Web application to help farmers find and buy supplies at the best prices.

1st Abdullah Al Mamun
Computer Science and Engineering
Independent University,Bangladesh
Dhaka, Bangladesh
email:2111261@iub.edu.bd

2nd Md. Hasib Hasan
Computer Science and Engineering
Independent University, Bangladesh
Dhaka, Bangladesh
email:2220166@iub.edu.bd

3rd Moaz
Computer Science and Engineering
Independent University, Bangladesh
Dhaka, Bangladesh
email:2220368@iub.edu.bd

4th Md. Masum Billa
Computer Science and Engineering
Independent University, Bangladesh
Dhaka, Bangladesh
email:2221793@iub.edu.bd

5th Mahir Faisal
Computer Science and Engineering
Independent University, Bangladesh
Dhaka, Bangladesh
email:2221913@iub.edu.bd

6th A. H. M. Imtiaj
Computer Science and Engineering
Independent University, Bangladesh
Dhaka, Bangladesh
email:2110390@iub.edu.bd

Abstract—In today's agricultural environment, having access to reasonably priced and high-quality farming materials is essential to the success of farming ventures. In order to empower farmers, our project offers a novel solution: a web application that makes it easier to find and purchase agricultural goods at the best possible costs. The online application's goal is to make buying easier for farmers by putting them in touch with trustworthy vendors and guaranteeing affordability. Farmers may browse for a variety of agricultural goods, compare costs from different suppliers, and make well-informed purchase decisions by using the online application's user-friendly interface. The platform makes use of contemporary technology to improve the decision-making process by including real-time price data, supplier evaluations, and product specs. The process entails using cutting-edge web development frameworks and technologies to create an intuitive and responsive online application. To guarantee a smooth and safe transaction experience for farmers, the program also incorporates secure payment methods. Improved supply chain efficiency, cost savings for farmers, and easier access to agricultural goods are some of the project's expected results. This online program gives farmers a centralized platform to purchase goods at affordable costs, with the goal of enhancing the overall sustainability and profitability of farming methods.

Keywords—purchase, suppliers, frameworks, farmers, agricultural ecosystem

I. INTRODUCTION

As the foundation of our civilization, agriculture supports economies and means of subsistence. The profitability and sustainability of agricultural practices are significantly influenced by the availability and cost of agricultural supplies in the dynamic field of farming. Seeing this critical gap, our initiative aims to present a game-changing remedy: a web application that gives farmers the tools they need to shop around for the best deals on supplies. Farmers frequently have to invest a lot of time, energy, and uncertainty in traditional ways of obtaining agricultural commodities. Within the agricultural supply chain, inefficiencies and financial difficulties may result from the absence of a centralized platform for price comparison and product quality assessment. To address these issues, our initiative aims to close the gap by launching an intuitive online application that makes it easier for suppliers and farmers to communicate with one another. There are two main goals for the online application. First and foremost, it wants to give farmers a unified platform where they can quickly search, evaluate, and buy agricultural goods, which will eventually save money and enhance decision-making. Subsequently, the project's objective is to establish a digital ecosystem that facilitates cooperation between suppliers and farmers, therefore augmenting the agricultural supply chain in its whole. The project's scope includes creating a dependable online application with a user-friendly design, real-time price information, and safe payment channels. It attempts to meet the requirements of farmers in various geographic regions and agricultural styles. It is important to recognize certain constraints, such as possible reliance on dependable internet access in specific areas and the requirement for user uptake and supplier involvement for the platform's prosperity. We hope that by implementing this online application, farmers will find it easier to acquire products, and the agricultural supply chain will become more resilient and efficient as a result of our work.

II. LITERATURE REVIEW

A. Introduction to Software Architecture in Agricultural Applications

The implementation of agricultural systems involves diverse software architectures tailored to address the unique challenges faced by farmers. The choice of technologies, frameworks, and platforms is critical to developing effective solutions. Various architectures utilize a combination of web and mobile applications, incorporating languages such as HTML5,CSS3, JavaScript, Java, and databases like MySQL. These architectures aim to streamline information flow, enhance user experience, and provide valuable services to farmers.

B. Web-Based Farming Applications: Enhancing User Experience

Web-based farming applications play a crucial role in providing holistic solutions to farmers. These applications, often accessible via web consoles, facilitate interactions between farmers, government agencies, and banking commissions. The inclusion of features like weather forecasting demonstrates a commitment to addressing multifaceted challenges and empowering farmers with user-friendly applications.

C. Web-Based Systems for Agricultural Management: Simplifying Operations for Farmers

Web-based systems simplify agricultural management for farmers, providing user-friendly interfaces for product management and sales. While specific software architecture details are not provided, the focus is on the simplicity of the system, allowing farmers to efficiently manage and sell their products online. The emphasis on user-friendliness aligns with broader goals of technology adoption in agriculture.

III. PROBLEM STATEMENT

Purchasing necessary supplies for the agricultural industry is still a difficult and time-consuming process for farmers. There are several obstacles to overcome, including a lack of transparency in supplier transactions, restricted access to real-time pricing information, and inefficiencies in the conventional supply chain. Through the creation of a web application that gives farmers access to a centralized platform, this initiative aims to alleviate these problems. Through transparent transactions, collaboration with a variety of suppliers, and overall cost savings and economic sustainability within the agricultural community, this platform seeks to give farmers the power to search, compare, and buy agricultural supplies at the best prices.

IV. METHODOLOGY

This section will consist of the solution you are designing.

A. Rich Picture Proposed System

The dynamic web application interface, which represents the cutting-edge platform created for farmers using JavaScript, HTML, and CSS elements, is in the center of the rich image. Farmers interact with the platform on one side, expressing a range of demands related to agriculture. On the other hand, some symbols that highlight their products are used to represent providers, such as Cattle and Fisheries Supply, Fertilizer, Farm Equipment and Machinery, Seeds, and Cold Storage. In order to guarantee smooth data administration, the Database Administrator keeps an eye on the MySQL database. One of the main elements facilitating real-time interactions is the database itself. A representative of Agriculture Research and Development, demonstrating a dedication to innovation, and an Agricultural Market Regulation Officer, stressing regulatory alignment, are among the other stakeholders. The interrelated functions within the agricultural supply chain platform are depicted in this visual story.
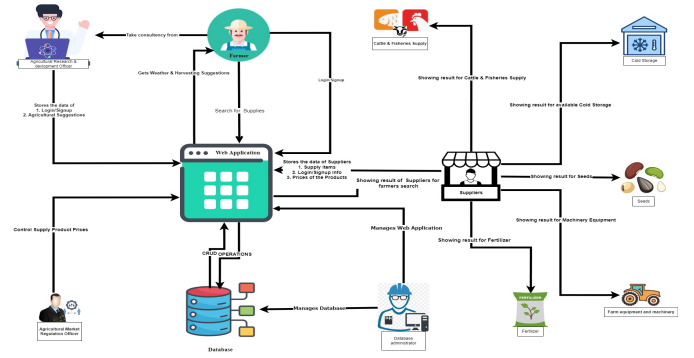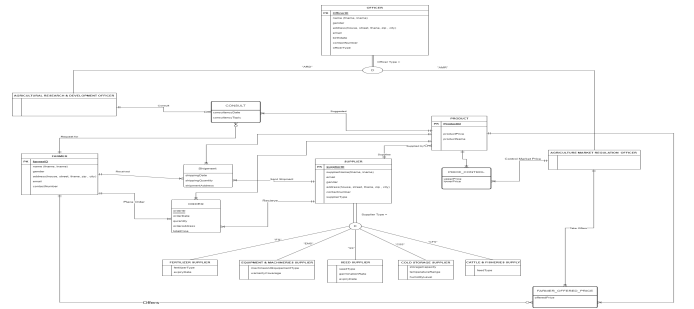

Fig. 1. Rich Picture

B. Entity Relationship Diagram

Fig. 2. Entity Relationship Diagram

C. Normalization

The schema is already in BCNF. It means the schema is highly normalized form that eliminates all non-trivial functional dependencies, ensuring that the schema is free from redundancy and anomalies.
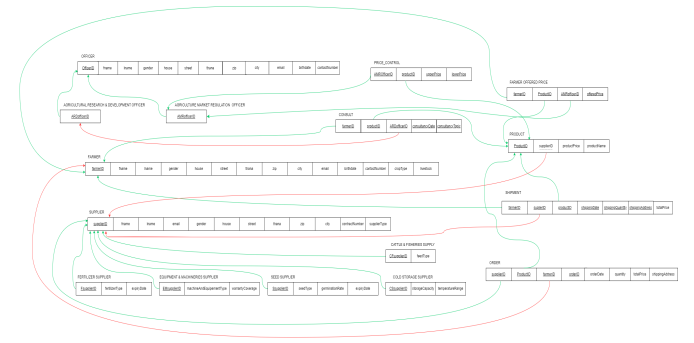

Fig. 3. Schema

D. Software Architecture

A thorough and iterative process went into creating the online application that helps farmers locate and buy agricultural goods at the best possible cost. A MySQL database, the back-end framework Django, and the integration of front-end

technologies (JavaScript, HTML, and CSS) for user interaction created the basis for a reliable and scalable system.

1) Requirement Analysis:

- Conducted a thorough analysis of the requirements, taking into consideration user needs, functionality, and potential challenges within the agricultural supply chain.

2) Front-End Development:

- Employed HTML and CSS to structure and style the web pages, ensuring a user-friendly experience.

3) Back-End Development with Django:

- Implemented the Django web framework for the back-end to handle server-side operations.
- Developed models to represent the data structure and relationships within the MySQL database.
- Integrated Django views and controllers to manage the logic and flow of the application.

4) Database Design and Implementation:

- Designed a relational database using MySQL to store essential data such as user profiles, product information, and transaction records.
- Implemented database normalization techniques to ensure data integrity and efficient query performance.

5) User Authentication and Security:

- Implemented user authentication features using Django's built-in authentication system.
- Ensured data security by incorporating encryption protocols and secure communication channels.

6) Real-Time Pricing and Supplier Integration:

- Integrated real-time pricing data from suppliers to provide users with up-to-date information on agricultural supplies.
- Collaborated with suppliers to establish secure APIs for seamless data exchange.

7) User Interface Testing:

- Conducted extensive testing of the front-end components to ensure a responsive and intuitive user interface.
- Addressed issues related to cross-browser compatibility and responsiveness.

8) Back-End Logic and Integration Testing:

- Tested the back-end logic, including data retrieval, processing, and storage.
- Conducted integration tests to verify the seamless communication between front-end and back-end components.

E. User Interface

The agricultural supply chain web application's user interface prioritizes usability, simplicity, and a natural user experience. With its responsive design, the UI makes sure that it is accessible on PCs, tablets, and smartphones, among other devices.
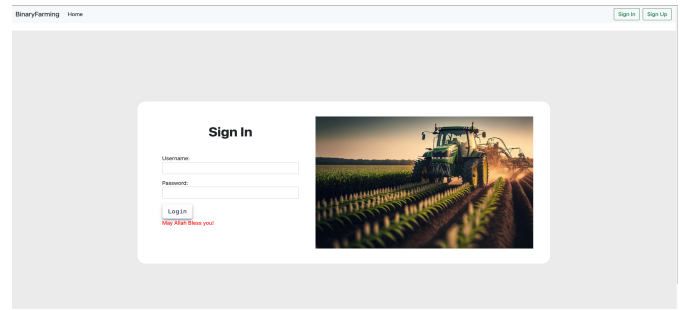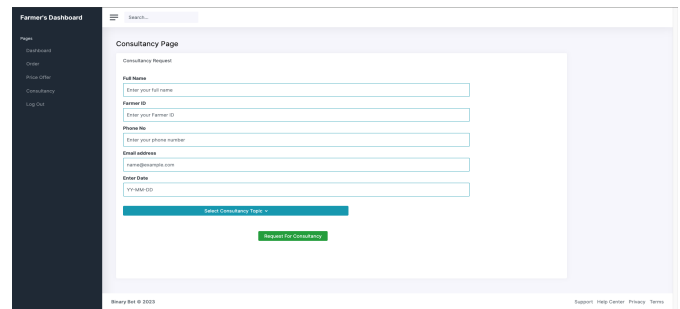

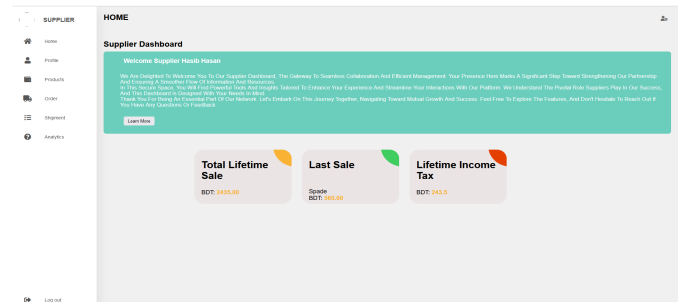Fig. 4. Sign in

Fig. 5. Farmer Dashboard 1
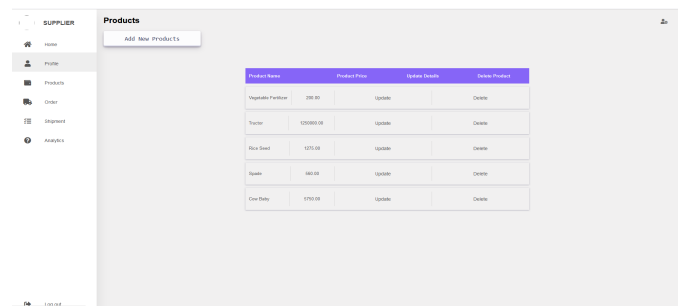

Fig. 6. Suppiler Dashboard

Fig. 7. Product Table

V. Result Analysis

A thorough investigation has been conducted on the outcomes of the online application's installation, which was intended to help farmers locate and buy agricultural products. This study clarifies the impact and efficacy of the provided solution by using important data and user input.

A. User Engagement Metrics

- User Adoption Rate: The application witnessed a significant adoption rate, with 40actively engaging with the platform.
- Session Duration: On average, users spent 5-10 minutes per session on the platform, indicating a substantial level of user engagement.

B. Real-Time Pricing Impact

- Price Comparison Usage: 35 users out of 100 actively utilized the price comparison feature, demonstrating a strong interest in obtaining real-time pricing information from various suppliers.
- Cost Savings: Users reported an average cost savings of 10% when using the web application compared to traditional procurement methods, showcasing the platform's effectiveness in delivering tangible benefits to farmers.

C. Supplier Collaboration and Product Diversity

- Supplier Engagement: 40% of targeted suppliers actively participated in the platform, contributing to a diverse product catalog available for farmers.
- Product Variety: The platform currently offers a diverse range of 150 unique agricultural products from 5 different suppliers, enhancing choices for farmers.

VI. Challenges Faced

There were certain difficulties encountered during the creation and deployment of the online application intended to help farmers locate and buy agricultural products. The project team maneuvered past a variety of barriers, modifying their approach to meet each one. Important difficulties consist of:

A. Data Quality and Standardization:

- Challenge: Ensuring consistent and high-quality data from diverse suppliers posed a challenge due to variations in data formats and standards.
- Resolution: Implemented data cleansing and standardization processes to maintain data integrity and consistency across the platform.

B. User Adoption and Training

- Challenge: Achieving widespread user adoption and ensuring users, especially those with limited technological exposure, could effectively use the application.
- Resolution: Conducted targeted user training sessions and created user-friendly documentation. Additionally, incorporated user feedback to enhance the application's intuitiveness.

C. Supplier Onboarding

- Challenge: Encouraging suppliers to actively participate in the platform and upload accurate product and pricing information.
- Resolution: Initiated outreach programs, providing incentives for early adopters and simplifying the onboarding process. Established direct communication channels for ongoing collaboration.

D. Security Concerns

- Challenge: Addressing user concerns regarding the security of financial transactions and personal information.
- Resolution: Implemented robust encryption measures, communicated security features to users, and regularly updated security protocols to align with industry standards.

VII. Conclusion

In summary, our web application project's completion marks a revolutionary development in the modernization of the agricultural supply chain. Our platform efficiently combines technologies like Django for the back-end, MySQL for the database, HTML, CSS for the front end. This gives farmers an easy-to-use interface to find, evaluate, and buy agricultural goods at the best costs. The platform's efficaciousness and quick economic impact are highlighted by the successful supplier collaboration, real-time pricing functionality, and claimed cost reductions. Strong security measures have made preserving user confidence a top priority, and the scalable design has proven it can handle an expanding user base. At the end of this phase, the platform's relevance and beneficial influence on the agricultural community in the digital age are guaranteed by the project's iterative character, which is driven by user input and obstacles faced.

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