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E-Commerce Platform Design for Producer and Consumer Connection

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Abstract: This article describes the importance of the establishment of a “producers and consumers connection (referred to as “P-C connection”) electronic commerce (e-commerce) platform. I will discuss the design and implementation issues for such platform, and finally propose paradigms for its success running.

Keywords: P-C connection, the connection platform, connection, platform system

1. Introduction

The use of information technology (IT) has become a primary survival factor for business organizations in a global competitive environment. However just as IT can make money for business, it can also lose money, as IT has become a major corporate expenditure.·····

Electronic commerce (e-commerce) has been developing rapidly in recent years due to the emergence of information technology. It offers the market many of its unique advantages, especially demonstrating, trading goods, and providing after-sales services without time or geographical restrictions. However, it also has its own weaknesses. For instance, remote trading brings the consumer less satisfaction, and it poses severe challenges on safety and integrity issues.

Recently, the prices, especially those for the basic necessities have been rapidly increasing, which brought a lot of difficulties to people’s daily life. However, the production cost increment of the basic goods induced by the price increment is very limited, while most of the increment is happen in the circulation process. For example, the vegetables which cost 0.2 Yuan/kg and has the wholesale price of 0.3 Yuan/kg after a mid-distance (1000 km) transportation, is sold for 2 Yuan/kg to the consumers after it reaches the market. This has been referred to as the “one kilometer phenomenon” in China. To solve this issue, many cities of China begin to connect the farm and the supermarkets directly^[1], reducing the circulation cost and benefiting the producers (in this case, the farmers) and the consumers greatly.^[2]

Unfortunately, in the current market, “one kilometer phenomenon” does not only exist in the circulation of agricultural products, but also many other necessities. To save and more properly utilize social resources, maintain price stability, and more effectively develop real economy, it is expected that we take the “farm and supermarket connection” paradigm and expand its scope. I name the new paradigm as the “Producers and consumers connecting” paradigm, (hereinafter referred as “P-C connection”). Under such paradigm, producers and consumers can both receive more benefits through bypassing the circulation process.

The “P-C connection” can be realized by modern e-commerce platform^[3], taking advantages of its restriction-free (in terms of both time and space) property. Furthermore, if equipped with effective integrity protection and management, we will be able to realize “P-C connection” e-commerce platform (hereinafter referred to as “the connection platform”) with high confidence and low cost^[4]. The development of the connection platform will greatly benefit the economy and the entire society.

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2. P-C connection e-commerce platform system design

The connection platform helps to connect the producer and consumer without any in-betweens. However, it is not supposed to be directly accessed by the producers or consumers. The producers and consumers must access the platform through authorized members, and then they can conduct a variety of transactions or settlement procedures. The logistic system and the third-party financial service system will both be included into the platform to provide supportive services. The system design for the platform is shown in Figure 1.

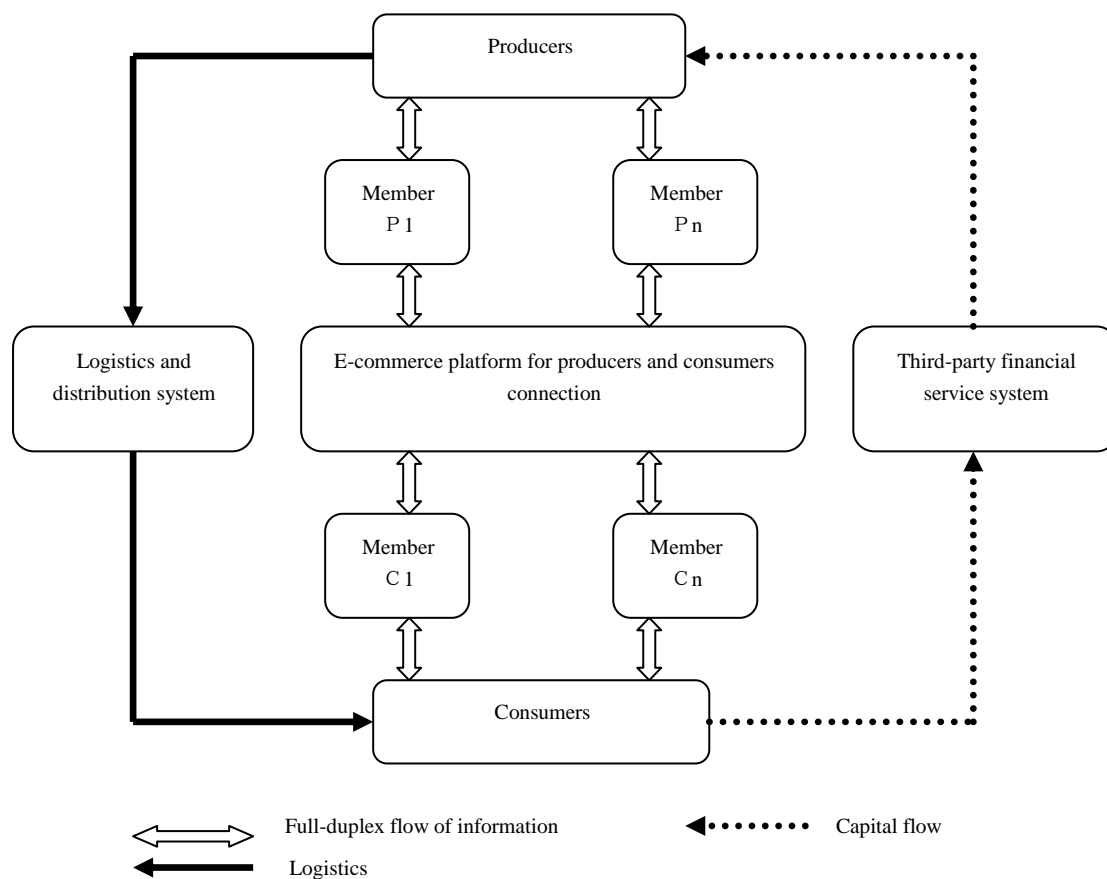


Figure 1: The "P-C connection" e-commerce platform system structure.

The connection platform system consists of the platform itself, the authorized members, logistics systems (formed by transportation or postal service providers), and third-party financial services system (formed or authorized by a qualified bank). In Figure 1, Member P indicates the logical member that represents the producer group, and Member C indicates the logical member the represents the consumer groups. A logical member can have multiple roles, i.e., it can represent the producer group and the consumer group simultaneously.

The connection platform serves as the center of the entire system, and it coordinates with all other parts after the completion of a transaction. The platform will first notify the producer member and consumer member the success of the transaction. At the same time, it will inform the logistics and distribution systems to prepare for transportation, and the third-party financial services system to freeze the money spend in the transaction. After the consumer receives and approves the products, through the platform they will notify the third-party financial services to start transferring the money to the producer. After the platform receives the transportation completion message from the logistics system and money transfer completion message from the third-party financial services system, it will start settling and archiving, and finally complete the transaction.

The connection platform system should be established as a non-profit organization, and operated by the corresponding government department. The government department should also be responsible for assigning appropriate managing team to the connection system.

The connection platform system may include membership. The members could be the authorized e-commerce transaction agencies, the logistics and distribution companies, and authorized third-party financial groups, to complete the settlement and clearing items of the transactions. They can be established by all kinds of logistics or express delivery unit, or can be converted by the local wholesale market.

The connection platform system should have the following features:

1. Merchandise demonstration: The connection platform demonstrates the images, technical details, and customer feedbacks etc. in the form of multimedia through the internet. Doing this can help the consumers to familiarize the product's utility, quality and advantages when making their final decision.

2. Real-time price display: The price of the merchandise is suggested by the producers (sellers) based on current market. The price will be sent to the buyer through the connection system. The price cannot be changed until cancellation.

3. Seller-buyer matching: The connection platform will receive transaction claims from both producers and consumers. According to their respective claims to the transaction, the connection platform will match them with priority based on the claim submission time, and price of the merchandise. The representative members of the system need to review the pending transaction, making sure the expected amount of money and merchandise are available. In order to obtain a fair market price, the connection platform will also include an auction program to allow bidding during the beginning and the end of the transaction.

4. Merchandise delivery: After the transaction, the connection system will send request to the relevant members, freezing the merchandise and money used in the transaction. The products will be delivered immediately by the nearest logistics system. The buyer will need to verify the merchandise after he receive it, and issue an acknowledgement to transfer the money through the third-party financial service system (fees will be charged at this time).

5. Supervision and protection: In order to ensure the fair transaction and protect the benefits of the buyers and sellers, the connection platform system must monitor and supervise all transactions. For seller, the quality of the merchandise is mainly monitored, while for the buyer, the system will ensure they have enough money available to complete the claimed transactions. Market manipulation behavior for both buyers and sellers should be monitored. In order to avoid major price changing, the price fluctuation restriction system may be incorporated into the platform.

6. Supportive systems (logistics and financial system etc.) real-time connection: The connection platform is connected with all supportive systems through network. Transaction information received by the platform will be immediately sent to the supportive systems and processes to ensure stable and effective operation of the entire system.

7. Trade statistics (market demand and production capacity, etc.) sharing: According to the transactions submitted to the connection platform, it is possible to conduct real-time and comprehensive statistical analysis. The analysis results will be published regularly, providing invaluable information for decision making.

8. Emergency handling and recovery: Once there is an emergency event happening (such as natural disasters, unpredicted failures or other major accidents), the ongoing transactions need to be suspended. At this time the system should backup all important data. As the emergency is resolved, the system will resume the suspended transactions by referring to the backup data. The uncertified transactions during the emergency event should be considered as a failure, and the entire transaction should be started from initial position.

In order to realize the design features, the connection platform needs also some of the support systems. The

main support systems are specifically designed as following:

1. Logistics and distribution system: The system carries out standardization of logistics delivery. All items are packaged and delivered as the unit of “lot”, making overall scheduling possible. Therefore, the transport efficiency can be greatly improved. Logistics and distribution system not only can run as the normal way, transporting goods from its origin to the place of consumption, but also can run as “real-time transmitting”, that is, according to the real and forecasting demands of market, the system delivery a certain amount of popular items to major areas at the first; then if a demand occurs in one of the areas, in-city delivery could go directly. Real-time transmitting can greatly reduce the cost of logistics and delivery time per item.

2. Systems of cash flow operating and management: The management and monitoring of the cash flow of the connection platform should be implemented by a qualified third-party financial services system. The sellers and the buyers on the connection platform pay the margin to the third party financial services system by the members. Once the transaction happens, the payment, freezing and unfreezing of funds will be implemented by the institution.

3. Transaction types to deliver quality assurance system: The specialized technical team by the connection platform organizing often regular samples to the transaction types. Does not allow expired, substandard and counterfeit products online sales. Problems found should be resolved immediately to order the producers, and deduct the credit margin according to the actual circumstances. If the problems are caused by the producers deliberately, the responsibility of the producers must be held accountable until the abolition of its online product sales qualification.

4. Quality margin and trading margin management system: The quality margin and trading margin are used as the transactions of the connection platform to support guarantee and compensate by the producers and consumers paying. They are generally regulated by a third party financial services system. Under normal circumstances, producers and consumers pay less good integrity, and there have been problems should pay more. When producers and consumers conclude a transaction, the third-party financial services system freezes both the quality and trading margin, clears after delivery.

These major support systems need to run with the connection platform real-time match to ensure the successful completion of the connection transactions and clearings in the entire system.

3. Trading rules design on P-C connection e-commerce platform system

The connection platform is defined as the non-profit nature and it is operated by specialized non-profit organization. The transaction types on the connection platform are ordinary necessities for production and living. In order to achieve the purpose of benefiting producers and consumers, the connection platform does not allow manipulation of prices through speculation or hoarding. In other words, the connection platform is designed for connecting the real producers and consumers, to buy products from the platform is used specifically for the real consumption, and not for other purposes. To this end, the connection platform trading rules must be specially designed.

It is the "lot" as the unit of the transaction types on the connection platform, the specific weight of the "lot" is determined according to normal consumption for the consumer and to facilitate transmission for the logistics, from 5 kg to 25 kg. If it is the institutional or bulk transaction, the unit can also be 100lots or 1000lots (big lot).

If producers (sellers) need to sell their products on the platform, they must have a certain qualification, production capacity, and products as the support. This is also the protection for the connection platform to develop sustainably. Therefore, the producers must first be recognized in the production qualification, production capacity, and product quality by the national authorities, and obtain the internet sales license to sell their products in the platform account. The account opening process is shown in Figure 2.

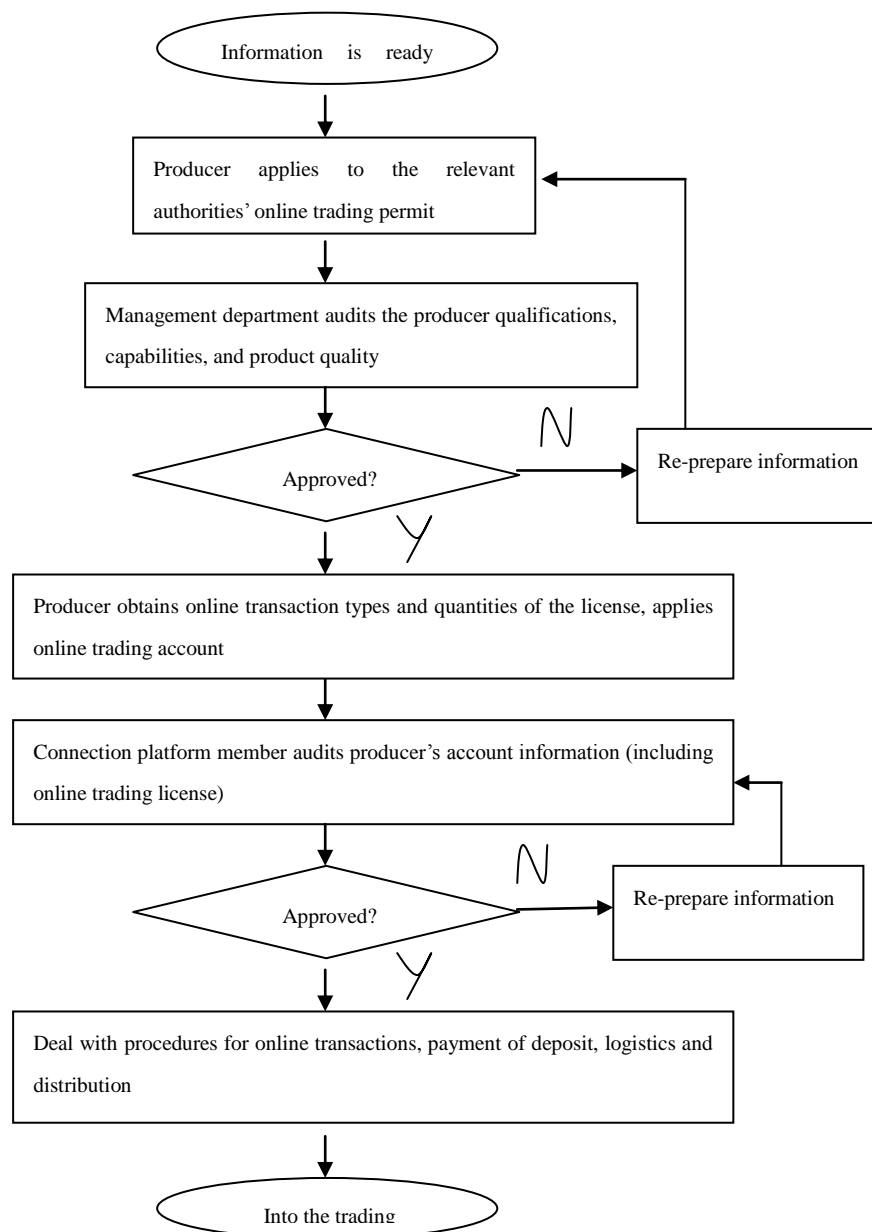


Figure 2: Connection platform for producers in the account opening process.

Consumer (the buyer) can open an account in the name of the agency account, or open an account with the name of natural person, but must be real-name accounts. The highest quantity of normal consumption needs to be submitted, and is approved by the account institution. During a time the buyer can only buy the total quantity of transactions does not exceed the maximum quantity. The account opening process is shown in Figure 3.

In order to guarantee the operation of the connection platform and the trading interests of both producers and consumers in the platform, they need to pay a certain amount of credit margin. When fraud or irregularities occur in the transactions, the deposits can be used as compensation for the casualty group.

The buyer can choose to pick up the products in the vicinity of the buyer, or choose home delivery, which was charged by the logistics sector directly into the price, the buyer does not require a separate expense.

Trading types can be spot or futures. Spot trading margin must be fully paid. The trading items are delivered in time delivery by logistics, and the total amount of purchase shall not exceed one week to one month's normal

requirements according to the attributes of the trading types to determine. Futures trading margin is paid in part by the buyer; and their quantity can not exceed the maximum total limit. In case of the futures transaction, the seller (also to pay quality deposit) will deliver the transaction products on schedule, and the financial services system by the connection platform owning completes the clearing (the price is the original transaction price). If no breach of contract, then the parties complete the transaction. Otherwise (out of the deal, do not schedule delivery or payment, product quality problems and verified, and so on), its corresponding margin goes the other party. However, it is except for that force majeure reasons. In this case, both the funds are unfreezed. The amount of deposit paid by the buyers and sellers are determined by the connection platform management part and are reported to the management for approval.

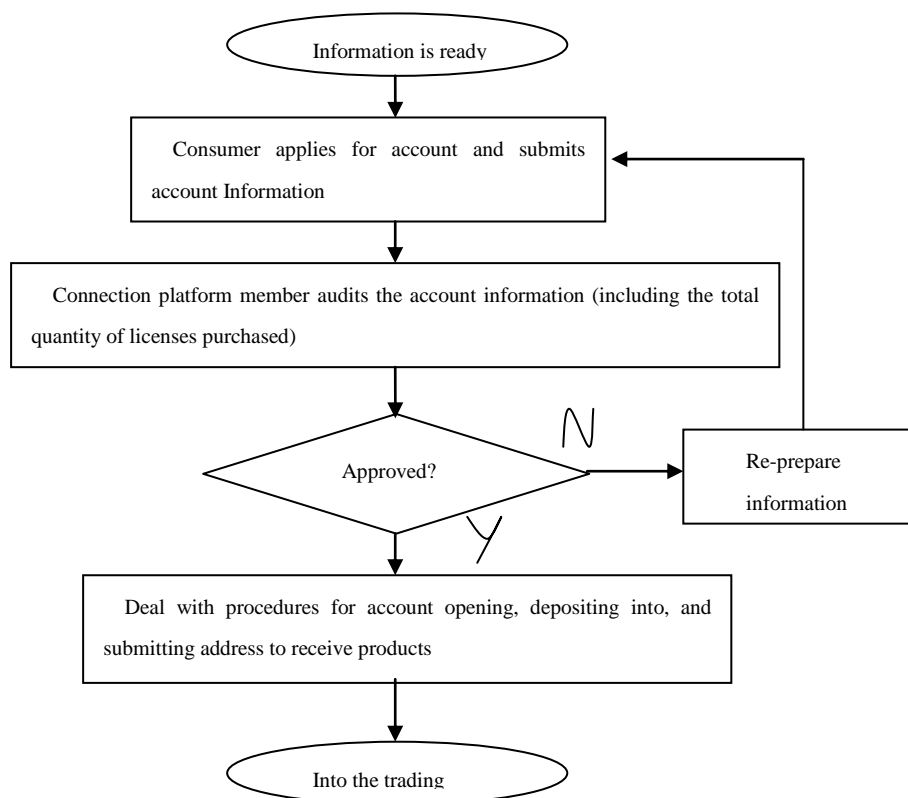


Figure 3: Consumers in the connection platform for the account opening process.

Producers can organize production and delivery according to futures orders. This can greatly reduce the waste caused by blind producing, and they may purchase required raw materials in advance to lock in profits.

Consumers can book products in advance through futures orders for consumer goods needed to achieve hedging, and reasonable arrangements for the future of living and consumption.

4. The technical guarantee for the connection platform to run

The connection platform carries out the central platform deal-maker. The type, price and quantity of online buyers and sellers around the member via a dedicated or common network encryption submit to the central platform. After the central platform receives these buy or sell orders, according to the rule of price priority, real-time priority, it completes the dealmakers, and the basic unit of transactions is "lot". After the transactions are matched, the central platform will send real-time these brokered data through the network to the relevant agencies for registration, delivery and distribution.

To make the safe operation and in the event of failure to restore as soon as possible, the platform is designed

with the following technical support:

1. Real-time monitoring: It mainly monitors the unusual fluctuations in quantity and prices of transactions.
2. Real-time transaction data released after the backup: In order to minimize the problems that arose in failure, the platform should backup the validated transaction data before sending to the members. All data received by the members is protected. As a result, in case of failure, the members' clearing and settlement are not affected and the impact of the failure is minimized.
3. Tolerance of certain failure to run: The system should be able to automatically switch if some problems occur. In this case, two systems run simultaneously. The real-time input data of the first system (primary) is written the second system (backup) as input data simultaneously. Two same system environments are established with fully synchronized. If the main system fails, it can suspend original system input, and input into the new backup system. After the main system outputs the effective data, it follows by the output of valid data backup system, so the system can automatically switch the transaction and operate normally. A three-parallel computer system may be incorporated into the connection platform, as shown in Figure 4.

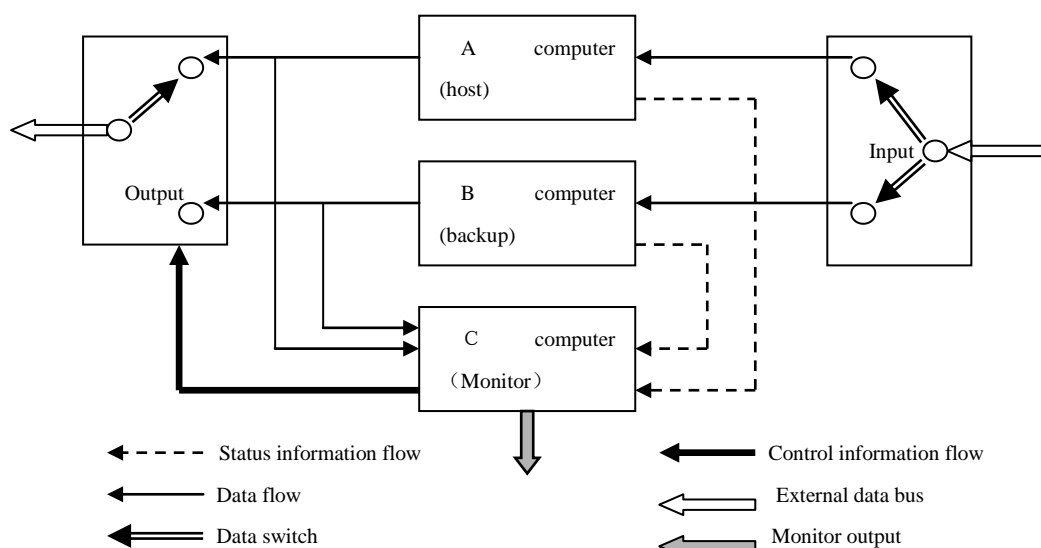


Figure 4: The connection platform trading host system structure.

To ensure the continued safe operation, as shown in Figure 4, the connection platform host system consists of three computers, A computer as the host, B computer as a backup (A and B computer configuration and operating environment are exactly the same), C computer as monitor. After external transaction data are sent into the input part through the external data bus part, the same data are sent into computer A and B. The two computers operate with the same algorithm to calculate the output data to the output part, while the results data and operation status information are submitted to the C computer. C computer analyzes the output data and operation status information to select the output data stream (to select output data stream of A computer under normal circumstances, exceptions to select output data stream of B computer), while the output control information is submitted to the system manager, as a system control basis.

The benefit is the management of trading host based on the results from monitor computer through its analysis and comparison in output data of A and B computers. This can greatly reduce the problems which manual processing may lead to. Once the transaction host failure, we can switch quickly and seamlessly through the monitoring computer to the backup computer, the external parties in transaction generally do not feel that switch.

5. Future prospectives of the connection platform system

The connection platform system operation can greatly reduce the necessities prices of life. According to estimation, the highest logistics cost for the necessities of living transported from origin to consumption is generally not more than 20%, but at the remaining parts the necessities distribution costs increase more than 100%. If we can reduce logistics cost through rational management, then under the same conditions, the price to buy necessities through the connection platform can be reduced 40-60% at least, so that we can greatly ease the inflationary pressure brought to ordinary people.

The connection platform system can be implemented first in places where conditions permit. After gradually extended, it can finally become a national trading platform through networking. Alternatively, we can set up a national trading platform for the central level, and less regional networking the first, trading some of the species, until the conditions are improved, and it gradually increase the variety of transactions and networking areas, and finally form a nationwide large-scale e-commerce trading platform.

6. Conclusion

As "producers and consumers connection" e-commerce platform involves the interests of all, and is the part of the scope of public welfare, it requires the government to organize and coordinate. If it can successfully run, the producers can achieve real benefits and organize production according to market demands, which will reduce the product price fluctuation, and may reduce the caused waste by blind production. The prices for consumers to buy necessities on the platform should be reduced greatly. Compared with the current situation it is basically offset the impact of inflation, thereby achieving social harmony and stability.

In this article, the connection platform system design is limited to the general framework and basic ideas. The detailed design and implementation are much more complex, and can refer to the establishment and operation experience of other large financial and physical trading platform. The project requires a lot of manpower, material and financial resources, but relative to its economic and social value it is very worthwhile.

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