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Agrotech the Future of Agriculture

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Abstract: ***Nowadays ecommerce has influenced a huge agricultural area. The actual need has been felt in the recent pandemic where demand and supply chain was drastically affected.In pandemic the traditional old supply chain method was crucially affected and as a result of that inflation is seen in the price of agro goods.thus this affect the farmers and buyers on a huge scale. Due to lack of knowledge farmers also have incomplete knowledge what to plant in certain region according to the soil.This is where our website Agro-mart comes in action as we are providing a b2b as well as c2c marketplace online by neglecting all the middleman and providing essential goods to farmers at low price also they can directly sell their product to the end buyer and earn profit on a very large scale.This paper is describing the need for a specific type of ecommerce method to overcome this and the factors lacking in this sector . Also Agrotech is a web-based ecommerce website and a Al and Ml platform which will analyze your soil and your environment factors and will help you to increase the production. It will guide you with new emerging technologies and methods of farming. After analyzing different multiclass ml algorithms we have used decision tree ,random forest and svm for the crop recommendation , fertilizer prediction and disease detection respectively.We are not going to stop here, we will add more features such as area wise selling for perishable products as well as.***

Keyword: combined B2B and C2C marketplace, Al and ml integrated platform, User friendly Interface,agri-e Business.

I. INTRODUCTION

There are nearly 658 millions of internet users in India currently and 80 percent of farmers are using ecommerce in multiple ways.India has significantly increased the production of crops and are always in search of a market for it. Even if there are modern methods available for farming most of the farming is done traditionally . The bi products from this we get can be used as organic fertilizers and many more. Terrace farming is now supported and done to meet the increasing demand for organic food. During any pandemic the loss is suffered by the cultivators(farmers or workers for the farmer) and the most profit is earned by the middlemans and renders . This results in weakening of the backbone of agricultural industries.The high price of fertilizers for both farmers and occasional cultivators set a drawback for production. E-commerce is applied to overcome this but it has not shown as much significant results and has its own drawbacks.

II. BACKGROUND STUDY

E-commerce in agriculture refers to the buying and selling of agricultural products and services using electronic means. This can include the use of online marketplaces, mobile applications, and other digital platforms to facilitate transactions between farmers, buyers, and other players in the agriculture value chain. One of the major benefits of e-commerce in agriculture is the ability to reach new markets and customers beyond traditional geographic boundaries. This can enable farmers to access a wider customer base, increase sales, and reduce dependence on local markets. E-commerce platforms can also provide farmers with access to real-time market information, helping them to make better decisions on pricing and production.

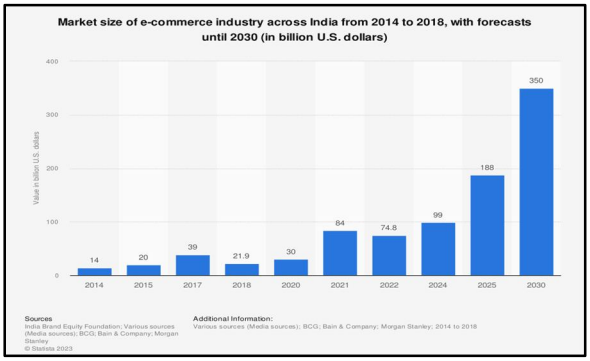


Fig 2.1[8]

Another advantage of e-commerce in agriculture is the ability to streamline the supply chain and reduce transaction costs. Online marketplaces can provide a centralized platform for farmers to connect with buyers, reducing the need for intermediaries and improving the efficiency of the supply chain. This can result in lower transaction costs for both buyers and sellers, making it easier for farmers to sell their products and for buyers to purchase them.

E-commerce in agriculture also presents some challenges, including the need for reliable and affordable internet access in rural areas, ensuring secure and reliable payment systems, and addressing issues related to product quality and traceability. However, as the use of technology continues to grow in the agriculture sector, the potential benefits of e-commerce are becoming increasingly clear.

III. LITERATURE SURVEY

The automation and technology has brought a large change in the agro industry related to productivity and quality .According to a survey a farmer from Ratnari village from SHIMLA , India has stated that there is a lot of increase in production of apples with the help of weather forecasting. Currently even after a lot of changes in agricultural methods India is facing a lot of problems. The most effective way to reach farmers now is only through the internet and digitalization.

"Agriculture E-commerce: A Review of the Literature and Future Directions" by Aradhna Krishna, published in the Journal of Agricultural Education and Extension (2017).

"E-Commerce Adoption and Performance in the Agricultural Industry: A Review of the Literature"[5].This paper provides a comprehensive review of the literature on agriculture-based e-commerce. It covers the benefits and challenges of e-commerce for agricultural businesses, the role of trust and relationship-building in online transactions, and the impact of e-commerce on farmers in developing countries. The author concludes that e-commerce can help farmers improve their access to markets and reduce transaction costs, but it also requires investment in infrastructure and training.[5]

"The Impact of E-commerce on Agricultural Supply Chains: by Maria Bjork and Marie Bengtsson, published in the Journal of Agricultural and Environmental Ethics (2018)[6].This paper examines the factors that influence the adoption and performance of e-commerce in the agricultural industry. It identifies barriers to adoption, such as a lack of technical skills and infrastructure, and the need for customized and localized e-commerce platforms. The authors also highlight the importance of trust and collaboration between buyers and sellers in online transactions.[6].

"Farmers' Perceptions of E-commerce in Agriculture: by Xiaojun Zhou and Yunliang .published in the International Journal of Business and Management (2020).[7].This paper reviews the impact of e-commerce on the structure and dynamics of agricultural supply chains. It highlights the potential for e-commerce to increase transparency and efficiency in supply chains, but also warns of the risk of exclusion of small-scale farmers who may lack the resources to participate in e-commerce platforms. The authors suggest that policy interventions and collaborations between different stakeholders are needed to ensure that the benefits of e-commerce are shared equitably.[7].

A. Obstacles In E-Agribusiness

1) Computer illiteracy and unawareness about e-commerce.
2) Problems in internet connectivity.
3) Language problems.
4) Load shedding of electricity.
5) Persistence of middlemen in the supply chain of agriculture.

B. Bugs In Existing System

1) Single Technology At Single Platform
2) Less User Interactive
3) Not includes C2C

IV. METHODOLOGY

As ecommerce is the concept on which we are going to work on, the materials used are some of the new technologies which are going to cope with our problems.We are using React as a framework and mongoDB for database management. AI and Ml is coded in python, else part of frontend editing is done by Html and Css .

A. Functions of Project

1) *Homepage:* A user lands on the homepage and has the option to browse products, search for specific products, or create an account.
2) *Product Categories:* If the user chooses to browse products, they will be presented with a list of categories such as fruits, vegetables, grains, etc.
3) *Product Listing:* After selecting a category, the user will be shown a list of products available in that category.
4) *Product Details:* If the user clicks on a product, they will be taken to a page that displays more information about the product, such as its description, price, and reviews.
5) *Add to Cart:* If the user wants to purchase the product, they can add it to their cart.
6) *Checkout:* When the user is ready to complete the purchase, they will go to the checkout page, where they can review their order and enter their shipping and payment information.
7) *Order Confirmation:* After the payment is processed, the user will receive an order confirmation, indicating that their order has been received and will soon be shipped.
8) *Shipping Information:* The user will receive updates on the status of their shipment, including tracking information.
9) *Order Delivery:* The user will receive their order, and the process will be complete.

B. Flow Diagram

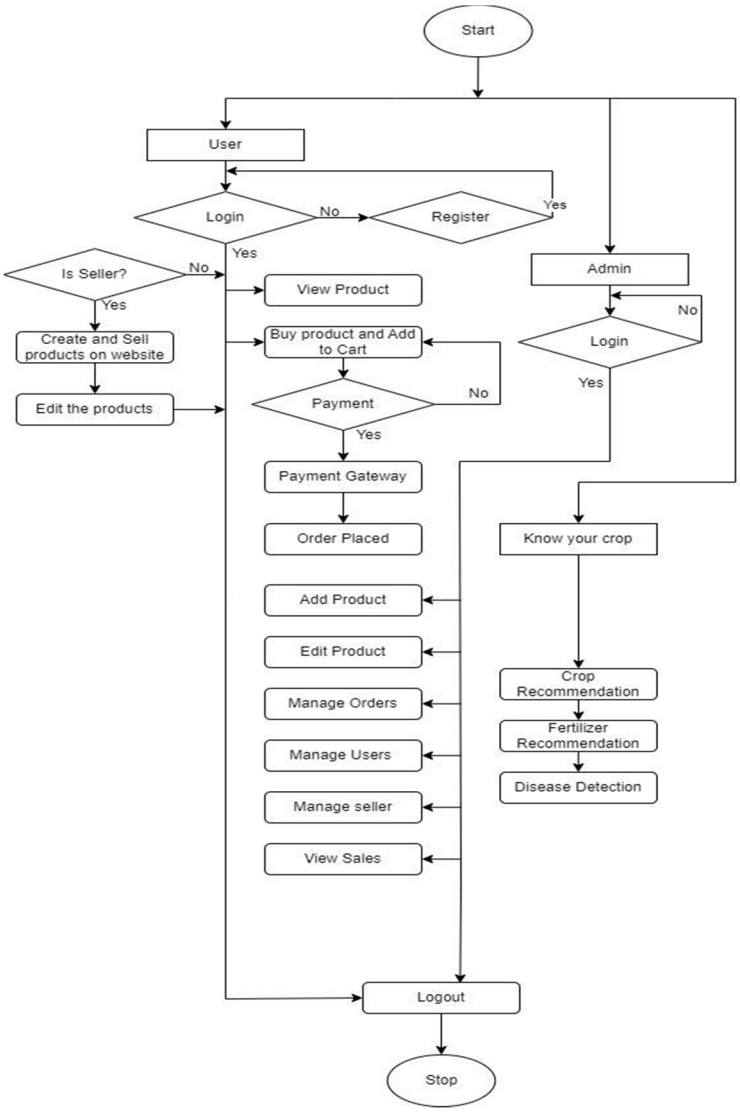


Fig 4.2.1

C. Business Model Of Current C2C System

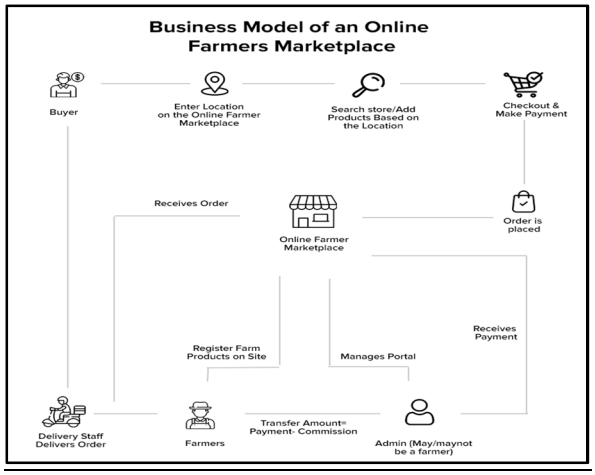


Fig 4.3.1[9]

V. RESULTS

A. B2C Overview

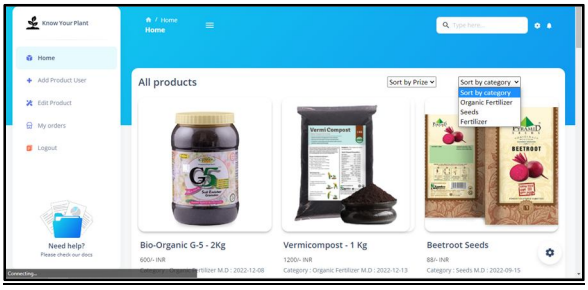


Fig 5.1.1

B. C2C Overview

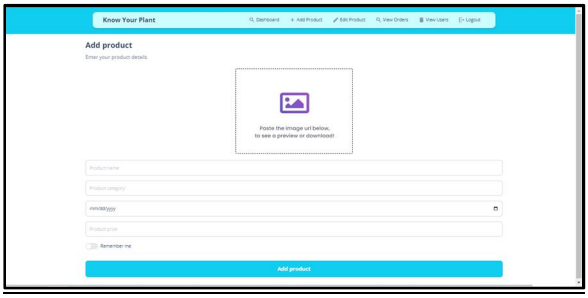


Fig 5.2.1

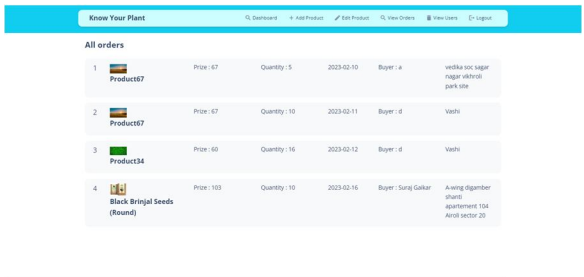


Fig 5.2.2

C. AI and ML Integration

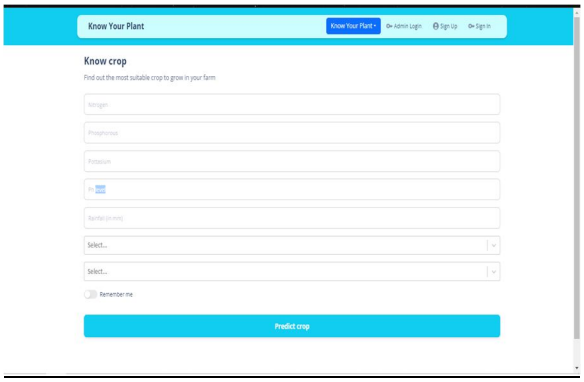


Fig 5.3.1

D. Classifier Accuracy

```
[6]  classifier_en =DecisionTreeClassifier(criterion='entropy')
     classifier_en.fit(X_train , Y_train )

     DecisionTreeClassifier(criterion='entropy')

[7]  classifier.score(X_test , Y_test)

     0.96

[8]  from sklearn.preprocessing import StandardScaler
     sc=StandardScaler()

     sc.fit(X_train)

     StandardScaler()

[9]  X_train_sc = sc.transform(X_train)
     X_test_sc = sc.transform(X_test)
```

Fig 5.4.1 Accuracy using Gini Index

```
[10] classifier_sc= DecisionTreeClassifier(criterion='gini')
     classifier_sc.fit(X_train_sc , Y_train)
     classifier_sc.score(X_test_sc , Y_test)

     0.965

     crop1=[3,140,289,0,0]

[12] crop1=np.array([crop1])
     crop1

     array([[  3, 140, 289,   0,   0]])

[13] classifier.predict(crop1)

     /usr/local/lib/python3.8/dist-packages/sklearn/base.py:450: U
       warnings.warn(
```

Fig 5.4.2 Accuracy using Gini Index

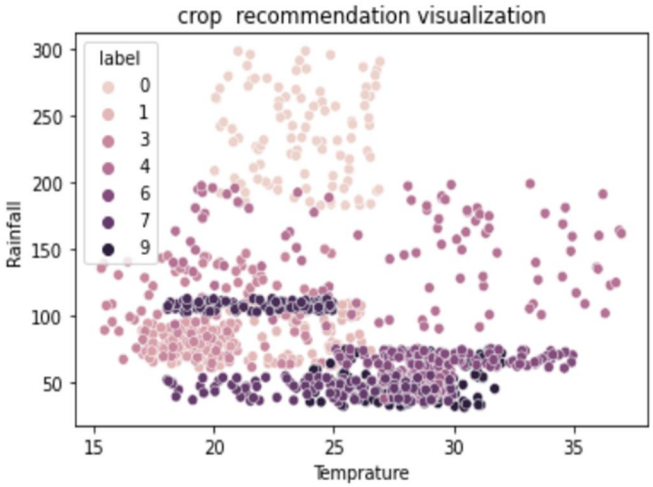


Fig 5.4.3 Visualization

VI. FUTURE SCOPE

The future scope for agriculture based e-commerce websites is promising. With the increasing demand for online purchasing of fresh produce and the growing interest in locally sourced food, there is a growing opportunity for e-commerce websites to connect consumers with farmers and local food suppliers. Some of the key trends that are expected to shape the future of agriculture based e-commerce include:

1) *Increased Demand For Locally Sourced Food:* There is a growing trend towards locally sourced food and sustainable agriculture, which is expected to increase the demand for e-commerce websites that can connect consumers with local farmers.
2) *Technology-driven Innovation:* Advancements in technology, such as blockchain, AI, and the Internet of Things (IoT), are expected to drive new innovations in agriculture-based e-commerce, making it easier and more efficient for consumers to purchase and receive fresh produce.
3) *Expansion into New Markets:* The agriculture-based e-commerce sector is expected to expand into new markets, both domestically and internationally, as more consumers look to purchase fresh produce online.

Overall, the future looks bright for agriculture-based e-commerce, with many opportunities for growth and innovation in the coming years.

VII. CONCLUSION

There is Boom in the E-commerce industry nowadays.Every Single person is purchasing something from the internet.Agro-based E commerce platform are also getting a wide reach of consumers across the globe.The main benefits of this platform is for the farmers who pays extra prices for the purchasing of the goods, there can now purchase as now they tends to get goods at lower prices due to avoidation of the middleman,different taxes which were imposed on the goods ,not getting the adequate quality of the goods.They can now purchase directly from the main retailer which in results lower the price of the goods for the farmer.But what if the farmers wants to sells his goods online.Either they sells at fixed priced to retailers or they should sell by themselves locally,in the both cases they incurred a heavy loss. The existing online trading portals are unable to accomplish the objectives of agricultural E-Commerce.As there is only one way business model in Agri E-business..

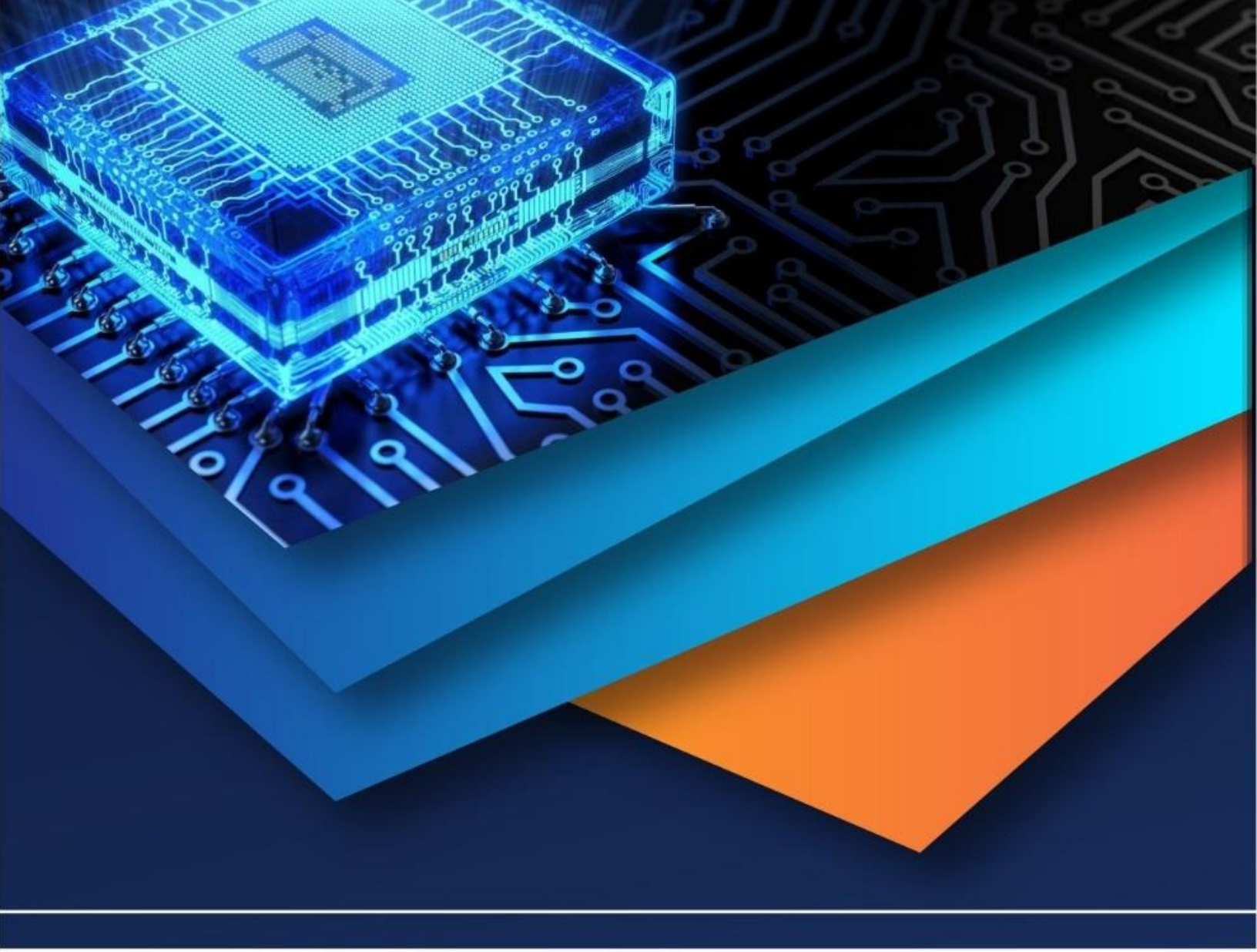
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