

Research Article

Development of an Online Farm Produce Marketing System (A Case Study of Yusroh Farms)

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Abstract

Advancements in agricultural technologies have demonstrated promise in enhancing the management of agricultural practices. In many regions, traditional agricultural practices face challenges in accessing broader markets due to logistical, informational, and infrastructural barriers. This awareness has attracted researchers to develop technologies to create a direct and efficient connection between Farmers growing different types of crops and raising various agricultural products, consumers seeking fresh, locally sourced goods. This paper developed a user-friendly interface accessible via a web platform, where farmers can showcase their produce with detailed descriptions, pricing, and availability. Customers can browse available products, place orders, and arrange for delivery or pick-up directly from the farmers or designated distribution points. The implementation of the web-based system was carried out using C# (c sharp programming language), HTML (Hypertext Mark-up Language), CSS (Cascading stylesheet), JavaScript, Bootstrap and Microsoft SQL (MSSQL). The research work aims to empower farmers economically by expanding their market reach and providing fair pricing opportunities. Simultaneously, it seeks to offer consumers access to fresher, healthier produce while supporting local agricultural communities. The final result of this project is the web application which is used to manage the farmer's income and improve their management.

Keywords

Marketplace, Farmers, Buyers, Agricultural, Product, HTML, CSS, Microsoft SQL

1. Introduction

Agriculture often considered the backbone of civilization, is pivotal in sustaining the world's growing population by providing food, fibre, and fuel. This age-old practice has evolved from simple manual techniques to highly mechanized and technologically advanced methods, increasing productivity and efficiency. By 2050, the global population is esti-

mated to reach 9 billion people; the demand for agricultural products is soaring, underscoring the significance of this sector. One of the primary objectives of agriculture is to address the ever-growing challenge of food security. A steady and sufficient food supply becomes paramount as the global population expands. Sustainable agricultural practices, in-

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Received: 5 August 2024; **Accepted:** 9 September 2024; **Published:** 25 December 2024



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corporating precision farming, agro-ecology, and advanced technologies, are essential to maximize crop yields while minimizing environmental impact [8].

The agriculture sector in Nigeria is considered a major contributor to economic growth and development. This sector not only meets the population's food demands but also provides raw materials for industry and a surplus for exports. Even though the agricultural sector has witnessed many high and low points in recent years, overall growth has remained satisfactory [10]. This sector has significant potential to bolster the nation's economy both presently and in the future, provided there is adequate attention given to resolving emerging issues. Sustainable agricultural growth and advancement hinge on addressing the concerns of various stakeholders, particularly farmers who face numerous risks in production and marketing of their crops. Farmers often experience reduced value in their produce due to inadequate infrastructure and post-harvest practices. Additionally, addressing the frequent fluctuations between food surpluses and shortages underscores the necessity to modernize the marketing system framework to effectively manage such scenarios. Agriculture is not only about cultivating crops but also about sustaining livelihoods and communities. In numerous regions worldwide, particularly in developing nations, agriculture serves as the main source of income for millions of individuals. Empowering smallholder farmers with access to education, technology, and markets can lift them out of poverty, fostering economic development and social stability. Additionally, supporting gender equality in agriculture ensures that women, who often play a significant role in farming, have equal access to resources and opportunities.

Agricultural product marketing plays a crucial role in the success of farmers and agribusinesses. Effectively bringing agricultural products to market requires a comprehensive understanding of the industry, consumer demands, and strategic marketing technique [11]. It plays a central role in assembling rural agricultural produce from scattered and vast production areas and distributing these commodities further to consumers and other stakeholders in urban and peri-urban areas. Agricultural marketing most times encompasses activities which may be picking/harvesting, drying, cleaning, sorting, grading, processing, packaging, labeling, transporting, storage, promotion, and sale of agricultural products. All these major activities add value to agricultural products as these products flow from farm producers to consumers. While some major activities are performed on farmers' farms, others are carried out off-farm by other market intermediaries such as traders and agro-processors. In common understanding, the conventional market can be defined as a place to trade goods and services, between sellers and buyers, from producers to consumers, to fulfill their individual needs. There seems to be a problem that arises in the conventional market: market distance, limited time, differences in commodities between markets, and other problems that have an impact on sellers and buyers. It has a limited time for transactions and marketing by producers or sellers. Therefore, it needs a way out as

the solution to the conventional market's change in the sales system [2]. Marketing for agriculture not only increases production and consumption but also quickens the pace of economic development [14]. Safar H. Al-Khatano et al. have detailed a number of issues pertaining to the challenges the Kingdom's agriculture sector is facing. They also addressed the Kingdom's requirement for an agricultural marketing information system [12]. The government has taken a number of actions to defend and preserve farmers' interests. In the absence of accurate and timely market information and advice about arrivals, pricing, market trends, etc., farmers are unable to plan their strategy for selling their produce at competitive rates; therefore the advantages are still not trickling down to them [15]. One way to deliver extension services is through MIS. Lower yields and profit margins, crop diseases, insect and pest attacks, inadequate marketing facilities, limited water availability, and unfavourable soil conditions are just a few of the farming problems that extension may assist in addressing. Extension can undoubtedly provide practical answers and support farmers in their efforts to practise sustainable agriculture [13].

The advent of modern technology has revolutionized agriculture, introducing innovations such as precision farming, genetically modified organisms (GMOs), and drone-assisted crop monitoring. These technologies enable farmers to optimize resource utilization, keep track of crop health and make well-informed decisions for enhanced productivity [4]. Furthermore, integrating artificial intelligence and data analytics is transforming traditional farming into a data-driven, precision-based industry, fostering sustainable practices and resource efficiency. Another vital application of technology in agriculture is implementing an e-marketplace. Based on the previous explanation, the e-marketplace makes a new style of transaction form that has a more dynamic side, where customers can search and purchase goods from many sellers and make payment transactions easily. Also, there are features to facilitate users and their implementation with the internet, where buyers and sellers do not need to interact face-to-face. Moreover, traditional agricultural supply chains often involve multiple intermediaries, leading to increased costs and reduced profits for farmers. The advent of technology offers an opportunity to create a platform that directly connects farmers with buyers, streamlining the process and benefiting both parties. In the modern era, digital marketing is pivotal in reaching a wider audience.

By utilizing online platforms, social media, and e-commerce websites, farmers can improve the visibility of their agricultural products. Studies demonstrate that those who embrace digital marketing tools often see higher sales and improved interaction with consumers [5]. In today's world, marked by significant challenges such as climate change, population growth, and resource scarcity, the agricultural sector must continue to adapt and innovate. Sustainable farming practices, precision agriculture, and biotechnological advancements hold promise for meeting future demands. However, addressing issues such as equitable access to resources, fair trade practices, and ethical considera-

tions in technology adoption are crucial for building a resilient and inclusive agricultural future.

Existing literature primarily focuses on general e-commerce principles and platforms, often overlooking the intricacies of agricultural supply chains, seasonal fluctuations, perishability of produce, and the diverse needs of farmers and buyers in this domain [9]. Additionally, contextual factors such as varying agricultural practices, regulatory frameworks, and socio-economic conditions across different regions further complicate the development of effective digital marketplaces for farm produce. Addressing this research gap is crucial for informing the design and development of digital marketplaces that can effectively connect farmers with buyers, streamline transactions, improve market transparency, ensure fair pricing, and promote sustainability in agriculture. Moreover, understanding the unique challenges and opportunities in this domain can pave the way for innovative technological solutions, business models, and policy interventions tailored to the agricultural sector, ultimately contributing to the resilience and competitiveness of the farming community in the digital age.

2. Related Works

This author develops a basic online marketing system where business goods and ventures can advertise their goods and business ventures and sell seamlessly [1].

These authors focused on the specific context of Sub-Saharan Africa, this review explores how digital innova-

tions empower smallholder farmers. The paper discusses the role of digital marketplaces in connecting farmers to buyers, reducing information asymmetry, and fostering more inclusive and sustainable agricultural practices [3].

This author reviews of the contributions of farmers' organizations to smallholder agriculture. This paper highlights areas for improvement, particularly in supporting crop productivity and quality, as well as the need for targeted interventions for marginalized farmers [6].

This author examines the impact of e-commerce platforms on agribusiness in China, offering insights into the factors influencing farmers' adoption of digital marketplaces. The research highlights the positive effects of digital platforms on market access, price transparency, and efficiency in agricultural transactions [7].

This author proposes an Android Application for Marketing Agricultural Base Product Android on android devices that can provide information on agricultural products, facilitate farmers to market their agricultural products, and facilitate farmers to conduct direct transactions with consumers [5].

3. Methodology

This research was implemented using C# (c-sharp) programming language for coding, HTML for the markup, CSS for the styling, JavaScript for front-end scripting, Bootstrap for front framework, Microsoft SQL (MSSQL) for database management and entity framework For Query Execution

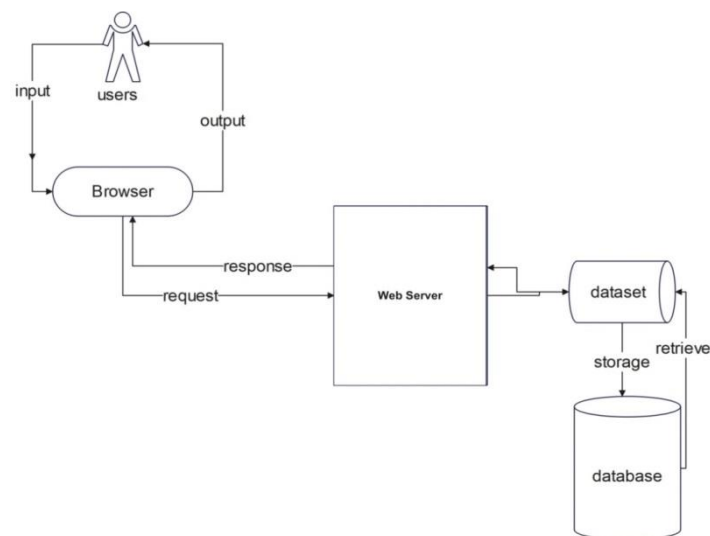


Figure 1. System Architecture.

Architectural Diagram

An architectural diagram is like a map that shows how a system is structured. It uses pictures and arrows to explain the parts of the system, how they connect, and how they work

together. These diagrams help people see the big picture of how everything fits together and guides how the system will be built.

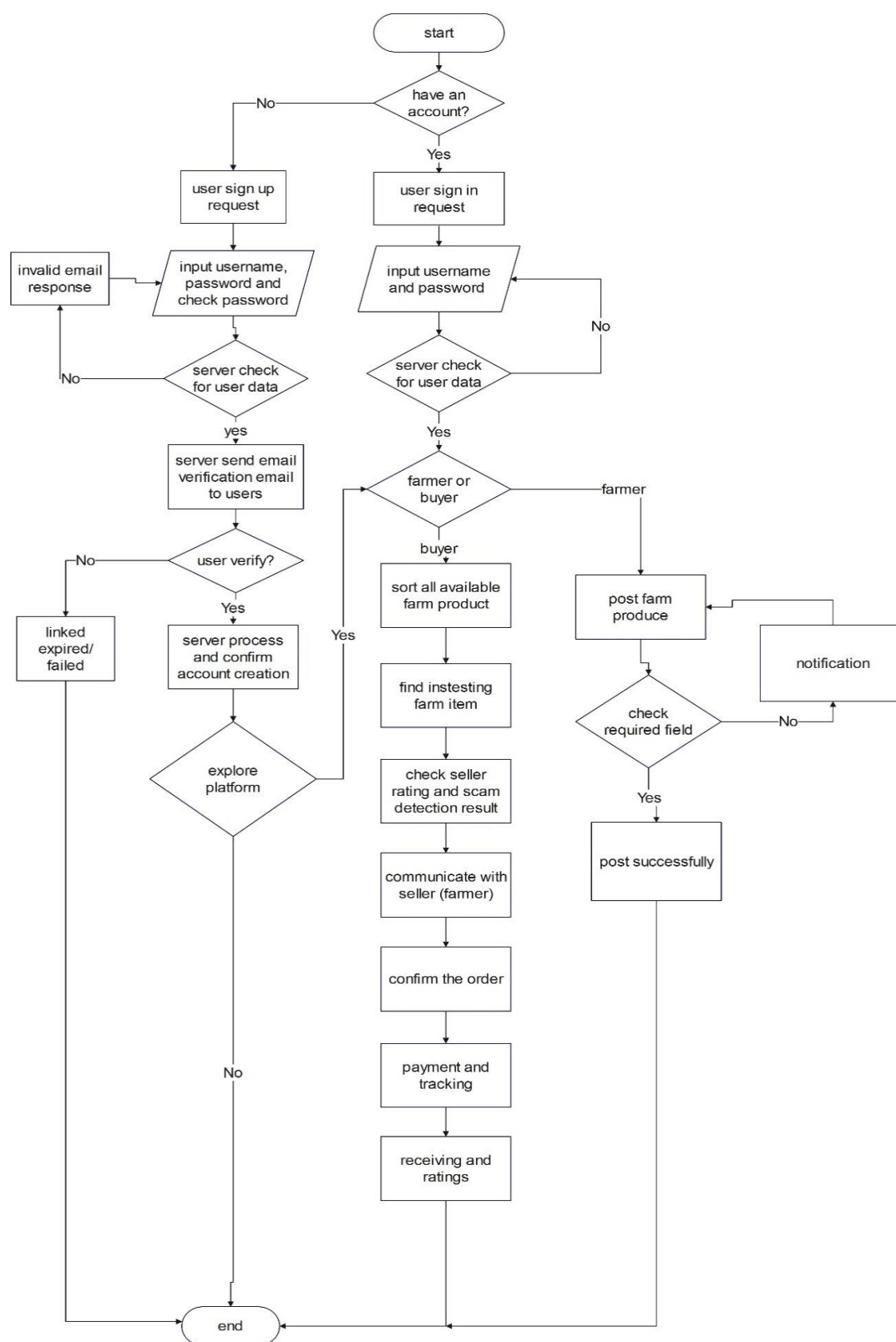


Figure 2. System Flowchart.

Application Flowchart

A system flowchart is a picture that explains the order of steps or actions in a system or software program. It uses symbols to show how information moves through the system, including where data comes in, how it's processed, and where

it goes next. Flowcharts are helpful for understanding how things work inside a system, finding problems, and making improvements to how it operates. The user sig in by inputting all the necessary information if they have an account or else create and account and wait for approval from the admin.

After approval, the user as a buyer, farmer and admin can perform any activities shown on the website.

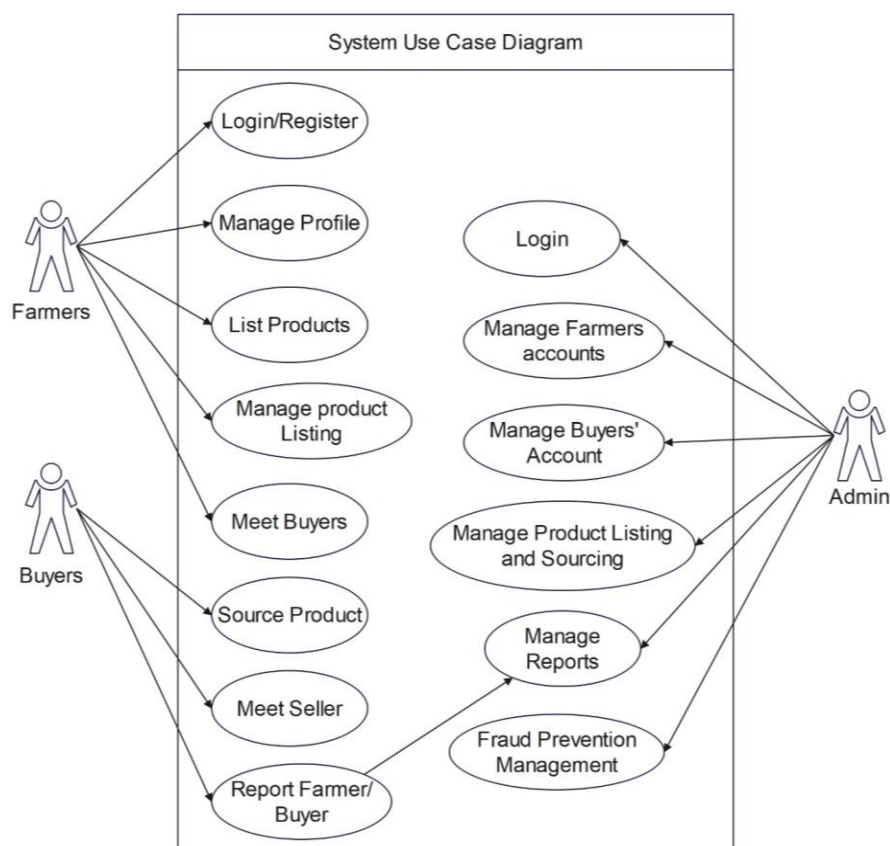


Figure 3. Use case Diagram.

Use case Diagram

A use case diagram is a way to show how people or other systems interact with the system. It uses boxes to represent different actions or goals that users might have, and lines to show who does what. This diagram helps designers and users understand what the system is supposed to do and how people will use it to get things done. There are three users here which are: farmers, buyers and the admin.

4. Result and Discussion

After implementing the system, system testing was performed to see if all the system's functionalities were working as expected. There are three users which are the farmer, buyer and the admin. The Farmer will register if he/she does not have an account before but if otherwise he/she will click on the log-in and input information so that they can have access to be able to upload product and meet with their interested buyers. The buyer will only input the product they are looking for and if it is available they will see the picture of the product and the price, if they are okay with it, they will arrange for delivery and knows how it will get to them. The admin will serve as a middleman between the farmer and the buyer and will also be the one to accept farmer's request.

5. Conclusion and Recommendation

The farmer and buyer system is another computing application in enhancing the agricultural and food security sector. The system makes it clear and straightforward for buyers to connect with farmers with the product they seek to buy without a middle-stream player. Buyer and Farmers can exchange goods for funds directly. Considerable time and resources have been dedicated to developing this system. Therefore, I strongly recommend that the system should be implemented to the fullest and provides farmers with the necessary training to ensure seamless utilization. This initiative will enable farmers to easily sell their products directly to buyers.

Abbreviations

HTML	Hypertext Mark-up Language
CSS	Cascading Style Sheet
Microsoft SQL	MSSQL

Conflicts of Interest

The authors declare no conflicts of interest.

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