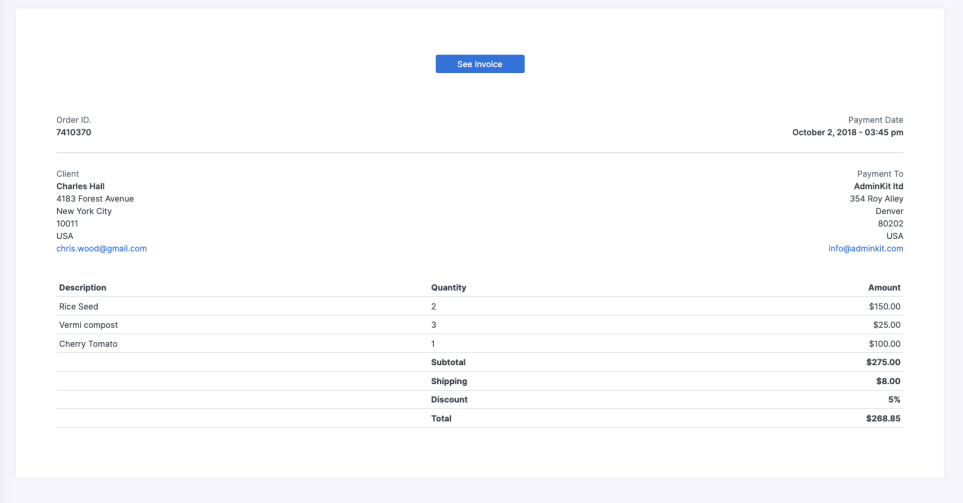


Figure 49: Order 3

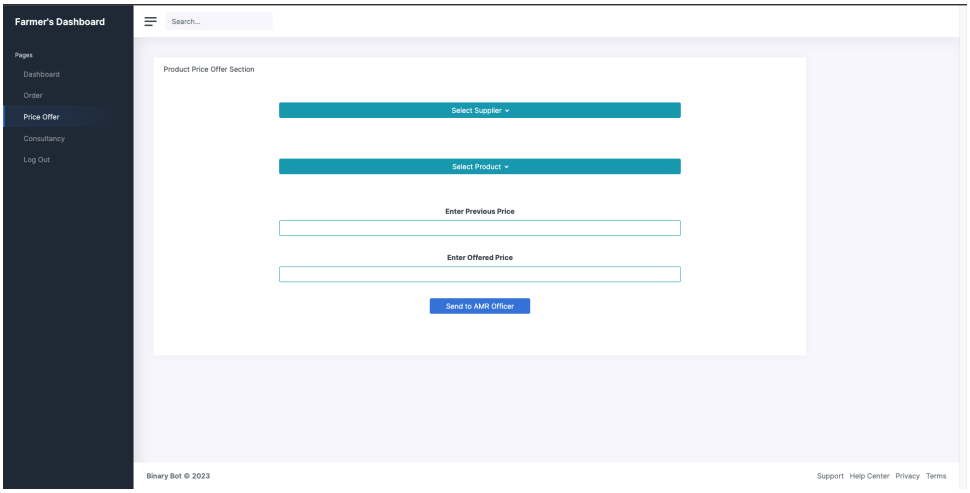


Figure 50: Price Offer

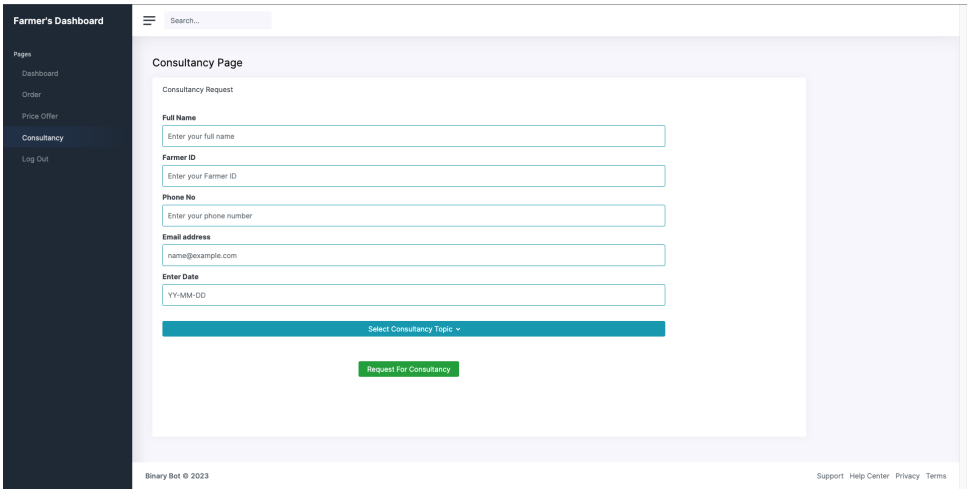


Figure 51: Consult Table

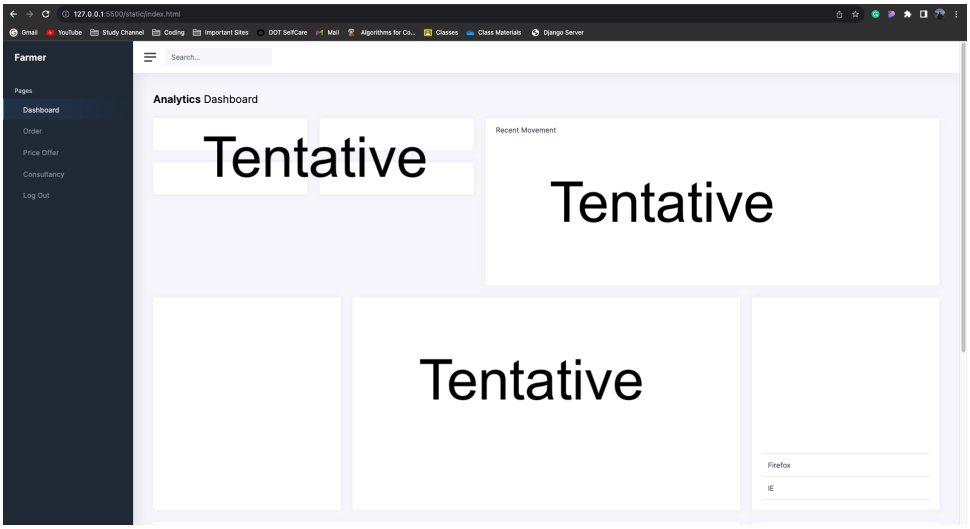


Figure 52: Analytics

The farmer's dashboard, crafted with HTML, CSS, Bootstrap, and minimal JavaScript, encompasses various sections. The "Order" section comprises an order process involving a dropdown for selecting from five suppliers, another for specific products, and an input field for quantity. Clicking "ADD TO CART" enables farmers to add products to a dynamically updated table, displaying supplier type, product name, quantity, and price. Confirming the order is achieved by clicking the "Place Order" button. The "Invoice" section allows farmers to view order details, including order ID, supplier and farmer information, along with products and total price. In the "Price Offer" section, farmers can communicate with the AMR Officer by selecting supplier types and products, entering previous and new offered prices, and sending an offer request with the "Send to AMR Officer" button. Lastly, the "Consultancy" section facilitates farmers' requests for assistance from the ARD Officer by providing personal information, selecting consultancy topics, and initiating requests through the "Request for Consultancy" button.

### 33.0.5 Agriculture Market Regulation Officer Dashboard

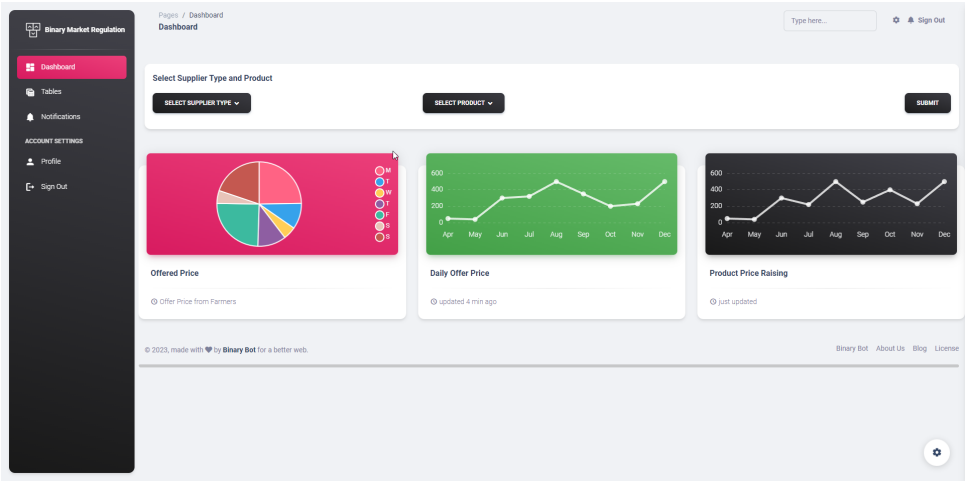


Figure 53: Market Regulation Dashboard

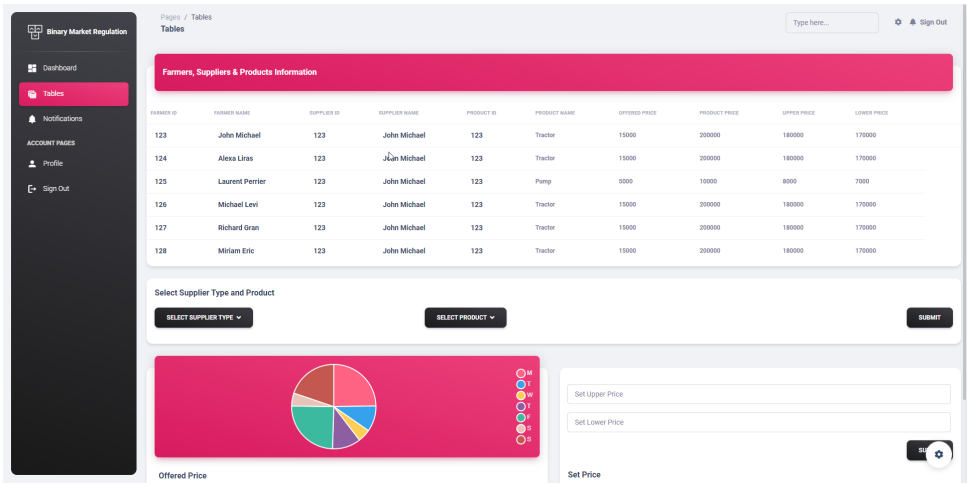


Figure 54: Market Regulation Table

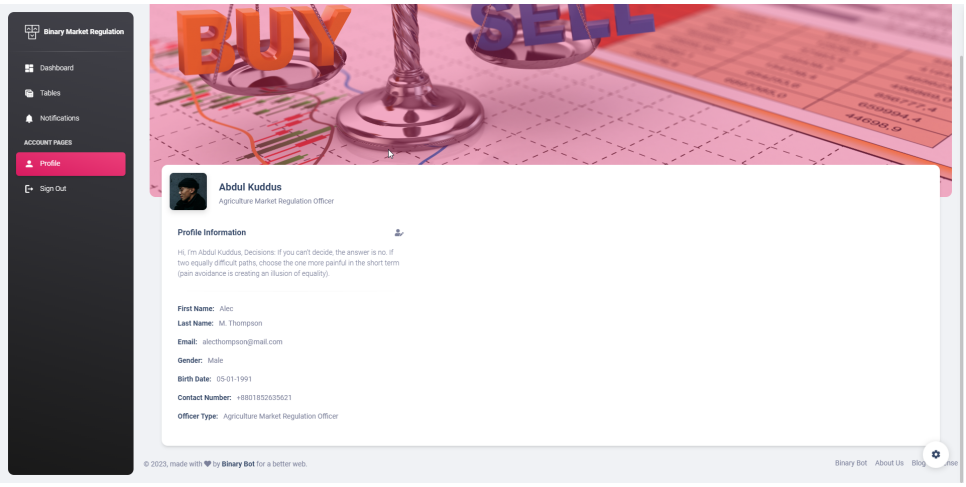


Figure 55: Market regulation profile

The provided HTML code establishes the front-end structure for the *Binary Market Regulation* web application. This application appears to be a dashboard tailored for managing market regulations, specifically in the agricultural sector.

## 33.1 Interfaces

### 33.1.1 Sidebar Navigation

The sidebar navigation is a crucial component providing quick access to different sections of the application. It features links to the following sections:

- Dashboard
- Tables
- Notifications
- Profile

### 33.1.2 Dashboard

The Dashboard interface is accessible through the sidebar. It likely contains analytical and statistical information related to market regulation in the agricultural domain.

### 33.1.3 Tables

The Tables interface, accessible through the sidebar, is expected to display tabular data relevant to market regulation or agricultural activities.

### 33.1.4 Notifications

The Notifications interface, accessible through the sidebar, is likely designed to showcase important alerts or updates related to market regulation.

### 33.1.5 Profile

The Profile interface, accessible through the sidebar, is designed to display user-specific information, possibly related to regulatory officers or individuals involved in agricultural market oversight.

## 33.2 Footer

The footer section of the web application includes copyright information and links related to Binary Bot. It serves as a standard footer providing essential details about the application and the organization behind it.

### 33.2.1 Agriculture Research and Development Officer Dashboard


Figure 56: Consult Table

**Bangladeshi Crop Calendar**

| Month | Main Crops |
|---|---|
| January | Rice, Wheat, Mustard, Potato |
| February | Rice, Wheat, Mustard, Potato |
| March | Rice, Jute, Sugarcane, Wheat |
| April | Rice, Jute, Sugarcane, Maize |
| May | Rice, Jute, Sugarcane, Maize |
| June | Jute, Sugarcane, Maize, Vegetables |
| July | Jute, Sugarcane, Maize, Vegetables |
| August | Jute, Sugarcane, Maize, Vegetables |
| September | Rice, Jute, Wheat, Vegetables |
| October | Rice, Wheat, Mustard, Vegetables |
| November | Rice, Wheat, Mustard, Vegetables |
| December | Rice, Wheat, Mustard, Vegetables |

Figure 57: Consult Table

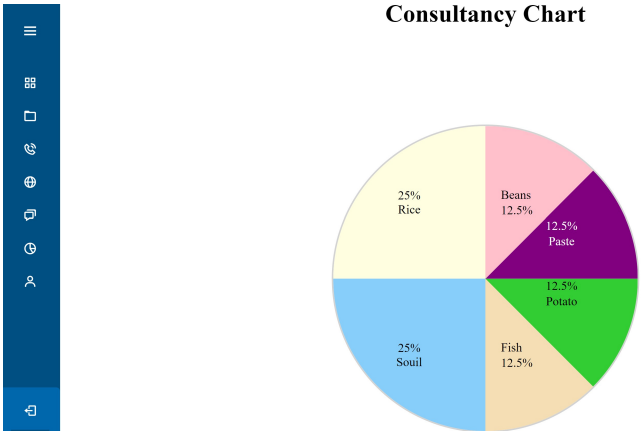


Figure 58: Consult Table


Figure 59: Consult Table

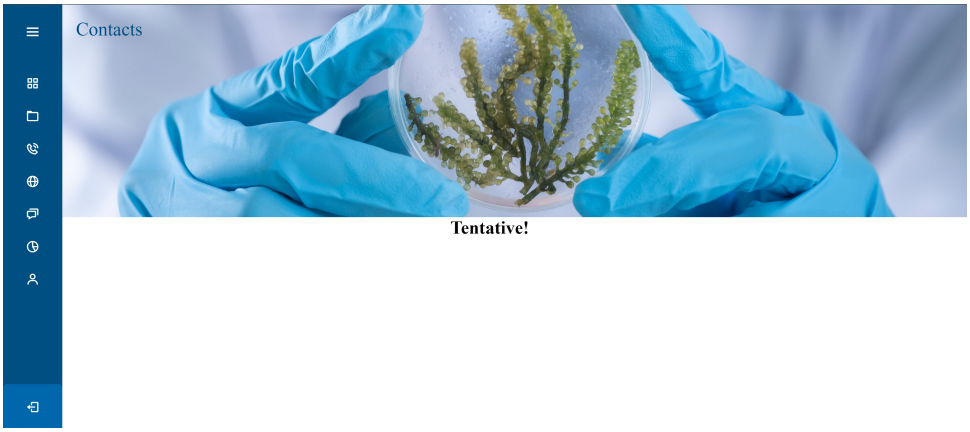


Figure 60: Consult Table

The provided HTML file represents the front-end structure of a web application for Binary Consultancy. The webpage is designed to offer various functionalities through a sidebar navigation system and a main content area.

## 33.3 Interfaces

### 33.3.1 Sidebar Navigation

Features a collapsible menu triggered by the menu icon (`bx-menu`). Includes links to different sections of the application:

Analytics Dashboard

File Manager

Contacts

Research News

Message

Financial Planning

User Profile Displays the user's profile details (name and designation) and a logout option.

### 33.3.2 Main Content Section

Consists of a home-section displaying "Analytics Dashboard". Presents a "Consultancy Chart" with categorized entries and percentage values for various items (Rice, Soil, Beans, Paste, Potato, Fish). Initially, there are divisions for different entries with different colors.

### 33.3.3 File Manager Section

Contains a table presenting farmer data. Each row represents a farmer's details:

Farmer ID

Farmer Name

Email

Consult Product

Consultancy Date

Status (Accepted/Rejected) with checkboxes for each status option

Edit and Delete buttons for each entry Shows placeholders for additional data ("More Data 1" to "More Data 7").

#### 33.3.4 Farmers Data Section

Indicates the title "Farmers data."

#### 33.3.5 News Section

Displays the title "News."

#### 33.3.6 Bangladeshi Crop Calendar Section

Presents a table showcasing the crop calendar for each month in Bangladesh. Lists main crops for each month of the year.

#### 33.3.7 Planning Section

Indicates the title "Planning."

#### 33.3.8 Financial Tools

**Budget Calculator** Provides fields to input total income and total expenses. Displays the calculated budget based on the provided values.

**Expense Tracking** Offers fields to input expense type and amount. Lists the entered expenses.

### 33.4 Functionalities

#### 33.4.1 Sidebar Navigation

Allows quick access to different sections of the application. Provides a responsive design suitable for various device sizes.

#### 33.4.2 Consultancy Chart

Illustrates categorized entries with percentage values using different colored divisions. Potentially interacts with user actions (like clicking an entry) based on commented-out radio button elements.

#### 33.4.3 File Manager Table

Displays farmer details in a tabular format. Allows editing and deletion of farmer data through respective buttons. Incorporates checkboxes for changing the status of each farmer entry. The provided HTML showcases a static representation of a file manager section with placeholder data. The functionality of editing, deleting, and updating the farmer data might require JavaScript or server-side interaction, not present in this snippet.

### 33.4.4 Bangladeshi Crop Calendar Table

Provides a structured view of crops grown in different months. Allows users to understand the main crops cultivated in Bangladesh each month. The provided HTML demonstrates a static representation of agricultural news and a crop calendar. The functionalities are limited to displaying information and may require backend interactions or additional JavaScript for dynamic updates or user interactions.

The table showcases crop data for several months, indicating the main crops cultivated during those periods in Bangladesh.

### 33.4.5 Budget Calculator

Calculates the budget based on the inputted income and expenses. Reflects the calculated budget value in real-time.

### 33.4.6 Expense Tracking

Allows users to input and track different types of expenses. Lists the entered expenses in a specified section. The provided HTML file demonstrates a basic representation of financial tools related to agriculture. The functionalities are static and would require additional JavaScript or backend interactions for dynamic calculations or data storage.

### 33.4.7 Footer

Contains copyright information ("© 2023 Binary Bot. All Rights Reserved.") and a horizontal line as a separation.

### 33.4.8 Farmer