Agricultural Auction System Using AI and ML

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Abstract – Due to middlemen who set low prices when buying from farmers and then sell the same at higher prices to consumers, farmers have experienced problems while trying to sell their food crops on the market. So we are going to made a platform which is only accessible to farmers who have a farmer's ID and registered farmer phone number. Farmers can establish their own prices for their products through a web-based programme, which also enables purchasers to participate in an online auction. The farmer determines the initial beginning price by consulting the dashboard's demand page. To verify that the price mentioned reflects the current market value of agricultural items, a machine learning system was used to make the prediction. Farmers are guaranteed to receive the highest price for their goods because to the fair competition that the bidding procedure promotes among buyers. Before participating in an online auction, farmers can choose the opening bid amount depending on the products' quality, lifespan, and current market price. Since the dashboard is updated often, buyers can see the highest bid amount listed there. Once the validity of the bid has expired and the matching buyer and seller have been alerted by SMS, the choices are locked. Customers can put their questions on the interface and receive assistance from agricultural experts using it as a decision support system. It is a user-friendly website that was exclusively created with farmers'

I. INTRODUCTION

Farmers basically belong to rural areas, being unaware about the market conditions and due to the lack of study related to various market places over world, they have to sell their AGRI products in local market. Even many times buyers, dealers of AGRI products are unaware about the productions, quality, quantities and availabilities of different AGRI Products produced in every corner of country or world. May be buyers don't have time to go and waste their time to buy the product in market. Now everyone wants to save his time.

The basic idea of this, web application is to provide a user-friendly Application for the buyers

and sellers/farmers to auction their products easily. The products available through this Application for auction will be authenticated products. This will be a safe environment for online users. The traditional way of doing auction is still popular but due to its limitations more and more people are thinking of shifting to Mobile Applications. In basic manual auction there is very limited number of general public involved. There is a chance of corruption and other factors for not providing transparent bidding. In manual auction the day of auction, venue and the items for auctions are told to the general public through electronic or print media. The people who wish to take part in the auction should first register himself and then arrive

at the venue of the auction on the given date and time. This method restricts most of the interested bidders out of the city or country to decline their offer or interest as they can't be available on the day of auction. Another flaw of this method is the piles of paper work that has to be maintained and then keep it save for the future. They have to keep It has been extensively studied by economists to understand their properties as a dynamic pricing mechanism. The different auction mechanisms studied include the English auction (or ascending bid auction), the Dutch auction (or descending bid auction), the first price sealed-bid auction, and the Vickrey auction (second price sealed-bid auction). Simply we can define auction as a process of buying and selling goods or services by offering up of them for bids, taking bids, and selling items to the highest bidders. Auctions are used to sell many things in addition to antiques and arts .

A. Goals & objectives

1) Establish a digital platform that allows farmers to list
2) their produce for auction, setting the price themselves.
3) Provide transparency for both farmers and buyers
4) Employ notifications system to alert customers
5) Facilitate direct collection of items by the winning bidder from the farmers
6) Mitigate forced low selling price for farmers and high purchasing cost for end-users by promoting a direct, demand-supply interaction.
7) Providing them fair opportunity to price their labor and products.

B. Scope

1) The system aims to create a platform where buyers and sellers can interact and conduct transactions for these agricultural commodities through an auction-based model.
2) The system is flexible and adaptable, possibly adjusting parameters like bidding rules, timing, or other elements based on market conditions

C. Motivation

1) Advancing Farmers' Interests: By giving farmers the freedom to determine their produce prices and directly interact with buyers we aim to encourage fairer trade and profitability.
2) Enhancing Consumer Satisfaction: The study also targets greater consumer satisfaction. By allowing consumers to directly bid for produce and collect

track of the bidders and the sellers until their final settlement. It is a fatigue and time consuming process. An auction is a procedure where an auctioneer cries successively for high type of prices to a group of rival bidders until only one remains active.

their winning bids from farmers, it ensures access to fresher products at potentially lower costs.

II. PROPOSED METHODOLOGY

A. Algorithm

A bidding fee auction, also called a penny auction, is a type of all pay auction in which all participants must pay a nonrefundable fee to place each small incremental bid. The auction is extended each time a new bid is placed, typically by ten to twenty seconds. Without new bids the last participant to have placed a bid wins the item and also pays the final bid price. The auctioneer makes money in two ways: the fees for each bid and the payment for the winning bid, totaling typically significantly more than the value of the item.[1] Such auctions are typically held over the internet, rather than in person.

Steps:

1) t = tstart (set auction clock)

2) h = -1 (Currently no winner in start)

3) price = x (start current offer at base value x)

4) while t>0 For all bidders Bido If i != h and hitBidButton(Bi) then h = i (make Bi the highest bidder) price = price + inc (inc is the least amount should be increased by the bidder to bid higher)

5) sendItem(Bh)

B. proposed work

The proposed system consists of a web application built with NodeJS for the backend and ReactJS for the frontend with the aim of selling a farmer's goods directly to the consumer without the need for a middleman.

The program has three modules: administrator, farmer, and buyer. To use the available features, both the producer and

the end users must log into the system using the necessary data. The administrator is in charge of managing the operation and execution of the entire system. The farmer must provide both

III. SYSTEM ARCHITECTURE

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Fig 2. Functional working of system

B The proposed system uses following algorithm for Price Prediction:

1. Linear Regression: A simple and effective algorithm for predicting numerical values. It assumes a linear relationship between the input features and the output.
2. Support Vector Machines : SVM is good for regression tasks. It works well in high-dimensional spaces and is effective when there's a clear margin of separation between different classes.
3. K-Nearest Neighbors (KNN): This algorithm is based on similarity. It predicts the value of a data point based on the average of its k-nearest neighbors.

C. Image Quality Checking

Production: 1.

Farming costs Finding a dataset with information on past performances as well as information on climatic and soil characteristics, such as rainfall, temperature, moisture, and soil content, is the main objective. These variables will aid in the prediction of the crops by using different classifiers on the available dataset. Consequently, a number of parameters are assessed, with the components significantly assisting accurate crop forecast.

2. Pre-Processing:

Pre-processing is required since the dataset in use has redundant and noisy qualities. With a data redundancy procedure, the unnecessary components are first identified and eliminated from crop forecast. The categorical components are divided as part of the exploratory data analysis and given values of 0 or 1 depending on whether an element is present or absent. Further categorization based on that particular component is aided by these assigned values.

3. Classifier: Models:

Decision Tree Classifier: The decision tree is a technique for choosing the best root nodes; once we have members of the same class, we continue to split the tree based on attributes. Due to its adaptable characteristics that help materialize both categorical and continuous dependent variables, it is a type of supervised learning approach that is frequently used to address categorization problems most. This method splits the population into two or more homogenous sets depending on the most crucial criteria in order to make the groups as dissimilar as feasible. The decision tree algorithm will give us the ideal split on a number of factors for selecting the crop that will work best for the population. The decision tree classifier is suitable for crop prediction due to the feature selection procedure
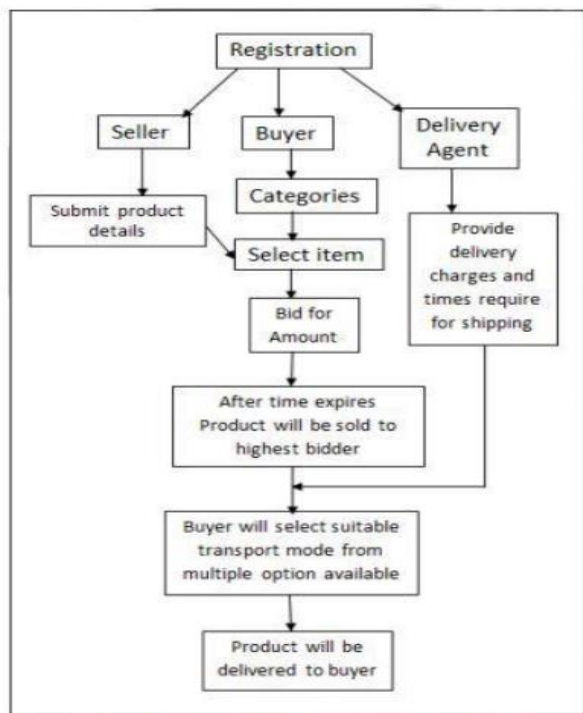
IV. CONCLUSION

Overall we provide a user-friendly auctioning site where any kind of product can be auctioned and provide value added service to the bidders and sellers. In the first phase of our project we have developed two modules. Our first module is the validation for the administrator. In the second module we provide the registration for the seller and buyers. If already registered then the user can directly login to the auction website and the administrator can keep the overall data of the users. Final phase of our project requires shipment process, where the winner of the bidder will get his products delivered through proper online transactions

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