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# Blockchain Enabled E-Commerce For Agricultural Products

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**ABSTRACT:** The market information of E-commerce agricultural products has the characteristics of complexity and time lag. It is often difficult for producers to obtain and accurately grasp the real-time market information in time, resulting in economic losses under the information asymmetry. From the perspective of agricultural product producers, combined with the application layer of new blockchain technology and the basic platform and service platform of E-commerce information platform, an E-commerce agricultural product decision support system, which is based on blockchain technology and centered on blockchain database, is constructed. The system consists of three sub-systems: E-commerce agricultural product information service platform, inventory information feedback platform and it completes the collection, sorting and output of these three kinds of information under the support of blockchain system, so as to help agricultural producers make correct decisions and achieve the purpose of promoting agricultural product sales and increasing farmers' income.

**KEYWORDS:** inventory information feedback platform, information asymmetry, blockchain technology.

## I. INTRODUCTION

E-commerce has become an important means of poverty alleviation. However, at present, the phenomenon of "low price of vegetables hurt agriculture" appears frequently in the market, and the producers of agricultural products are often difficult to obtain real-time market information in time, which leads to their inability to adjust the planting plan of agricultural products in time according to the market demand. The main reason for this phenomenon is information asymmetry. Information asymmetry refers to the phenomenon that due to the insensitivity of information circulation, there are many uncertain factors and risks in the market. It is difficult for people to fully understand this kind of uncertainty and accurately grasp all kinds of risk factors and other aspects of information, which leads to unilateral damage of transactions. Compared with other information, the supply and demand information of agricultural products has the characteristics of response delay, dispersion and concealment, which is more likely to lead to the phenomenon of information transmission is not smooth and information asymmetry, which has a greater impact on the upstream and downstream of the supply chain of agricultural products. Therefore, based on the blockchain technology and the blockchain database as the center, this research constructs an E-commerce agricultural product decision support system to integrate the data and provide effective information for agricultural product producers and consumers, so as to realize the more optimal allocation of resources and improve the income of agricultural product producers.



Paper is organized as follows. Section II describes automatic text detection using morphological operations, connected component analysis and set of selection or rejection criteria. The flow diagram represents the step of the design of E-Commerce website. After designing a user interface for seed seller, farmer, distributor, retailer and finally to customer. By the application of Blockchain Technology, the has code will be generated for secured transaction between each module that is given in Section III. Section IV presents experimental results showing results of images tested. Finally, Section V presents conclusion.

## II. RELATED WORK

Presently, in the existing system information asymmetry makes consumers unable to identify the product quality and its origin, which makes consumers lose confidence in the product; on the other hand, it also makes agricultural producers hard to grasp the market dynamics, unable to timely adjust the output and make relevant product selection according to the market demand, resulting in a large number of agricultural products accumulation or even corruption, making agricultural products revenue is severely damaged. The asymmetry of market information will lead the producers and processors of agricultural products to make wrong production and marketing decisions, which will lead to problems such as insufficient utilization of production factors, overcapacity and low efficiency. In recent years, scholars studied and discussed that In view of the low confidentiality of business platform information and the inability of consumers' information to be protected safely and effectively.

The work in this paper is divided in two stages. 1) Making available the agricultural products on E-Commerce website 2) Connected interface from seed seller to customer with product traceability. Customer demand preference can be seen and graphs will be plotted based on demand of products. Thereafter, the product will be grown from the farmer and will be made available to customer in market. Finally E-commerce platform for selling and buying of the agricultural products and also to provide secure transaction by generating hash code using SHA 256 algorithm.

## III. METHODOLOGY

The system collects and arranges the information through the blockchain technology, and transmits the analysis results to the relevant subjects of agricultural production. At the same time, the relevant subjects timely provide the new product information generated after receiving the information to the blockchain database again, so as to form a two-way transmission chain of agricultural product information.

A large number of user data will be generated in the purchase process of the complete e-commerce platform. The alliance blockchain will summarize and record these data, process them centrally, sort out and analyze the market supply and demand information, inventory information and price information, and then push the market situation to the agricultural production stakeholders in real time through the agricultural production decision-making information system, so as to solve the problem that the agricultural product information is not available. Finally, the producers and processors of agricultural products feedback the new product information to the blockchain database, and then the database will provide the information to the upstream related subjects after collection. It has a positive impact on improving farmers economic income and making scientific production decision to accurately grasp consumers demand preference and demand.

The information service platform of E-commerce agricultural products included in this system uses block chain technology to collect and process consumer browsing data, analyze potential customer groups, and analyze consumer demand preferences. Collect and analyze the annual, quarterly and monthly market sales situation of each region, feedback the information to the agricultural product producers timely and accurately, so as to help them make correct market estimates and production and sales decisions, and maximize profits. In addition, agricultural producers can timely upload the agricultural production process to the market information service platform in the form of photos, and the system will send the processed data to the E-commerce platform, so that consumers can get the synchronous information of the agricultural production and processing process, eliminate consumers' concerns about the safety and health risks in the agricultural production process, strengthen the purchase intention of potential consumers, and promote online sales of agricultural products.

## IV. EXPERIMENTAL RESULTS

Figures shows the results of E-commerce website of agricultural products based on blockchain technology using secure hash 256 algorithm. Fig(a) shows the interfaces of E-commerce website. (b) is the image obtained when seed





seller logins and uploads the seed details. (c) interface of farmer login and customer demand preference can be seen by uploading the details of product (d) distributor login and adding the products (e) Customer can buy the products.

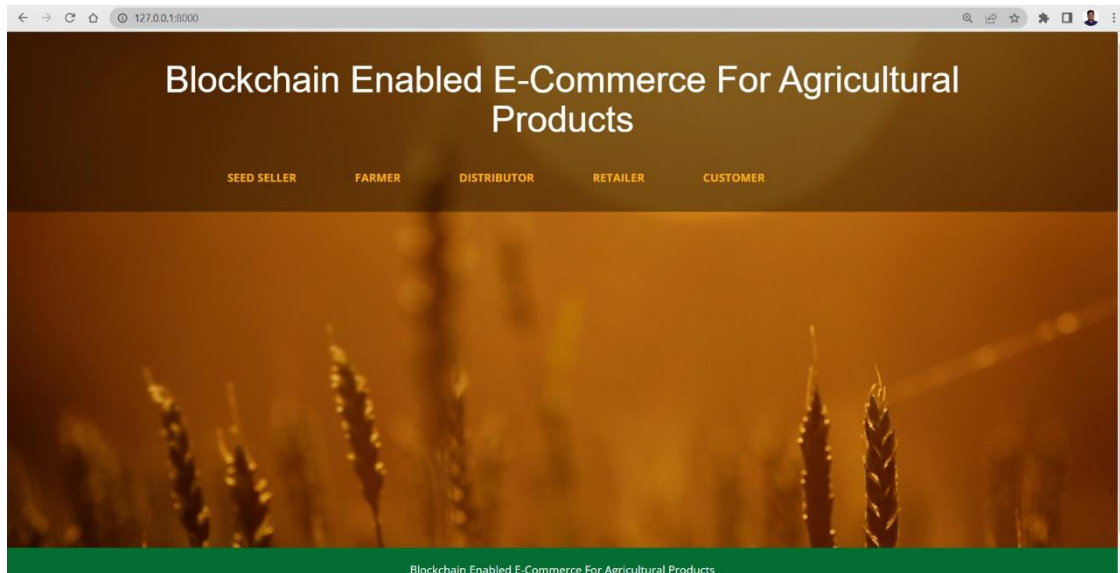


Fig (a) shows the interfaces of website

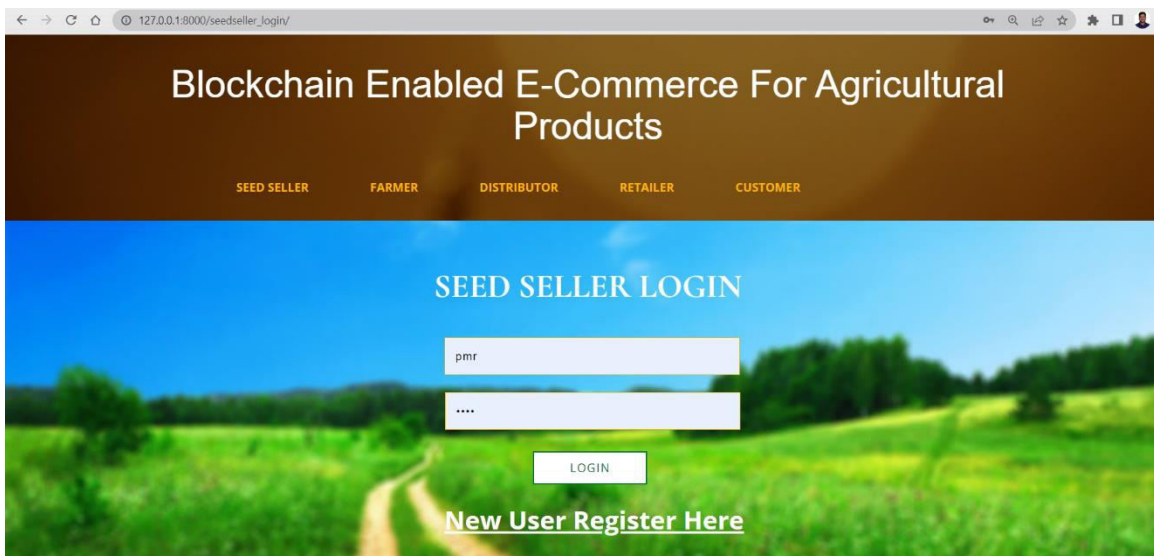


Fig (b) shows the interface of seed seller login

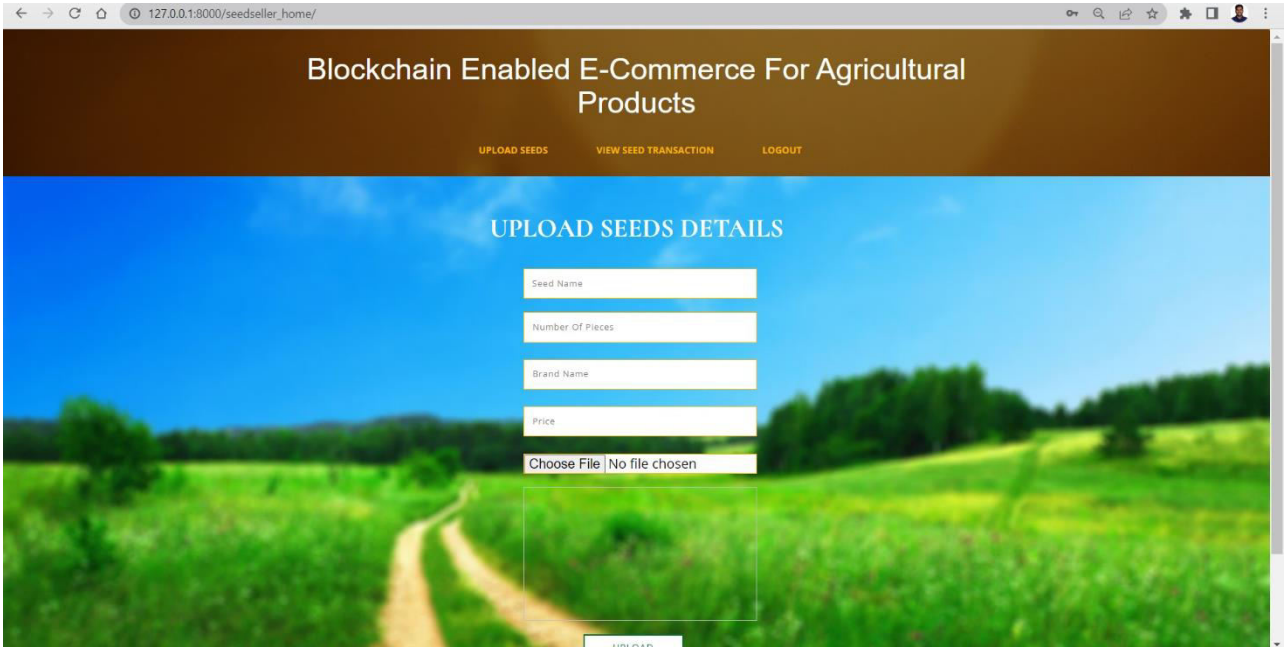


Fig (c) shows the interface to upload the seed details by seed seller

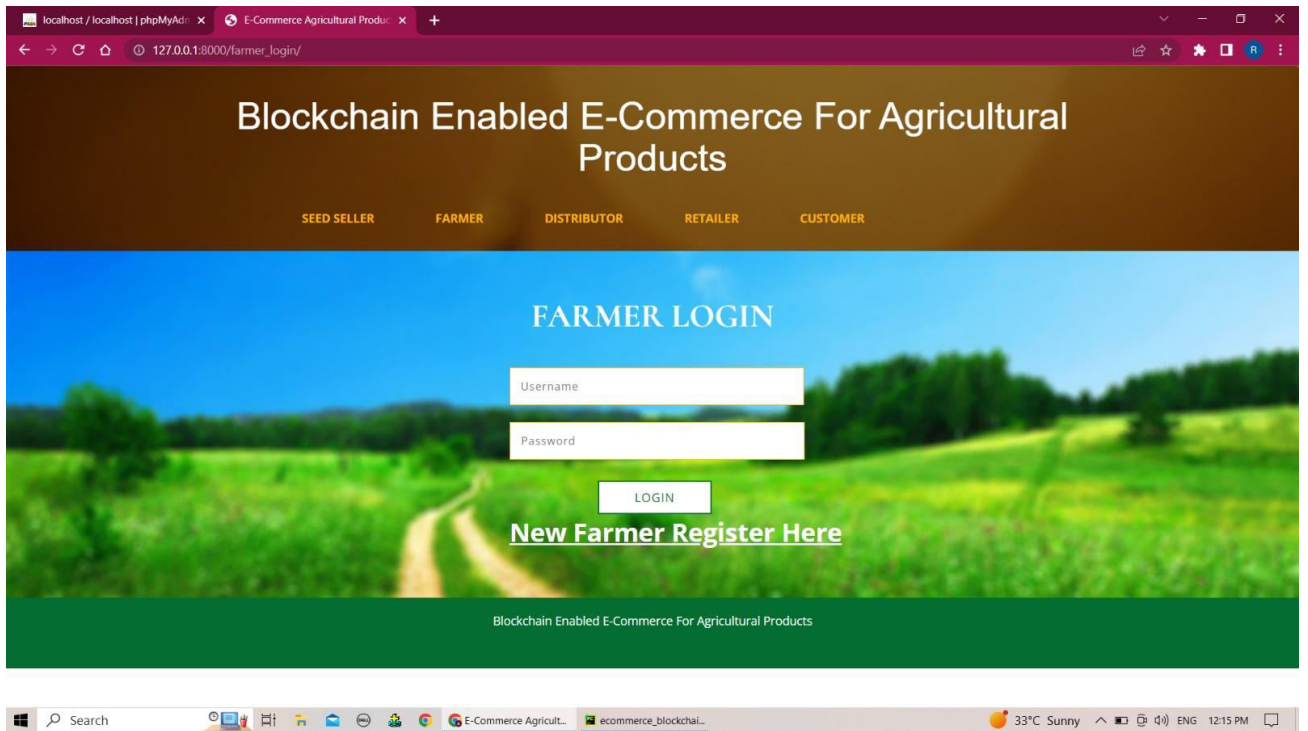


Fig (d) shows the interface where farmer can login to buy seeds

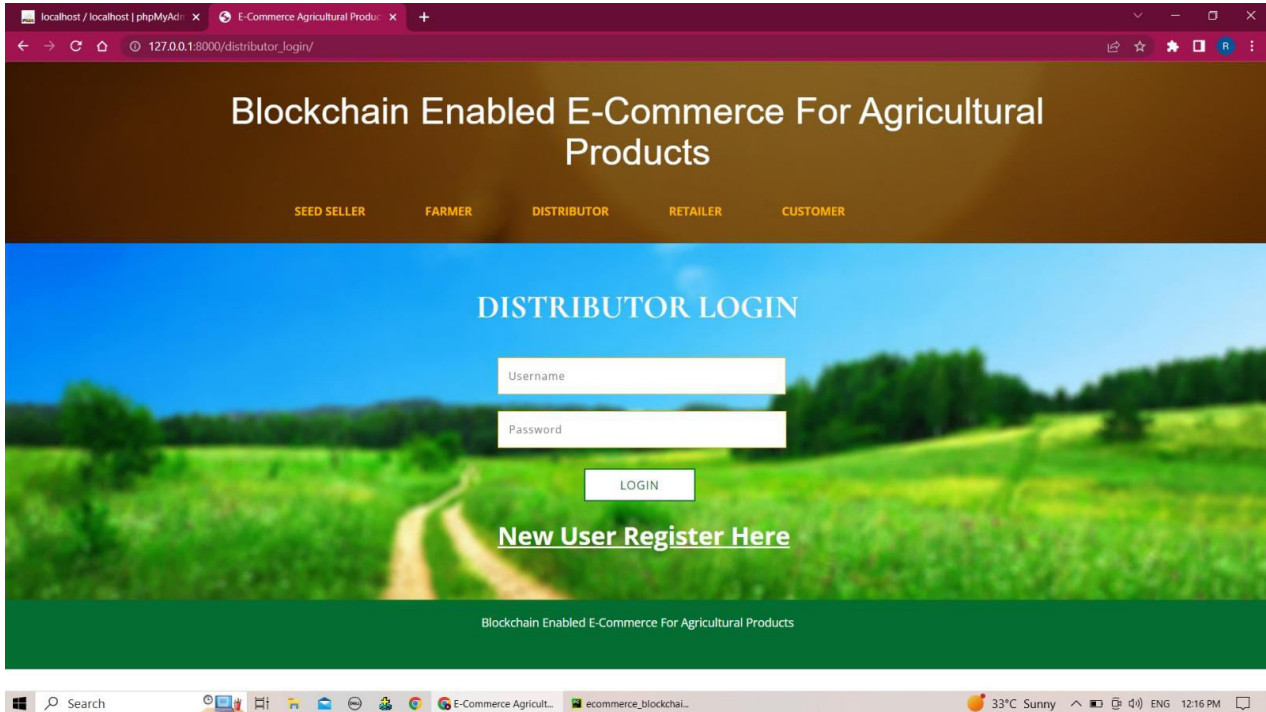


Fig (e) shows the interface of retailer login to get the products from distributor

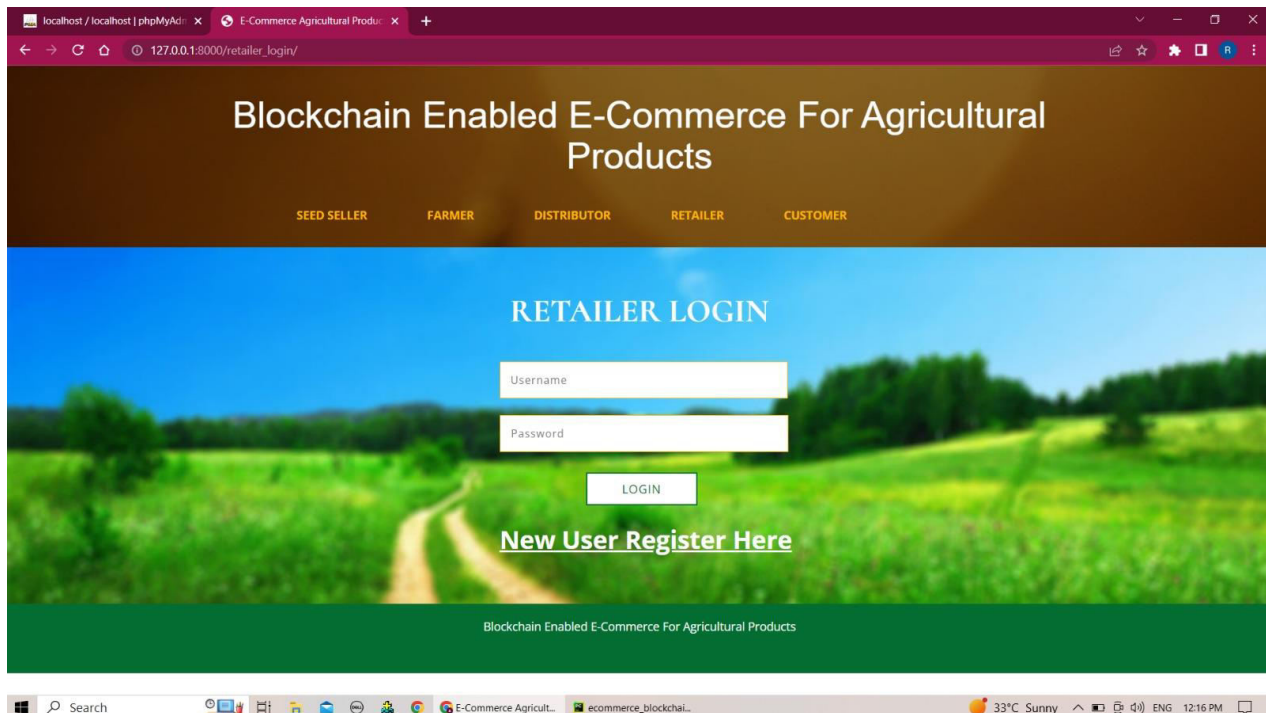


Fig (e) shows the interface of customer where the customer can get the product from retailer

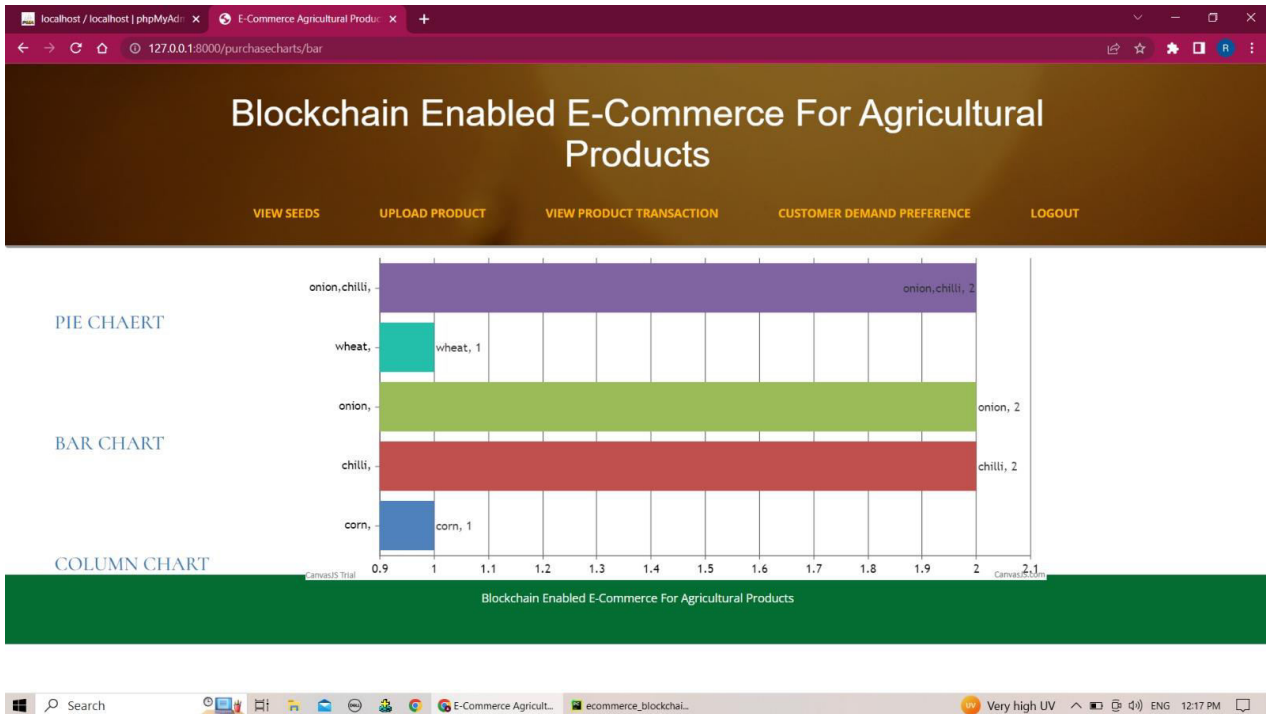


Fig (f) shows the interface of customer demand preference of each product on website

## V. CONCLUSION

The application of blockchain technology in the field of traceability is increasing, the system uses the blockchain technology to collect, analyze and process the data, feedback the market supply and demand to the agricultural producers, so as to solve the economic losses caused by the information asymmetry of agricultural producers. Under the supervision of the government and the market, the system can also operate effectively and reasonably, so as to eliminate the economic loss of agricultural products caused by market information asymmetry in a real sense. This not only expands the new idea of blockchain technology application, but also realizes the interconnection of information chain and value chain, which provides a new way to promote the development of agricultural modernization and increase farmers' income. In the near future, we will be able to add more products to our website. And we will give priority to the product based on market price and availability.

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