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Online Platform for Agricultural Produce Livestock Marketing

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Abstract—The main livelihood of the majoritarian population here is through farming, who dwell in villages and feed the whole country. Food is one of the necessities of a human being, which the framers fulfill. However, they fail to get a proper price of the stock they sell in the market. Hence, they are deprived of getting profits for their stock. APMLOP helps them in getting a proper price for their stock and even get profit for their efforts. This paper aims to increase farm income in an efficient marketing system that controls the number of mediators in the marketing process and ensures maximum income for farmers. In this approach, the farmers directly deal with concerned retailers not efficient also well not at marketing system. Definitely selling the farm crops across the country and even outside the country this well indirectly help to increase the demand of the product and provide higher income to farmers also the growth of agro-based industries. By adopting new technology, develop online agriculture market web application. This web application acts as a platform for moving farmer products from the farms directly to the industry or wholesale retailers.

Keywords—Web application, Agriculture marketing, Farmer, Industry Buyer, Ratings

I. INTRODUCTION

Agricultural marketing defines two fields agriculture and marketing. Agriculture refers to the process of producing goods by raising crops and livestock. In contrast, marketing is an activity to sell those goods. Thus, combined term agricultural marketing plays a significant role the moving the farming product from the farmer to industry buyer. Agricultural marketing includes pre-reap and post-reap operations such as assembling, classifying, storing, transporting and distributing. Farm marketing involves two processes the marketing of inputs and the marketing of products. The marketing of inputs involves marketing agricultural inputs to farmers, such as fertilizers, pesticides, farm machinery, diesel, and electricity. Product marketing deals with the marketing of agricultural outcome of products the moment flow of farmers primary traders, hole sealers, industry, importers, exporters, retailers.

Agricultural marketing faces tremendous growth dueto several factors. Some of them are:
a) Increase in the supply of agriculturalcommodities;
b) Increase in urbanization;
c) Increase in income levels;
d) Evolution of the level of intervention onagricultural markets.

A. *Importance of Agricultural Marketing*
a) Optimization of resource use and results
b) management;
c) Improved farm income;
d) Broadening the markets;
e) Agricultural industrial growth.

Local traders used to purchase less price to explore the farmer's state government by protecting the farmers in 1670

time most of the state government in acted an act name is agricultural produce marketing community Act (APMC). The state government created mandis the marketing committee observed every mandi in each mandi consisting of all hole sale treads. Most of the state governments have not permitted to create the private mandi. If they want to open the wholesale shop in government mandi, you must take the licenses from the marketing community. In 2016 Indian government implemented a new idea called E-NAM (electronic national agriculture market). This idea aims to use modern technology to centralize all physical Mandis; this helps traders and farmers. Using this platform, the trader sees the other mandi prices. The farmer sells different mandi crops using the online platform. But this idea impacted the farmer negatively because transportation cost other physical mandi traders not bending the farmer's crops, so local traders used to purchase less price to explode the farmers.

To avoiding all problems, we implement a web-based application is called APLMOP (Agricultural Produce Live Stock Marketing Online Platform). We feed into agriculture through our digital platform and service partnership network. The APLMOP enables online payments between industry buyers and farmers, product quality control options, and end-to-end logistical services. The APLMOP does not purchase or promote vegetation, nor is it always a reseller. Instead of that, we give you the ability to influence the market for your culture. An attractive platform that provides opportunities for farmers and business buyers. Precise and reliable market information, business development, and negotiation. The APLMOP permits direct transactions between buyers and sellers to avoid intermediaries. We open the door to thousands of accepted shoppers and dealers. Publish your crop bid as a registered client, or create your crop provided as a platform tested vendor. Through our rigorous customer compliance, we confirm that only reliable customers gain entry into our digital market.

II. RELATED WORKS

In [1], work aims to increase profits for farmers by implementing innovative techniques and expanding the internet market. Using this platform, farmers sell the crops directly to consumers or retailers based on agriculture experts' product ratings and product ratings. This application establishes a direct relationship between farmers, consumers, or retailers. Using this, farmers sell here crops most advantageously. This application using the middleman like an agriculture expert before sell farmer crops. In [2], work to analyze the current market situation (current product on the market, highest bidding crops) by using the K-nearest

neighbors method to find the closest buyer for better marketing resolution and Given two points on a sphere and their longitudes and latitudes, the haversine formula calculates the great-circle distance between them. It is a robot-based application that gives access to farmers, sellers, and buyers. It works based on the lowest price for the best quality. This application helps analyze market conditions and search for the nearest neighbor to sell and buy the crops using KNN and Haversine algorithm. This work focuses more on analyzing the current stock market condition other than farmer crop selling. In [3], Have develop "E-Agriculture for Direct Marketing of Food Crops Using Chatbots" The main goal of this project is to use a chatbot to pay farmers a economical rate. Using this chatbot farmer directly sell here crops into consumers its helps us to avoid the middle man. Farmer register here crops using this chatbot consumers access this chatbot any social media platform. Avoid the brokers get good fair price to the consumer and farmers. Talkbot are frequently perceived as being difficult to use and requiring a significant amount of time to learn the user's needs. Negative processing is also capable of failing to filter repercussions in a timely manner, which can irritate humans. In [4], the system aims to Indian framers follow the traditional way of selling the crops using a one-to-one interaction system. This system suggests a good market based on the data mining concept. The system collects user inputs such as session type, state, and district; using these inputs gives the best crop to sell in the city using the data mining concept. Using the data mining concept, the web and mobile application farmers access the market activity and crop's highest bedding prices. It gives the highest bedding crops details rather than selling the farmer crops. In [5], developed an Android Application for Farmers in this work, most of the farmers in India depend on agriculture. Most village farmers and city farmers are not aware of the outside world agriculture and rates of crops, selling products, and buying products at any cost. This system is consisting an android application to fetch real-time vegetable and fruits rates from every market in India. This application collects the real-time crops rates from APMC. This application does not help all farmers because this application collects only vegetables and fruits rates. In [6], information and communication need for all farmers. There is a gap between the sellers and the market experts. The author proposed the web-based architecture to generate the Agri product suggestion using old data and Agri knowledge bases in this work. This system is based on the weather condition and geographic data to suggest the farmer to ceding. Sometimes this system fails to suggest accurate crops.

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III. CHALLENGES AND AWARENESS

Marketing agricultural products presents a number of obstacles Indian farmers and industry buyers such as there is no any good online platform available to sell farmer crops directly to industry and current market activity and APMC local traders use to purchase less price to explode the farmers. Most of village farmer not aware about the outside word agriculture market system. Farmers confront numerous challenges and must overcome numerous obstacles in order to receive a fair and appropriate payment for their labour.

Farmers' market information awareness was found to be lower than traders' because farmers' access to market information in terms of communication networks is limited. According to the status of assets on farmers' audio visual and communication systems, radio and television were the only assets possessed by small farmers. Medium and large farms were the owners of advanced communication technologies such as cell phones.

IV. PROPOSED MODEL AND EXPERIMENTAL ANALYSIS

The system offers platforms such as web applications wherein farmers sell their crops directly to industry buyers with multiple options. Farmers and industry buyers benefit significantly from the installation of this web application. This system helps farmers find out their respective crop industry's and demand for particular crops, and buyers and farmers check the highest bedding rate based on the period within less time and with less effort. This platform offers farmers and industry buyers to sell and buy crops online. This platform helps to avoid the APMC Mandis and increase the farmer's income double.

A. Objectives of Proposed System

There have been many aspects that solely influence the system as a business, but these determinants play a significant role in determining the success or failure of APMLOP from the perspective of the end user. In other words, APMLOP is the solution to these described problems:

Time: Bidding is totally a time-based process. The bidding is a limited with subject to time constraints. Due to non-perishability of the stock, the time constraints would also be there for delivery. Also, the delivery would be done the next day of the bidding process after the stock would be selected.

Convenience: Convenience has been considered the greatest goal of any business after profits. The system is convenient throughout and is accessible to the customers, farmers and the mediators as well. Convenience is one of the major factors that would let customers to buy stock online from farmers. Convenience is the change what will be brought here through our project and is the new innovation here. The new convenience here is convenience through the farmers selling and delivering the stock to the customers online.

Perception: A customer's perception can be a trick or be a sweet treat for businesses. Any product that a industry buys is due to the certain expectations that they have. Many goods and services are facing fresh competition from alternatives as well as entirely new offerings or bundles from outsiders in the industry. The farmers have a perception for this system as a new technological system which would act as a virtual intermediary between farmers and the industry for agro stock trading.

Customer Satisfaction: Customer satisfaction is key determinant which affects a System's overall growth. Efficient customer grievance through feedback system would be our aim. Customer satisfaction and efficient service would be the main key for customer retention. If the customer would be satisfied then it would construct a belief and faith in the system for efficient and quality service to the customer. Hence customer satisfaction is an important factor to be focused by the system management.

Cost of Quality: Cost of quality is a methodology that allows the system to determine the extent to which its resources/manpower are used for activities that prevent poor quality, the management along with the mediators should provide quality service such that the customers should opt for our services amongst the other competitors. The management working on front and back end of the system and also the mediators should ensure that the quality service delivered by them is not poor and is far better than average.

Reliability: A service offered by any system should be reliable which means he quality of being trustworthy or of performing consistently well. The belief which is built and created in the minds of the customers by the services provided by the system can be called as reliability for our system. The Aim of the system should be such that constructing reliability among the customers and public through satisfaction through quality services.

B. Tools and Techniques

The system's architecture maintained the MVC pattern, and Java Script is the object-oriented programming language used to design hole system, React Js Faces is the standard for building the front end design, Node js is run time environment for react js components, Node js and Express js is standard for building the APIs, Google analytics used for security and future improvement of application and Visual studio as development environment (IDE), i18next npm package help full for translating languages, Node mailer npm package help full for sending the emails, Node js is the tool used for management and automation of projects in Javascript, React-router-dom is the npm package with

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support to create and maintain the URLs and Mongoodb is the non relational database management system.

Table 1: Tools and Techniques

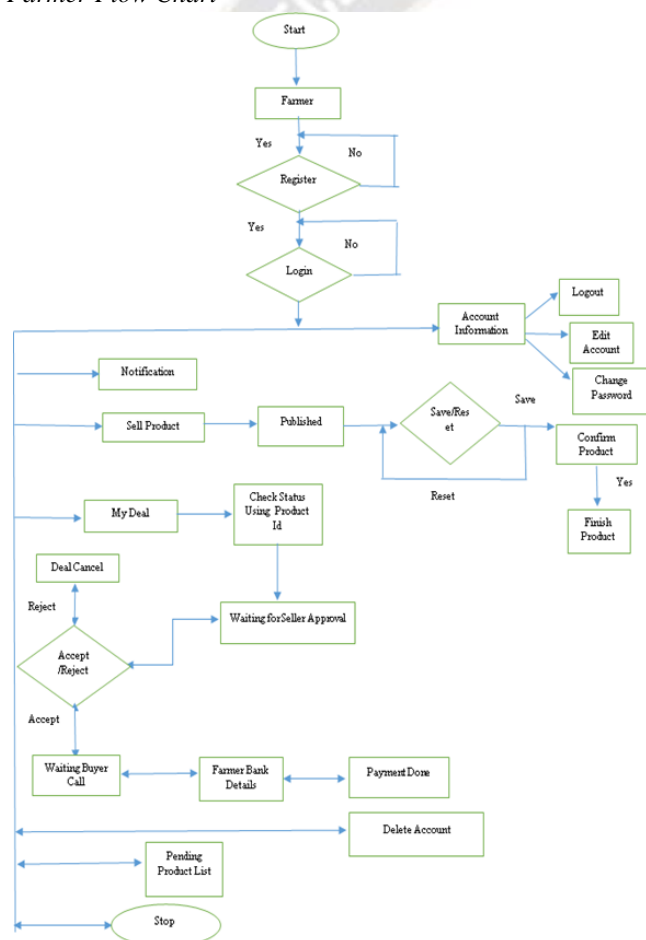| Field of expertise	Tools or technique
Software architecture	MVC
Programming language	JavaScript
Server	Node server
IDE	Visual studio
Development	React Js, Node Js, Express Js
Database	Mongoodb

C. Farmer Flow Chart

Figure 1: Farmer flow chart

Essentially, this model will function as follows:
a) Begin with the registration page, where you can choose between being a vendor or a buyer, or both;
b) After completing the registration process, the contestant will receive an email containing access details;
c) The user details page will open once your login with your credentials;

If you seller or farmer you see the below options in user details page.

Account Information: Farmer use this option edit the personal details (Mobile number, Email Id, Name) and change the password.

Sell Product: This option is heart of farmers using this option farmer demand his crops and also sell here crops directly to the industry buyers. This page contains three options.
a) Published Section;
b) Confirm Section;
c) Finished Section;

Published Section: This is first section of sell product. Using this option farmer enter her crops details and demand rate and total weight so on.

Confirm Section: This section helps full for before finished your crops farmer once again verify the enter details. If you modify the enter details farmer use the edit product option otherwise enter confirm button for next process.

Finished Section: After completing published section and confirm section farmer move on to finished section. This section helps full farmer download her product selling invoice this invoice helps for next process.

My Deal: If any industry buyer start her bedding your published product from APLMOP platform this section is very useful for selling crops to bedding buyers. This section contains 4 status before farmer sell her crops to industry buyer.
a) Waiting for seller approval;
b) Waiting for buyer call;
c) Waiting for seller bank details upload;
d) Amount credited.

Waiting for seller approval: Based on farmer initial bedding industry buyer start bedding her farmer crops based on quality of crops. Farmer his satisfied bedding rate then farmer accept the request otherwise reject.

Waiting for buyer call: If the farmer accept the buyer bedding rate then next step is to buyer call verification.

Waiting for seller bank details: Once's phone call verification done next step is to seller upload the bank details.

Amount credited: After farmer upload the bank details next step is to buyer send her total amount to farmer then buyer upload UTR Number.

D. Buyer Flow Chart

Figure 2 show the buyer flow chart. Buyer start from

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register section once's buyer registration completed next step login otherwise if the buyer cancels the registration the system again starts from start section. After completing the registration section buyer receive the mail this mail contains login credentials. Using this credentials buyer login once's login successfully completed buyer moving into user details page otherwise if the buyer enter the wrong credentials user stell live into login section page. In user details page consisting account information section, company information, sell product, buy product, my deal, my saved list, pending product process list, notification, delete account. Buyer see the account section page once's login success this page help full upload your profile, edit your account and change password. Sell product option help full for buyer also sell her extra crop to other industry buyer this well reduces the searching time for selling the product and finding the buyers. This section contains three sub section first one publish product, confirm product, finish product.

Byer also fill the company details and company representatives' details in company information section this will help full for farmer to see your company details in my dell section time.

For buyer heart of the application is buy product section. This section helps full for buy the famer product using different option this section contains filter option buyer filter based on crop type, cost based, states wise, sort by high to low or low to high, and using product id using this option help full for buyer easy search nearest farmer crops. Also, this section allows the buyer see the farmer details (initial bedding crop rate for each quintal) along with farmer product images.

My dell section works similar to the farmer flow chat my dell section, but this section is also very important for buyer for purchase the product.

Remaining section such as pending product process list, notification, delete account is also similar to the farmer flow chat section.
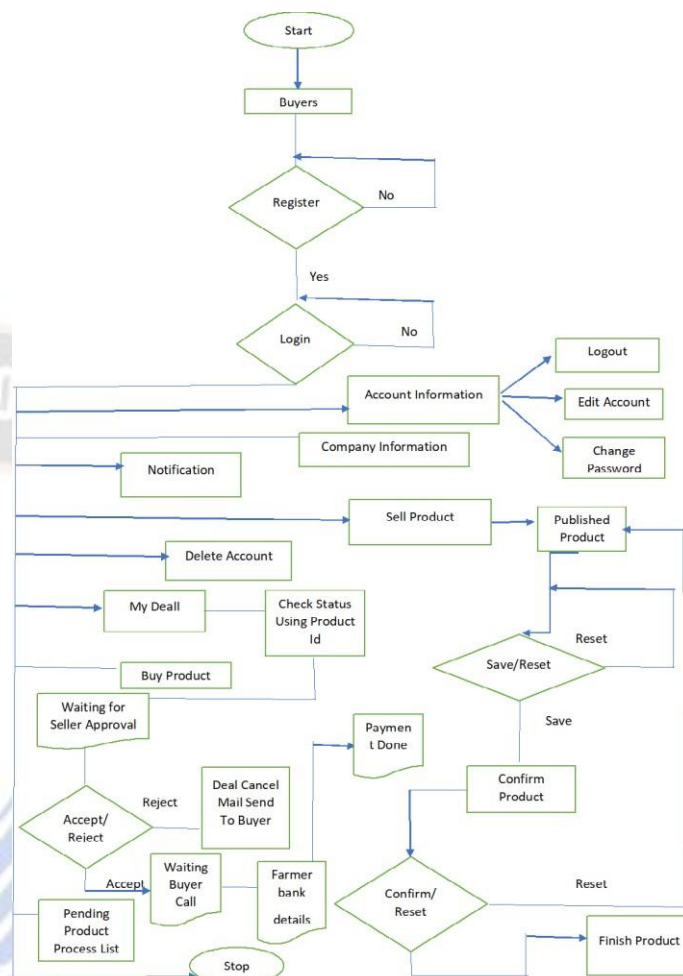

Figure 2: Buyer flow chart

E. Results and Discussion

System offers platform such as web application where in farmer sell her crops directly to industry buyer with multiple option. Farmers and industry buyers will benefit greatly from the installation of this web application. This system will help farmers to find out his respective crop industry's and also demand for particular crop along with buyers and farmers check the highest bedding rate based on your time period within less time and with less effort. This platform offers farmers and industry buyers to sell and buy the crops with online this platform helps to avoid the APMC mandis this well increase the farmers income double.

Table 2 Difference in cost when crops are sold normally and through our application.

Sr No	Products	Price (Using Middlemen 1 Quintal)	Price (Using this Application 1 Quintal)
a	Wheat	1459	1600
b	Sunflower	6200	7100

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c	Green Gram	7000	7500
d	Ground Nut	4500	6000
e	Jowar	1600	2200
f	Sajje	1300	1500
g	Ragi	2100	3000

Table 2 shows that when a middleman is not involved in the transaction of a single agricultural product, the farmer can benefit by at least 15%.

F. Indian Crop Production Analysis

Many crops are grown in India's agriculture, with rice and wheat the most essential dietary staples. Many crops are grown in India's agriculture, with rice and wheat the most essential dietary staples. Pulses, potatoes, sugarcane, oilseeds, and non-food commodities including cotton, tea, coffee, rubber, and jute are also grown by Indian farmers.

India's arable land resources are the world's second-largest. All of the world's 15 major climates may be found in India, which has 20 agri-climatic areas. In addition, it is home to 46 of the world's 60 soil varieties. Spices, pulses, milk, tea, cashew, and jute are India's top exports, while wheat, rice, fruits and vegetables, sugarcane, cotton, and oilseeds are its second and third, respectively. India is also the world's second-largest producer of fruits and vegetables, with mango and banana being the most popular. Food grain output peaked at 296.65 million tons in the 2019-20 crop year, a new high. India's government plans to produce 298 million tons of food grains in 2020-21. After a pandemic-driven recession, India's consumer expenditure would rebound in 2021, growing by as much as 10%.

Dataset Description: For conducting the agriculture crop production analysis, Kaggle Agriculture Crop Production In India dataset is used. It consisting 5 csv files, 60 columns (33 string, 19 decimal, 8 integer). This dataset contains production growth data for different crops in India from 2004-05 to 2011-12.

Statistical Method: This method is more scientific and dependable for objective crop categorization because it is based on a statistical formula. The standard deviation approach was used to calculate the minimum deviation.

$$SD = Sqrt(\sum d2/n)$$

Where 'd' represents the difference between the actual crop percentage in a certain country (areal unit) and the proper proportion in the theoretical curve, and 'n' represents the number of crops in a given combination.
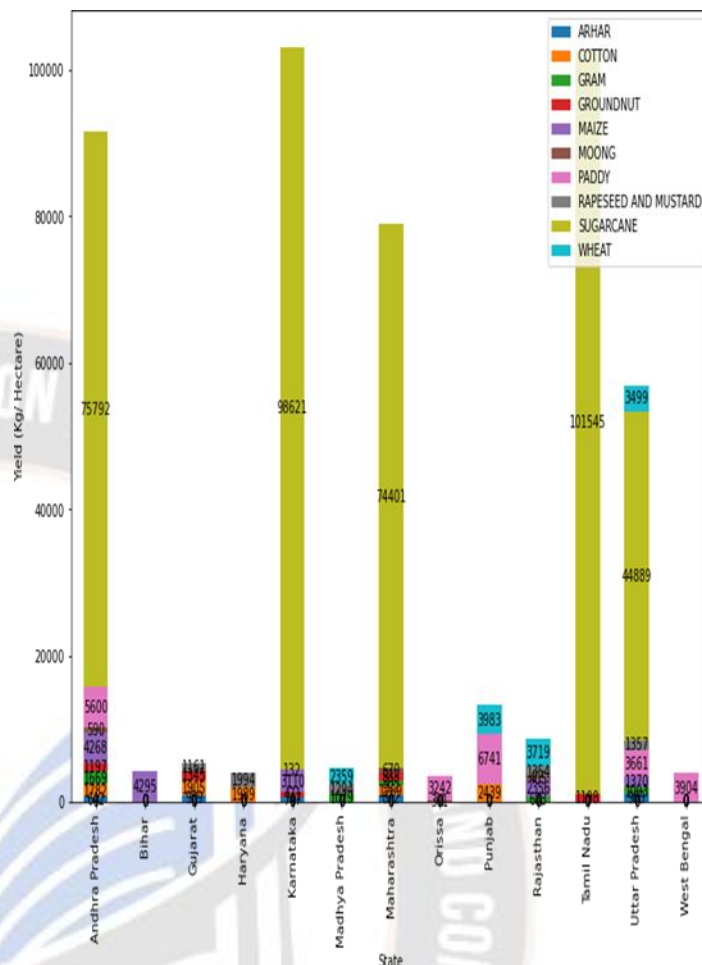
$$d = \sum d2/n$$

Figure 3: Yield of different crops across different states.

Figure 3 shows crop production in India as per 2011-12 dataset. With a population of 1.27 billion people, China is the world's most populous country. India is the world's second-largest country by population. With a land area of 3.288 million square kilometres, it is the world's sixth largest country. It has a 7,500-kilometer-long coastline. If the population increasing day by day and food production also increases based on 2010-11 crop production data shows every year in India crop production rate will increases In this plot we added values of yield as kg/Hectare. This information helps us to compare yield of different crops across different states.

CONCLUSION

APLMOP is conceptually a new idea in the era of online market. While looking at the previous works, the paper aims to successfully define a new concept of farmers directly selling its crops to the industry buyer and industry buyer buying from the farmers immediately via a virtual intermediary i.e. our device. The project aimed at providing the maximum profitability to the farmers who do not get

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profits due to the wholesalers who quote their own price for the stock. So, our system aims at providing maximum profit to the farmers through direct deal with the industry buyer.

The system is first proposed to the farmers since it is a totally new concept for them. The system would be advertised so that it reaches maximum industry buyer so they could avail the service and help in maximise the profits of the farmers. Hence, the system aims at giving the profit to the farmers and also industry buyer satisfaction resulting in success of our system with the help of mediators who would help for the delivery of stock. The system also aims at innovation through a new concept of trading of agricultural products online in the way of bidding.

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