

## Design and Implementation of Online Auction System For Farmers

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**Abstract**— This paper deals with the web-based online farmer auction system. The aim of developing the system is to provide an effective online platform/market for farmers to sell their goods to potential customers is the motive behind developing this system. In the developed application, technology offers simple user interface to communicate between farmers and customers. The facilities are provided for both farmer and customers for advertising and buying the goods respectively. In this customers can make a bid on their required products. The farmers can select the highest bidder based on the offer of customers. The developed system provides additional feedback mechanism features for both farmers and customers, based on quality of product and interaction among farmer and customer. The developed system is easy to use and faster. The products sold in an online auction based on price bidding, is an unique business technique. Thus, the developed system ensures the quality of the products being sold and helps, to develop user trust. The developed system avoids supply chain agent commissions, and customers will get fresh and good quality products from the farmers.

**Keywords**— Auction, Farmer, Customer, Quality, Products

### I. INTRODUCTION

In the current era, it is an crucial task to link farmers directly with the customers to sell their products. This can help both farmers and customers to reduce the cost of products, avoiding commission of agents. Hence, ground-breaking online farmer auction system is to be developed, in which farming and technology converge. In the fast paced world of today, one must be take care about criticalness of security and efficiently linking farmers and customers. The platform developed in this work offers a smooth virtual marketplace enables farmers, to advertise their premium livestock. This provides consumers access to a wide selection of farm-fresh goods [1]. The system designed help to overcomes traditional agricultural trading through online farmer auction system. This will avoid distance travelling of the farmers, to sell their commodities at physical auctions, incurring additional fees and reduce wastage of time. The proposed system can be a best solution for above mentioned problems, through online auction experience at the farmer's fingertips.

The proposed online farmer auction system can fulfill the demands for a small-scale farmer, a huge agricultural enterprise, as well as an enthusiastic consumer searching for locally sourced goods. Thus, adopting technology, promotes platform open and competitive, providing reasonable market prices for farmers with a wide range of options for customers. Proposed application prioritizes sustainability and emphasizing convenience. Developed platform can contribute for better future to agriculture, reducing carbon footprint associated with transportation and minimizing food waste through efficient distribution. This system can link farmers and customers globally through online platform [7]. This will help to create platform for international trading, providing a larger market for farmers and enabling consumers, to enjoy distinctive tastes and experiences from different regions.

### II. OVERVIEW OF THE SYSTEM

A cutting-edge technology, online farmer auction system have been developed to bridge the gap between farmers and customers through digital marketing. This will provide quick and effective responses to farmers for their agricultural goods through variety of customers, such as wholesalers, retailers, and individual consumers. The farmers can effectively utilize developed platform can be effectively utilized, to showcase their products through product listings, include descriptions, photographs, and pricing details [13]. Platform provides quick access of product to customers, contrast price of products submit bids for purchase [3]. This platform provides safe and secured payment alternatives, to ensure smooth transactions. This provides notification to the farmers and customers, real-time auction results, bids, and product availability. The proposed auction system channelizes buying and selling of agricultural goods, fostering transparency and fair competition. The customers have wide varieties of fresh goods and farmers have new platform for consumers outside local markets. Hence, proposed technology speed transactions and establish a dynamic platform, benefits both farmers and customers [14].

Figure.1 presents farmer/admin module designed, to empower farmers and system administrators with tools and functionalities to manage the auction process effectively. The key features of this module include.

- a) Registration and profile management: Farmers can create an account and provide essential details, like contact information, farm location, and type of product they cultivate[1]
- b) Listing and bidding management: Farmers can create listings for their agriculture goods, specifying relevant details like quantity, quality, expected price, and auction duration. The farmers can manage ongoing and completed auctions, monitor bidding activity, and set reserve prices [5].
- c) Communication and notifications: Farmers can interact with customers through messaging systems, addressing inquiries and providing updates. They receive notifications for bids, auction status changes, and successful transactions [6].
- d) Administration and moderation: System administrators also have access, to tools for managing user accounts, resolving disputes, ensuring compliance with regulations, and maintaining integrity of the platform.

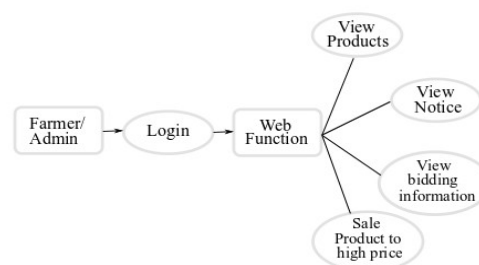


Figure 1. Schematic presentation of farmer admin module

Figure 2. presents customer module, serves as an intuitive interface for customers, providing platform to browse and participate in auctions. This module provides the following functionalities

- a) Registration and profile creation facilities is provided for the customers on the platform, to provide personal details and preferences for agricultural products.
- b) Auction search and bidding facilities are provided for the customers to search specific products, view active auctions, and place bids based on desired quantity and price. The system notifies customers regarding outbid situations if any, providing them to revise their offers.
- c) Auction tracking and notifications mechanism is provided for customers to monitor their ongoing bids, track auction status, and receive notifications about significant updates, that include auction results and successful purchases.

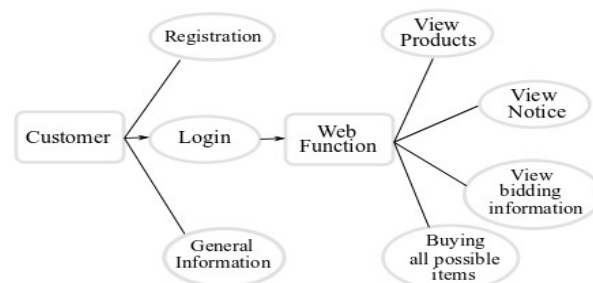


Figure 2. Schematic presentation of customer module.

### III. SUMMARY OF SYSTEM

Online farmer auction approach is a comprehensive platform created, to transform the way farmers engage with customers for selling their goods. This approach makes use of technology and internet, to create a streamlined and effective market for agricultural products. Farmers are able to access a larger audience and increase their sales potential, simply registering on the site and showcasing their products. On the other hand, customers can peruse a sizable catalogue of goods and submit bids for the goods of interest. This system encourage fair pricing and wholesome competition, ensuring both customers and sellers profit from open and market-driven transactions. To safeguard user data and enable secure and reliable transactions, system is provided with security features [2].

The system developed is user-friendly interface, that makes purchasing and selling procedure simple for users of different technical backgrounds, is one of its primary characteristics. The farmers can post product descriptions, stunning photographs, and pertinent certifications, providing consumers, information they required. The also provide the track of all the essential updates real time.

### IV. ONLINE AUCTION SYSTEM'S ARCHITECTURE

Figure. 3 illustrates the architecture of an online auction system in schematic form

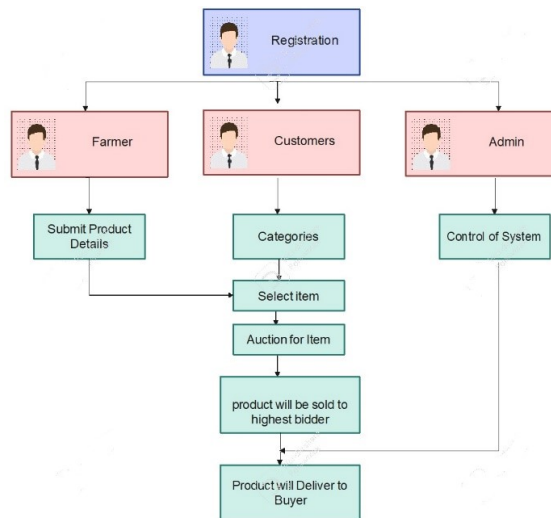


Figure 3. Schematic representation of online auction system architecture

The interaction between objects during the auction is depicted by this architecture. The classifiers or their instances can be represented by the boxes at the top of the architecture. The boxes across the top of the architecture represent their instances, such as the bidder, the login screen, exploring the screens for goods, auctions, and transactions. The auction follows the following sequence of steps:

1. The login functionality is invoked by a registered user who is bidding.
2. The system's login feature activates the search for goods feature
3. Once the bidder has received the goods information, the auction function prompts a bid.
4. The transaction screen is invoked by the bidder to display the seller's contact information

### V. EXPERIMENTATION & TESTING

The Java programming language, is used to develop proposed system. The developed system ensure well structured, maintainable, and scalable. The platform analyzed through testing process, ensuring its functioning correctly. The unit, integration, system, and acceptance testing are all part of the testing process.

### 5.1 Unit Testing

The unit testing, includes classes, methods, and functions. The unit tests were designed to verify working each component correctly producing expected output. Unit tests were automated using JUnit, a popular testing framework for Java.

### 5.2 Integration Testing

The integration tests were designed to verify components work together correctly and system was functioning as expected. The integration tests were automated using JUnit.

### 5.3 Acceptance Testing

The acceptance tests were designed to test system's usability, functionality, and performance. This tests were carried out manually through stakeholders, including farmers and customers.

### 5.4 System Testing

The system tests were designed to verify all the features were working correctly and that the system was performing as expected. The system tests were carried out manually and automatically using selenium, a popular testing framework for web based applications.

## VI. RESULTS AND DISCUSSION

The results of the proposed online auction system has been compared with the existing system [7], to ensure the effectiveness of proposed platform.

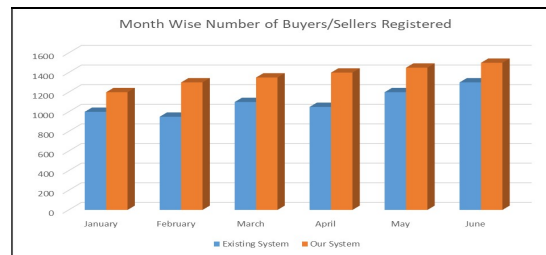


Figure 4: MoM number of buyers/sellers

The effectiveness were analyzed based on month wise number of buyers/sellers registrations, depicted in Figure. 4 [8].

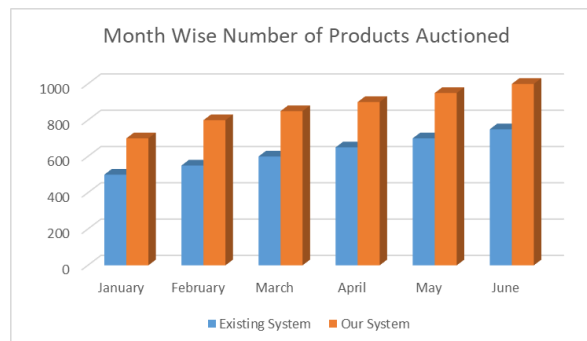


Figure 5. MoM number of products auctioned

However, Figure 5. depicts number of products auctioned through proposed platform are higher in comparison of existing system. Furthermore, various parameters metrics were considered for comparison of proposed system with existing system as depicted in Table. 1.

Table 1: Comparison of existing and proposed system based on various metrics

Metric	Existing System	Our System
Average Time Spent per User in Min	12	18
Number of Bids Placed	3500	5200
Conversion Rate	15%	20%
User Experience	3.5	4.5
Ease of Use	3	4.5
Customer Support	2.5	4
Overall Satisfaction Rating	3	4.5

Thus, based on the comparison of results obtained using existing and proposed system. The proposed online auctions system for farmers is effective, reliable and easy to use.

#### VII. CONCLUSIONS

The online auction system developed for farmers is a promising and have potential to transform agricultural products purchased and sold through online auction system. This technology offers a digital marketplace for farmers, providing platform for auction off their agriculture goods, and enables consumers to place bids on the goods of their requirement. However, proposed platform can increase the income of farmers through selling their products directly to customers without agents and their commission. The proposed system offers a clear and fair bidding process, without price manipulation. Thus, proposed platform is effective and significant for both farmers and customers.

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