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Internet+ Logistics in Chinese Non-Timber Forest Products Online Stores

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Electronic commerce (E-commerce) has become an international phenomena nowadays. Especially in China, due to the country's size, large population and culture, the consumption-driven economic growth plays a more fundamental role than in many other countries, which gives higher requirements for the development of modern logistics.

The rapid development of Chinese e-commerce, has made online shopping a very important part in people's daily life as it is cheaper and more convenient than to buy things from traditional stores. At the same time, the Chinese government gives strong support to E-commerce in its economic development strategy.

In March 2015 an E-commerce idea called Internet Plus (Internet+) was officially announced by the Chinese Prime Minister as an important government business strategy in the future economic development plan. The idea does not only aim to develop a new type of economics, but also to improve the traditional economics. The new strategy can decrease enterprises' cost and increase overall operating efficiency. Behind the high development speed of the e-commerce, logistics is a very important factor to ensure the success of the online business and it is necessary to realize which factors under E-commerce Logistics takes the biggest part and has the most weight among all logistics features.

In this study, I will concentrate on Internet+ Logistics, which derived from E-commerce Logistics. Evaluate the logistics performance of 364 online none timber forest products (NTFPs) stores from Alibaba online shopping mall names Tmall. The study can be seen as complete and conceptual, both in the academic and the practical field. By using entropy weight method, Topsis analysis and cross analysis, I analyze the weights of different levels indexes in Internet+ Logistics performance and also get total scores and ranking of sample online stores, in order to understand the important factors and the development trend in Internet+ Logistics. My study reveals, that some indexes such as service can largely influence the performance of online store logistics, which are the most important elements of Internet+ Logistics. The proposed framework enriches the theory of network marketing and gives directions to business owners to make improvements on the logistics quality of their online stores.

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E-commerce Logistics, Internet+ Logistics, NTFPs, entropy analysis, Topsis method, cross analysis.

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1. INTRODUCTION

1.1 Background and motivation

China has a big economic scale, however, the traditional logistics flow is high cost and low efficiency. In e-commercial time, logistics presents in different ways in serving people's daily life. With the development of economics, people's needs became larger, purchase accesses enlarged both in domestic market and foreign goods. Looking back to 1990's, it was already come up with the idea that there will be big renovation on logistics, based on the development of the electronic market. During recent years, China has already welcomed the big data e-commerce. Because of the rapid living speed, online shopping is very popular and became the most convenient way of shopping for Chinese people.

E-commerce has become a very popular business model in China (Jiang & Prater, 2002), it is growing very fast, and it matches the growing Chinese economics trend. More and more people in China and all people around the world like online shopping. The great domestic potential in Chinese market makes a lot of companies start to seek big opportunities in online market. As a result, logistics plays a more and more important role. People's demands for logistics are not only for delivery of goods from producers to customers, but also considering the information and services, such as fast and efficient transportation and after-sale services. As a compound service industry, modern logistics is the foundation for the development of the national economy under the new normal in China. As a strategic industry support, it is of great significance to effectively reduce enterprise costs and improve productivity. Comprehensive and integrated information services are the aim of developing logistics for the e-commerce market, to provide a healthy, pleasant and faster shopping environment for people. Modern logistics aim is to become a complete chain of e-commerce service, to combine manufacturing, transportation, selling and other market situations all together. In 2015, Chinese government announced the idea of Internet+, which gave a big development space to logistics field. Alibaba and JD, as the two biggest e-commerce online shopping groups, play an effect model on e-commerce online shopping. People use big-data, cloud platform and modern logistics models to reach online market intellectualization, to make market and logistics integrated.

Especially Alibaba, the biggest E-commerce group in China and a leading provider in

online purchasing area, grabbed this chance and made miracle records on online shops selling in both Chinese domestic market and International online market. The conspicuous sale Double 11 Festival, “11.11”, is a business miracle hosted by Alibaba group every year on the 11th November. Latest report by SunTrust Robinson Humphrey from the US investment bank, said that in 2019 Double 11 Festival, selling of Alibaba Group reached a record of 37,81 billion USD, all from online shopping platform (Sina net, 2020). This large number of transactions and big selling is an obvious signal for the Internet+ strategy, matches the government Internet+ business idea and becomes a future business model.

Internet+ is an innovative tool that has been applied to numerous industry sectors, such as Internet+ Logistics. With the help of Internet+ Logistics, drawbacks in None Timber Forest Products (NTFPs) and other agriculture sector have been weakened, at the same time, risk and economic losses were decreased, also help farmers and other part in the chain increased their income. The selling of NTFPs online shops increasing year by year, I believe that it will reach a high level under the Internet+ strategy.

1.2 Study purpose

Internet+ as a new announced business idea, is still on the way of further studying and understanding, same as Internet+ Logistics, there is no deep studies before. Investigation on a specific or micro level of Internet+ Logistics in NTFPs area is quite limited. Therefore, the main task of this study is to identify the index related to Internet+ Logistics and find out the weight of those index.

In the academic field, research about Internet+ Logistics has not been launched thoroughly or systematically. Previous studies in this field mainly focus on the macro level, e.g. the combination with whole industrial chain (English. Gov.cn, 2016), farming under the shared economy (McGregor, 2017), development of the agricultural informatization (Xinhua Finance, 2015), farmers' production efficiency and living standard (Long, 2015). In this study, NTFPs online stores are considered as the representation of Internet+ Logistics using targets. The general purpose of this study is to evaluate online stores logistics issues through a self-built framework and tries to give suggestions to 364 selected NTFPs online stores from Tmall for their further development. Using entropy analysis, Topsis analysis and cross analysis, give a further study of the indexes and find out the results.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

In this part, I will state my opinion on traditional logistics, E-commerce logistics and Internet+ logistics, make a comparison of these three logistics models based on analyzing literature. Furthermore, to explain the different important factors in Internet+ Logistics, give a general understanding of what is Internet+ Logistics, how it comes and why it is so important in nowadays society and what are the possibilities of Internet+ logistics.

2.1 From Traditional Logistics to E-commerce Logistics

Traditional logistics is understood as retail and wholesale activities (Chen, 2015) to move products from the supplying places to customers, mostly B2B (business to business), which contains loading and unloading, transportation, storage, packaging, repackaging, manufacturing, delivering (Xiong, 2005).

Traditional logistics mainly concentrates on the products selling part, to deliver goods to final customers with a relative low cost, each part of traditional logistics is relative independent (Wang, 2014). For example, big-sized chain-retailers always have their own logistics distribution center, millions kinds of products will be ordered to deliver to distribution center, distribution center will repackage and deliver to different markets in different places by their order. This is a very reliable way in traditional logistics, different department has its own responsibility, but there is no flow of information. The use of traditional logistics is based on China planned economic system during the past 40 years, however, it does not fit the new economics type and development any more.

With the development of e-commerce, China is in a development time of transition from traditional logistics to modern logistics (Song & Hou, 2004). During the past decade, e-commerce has developed rapidly, an understanding of modern logistics need to develop to match the e-commerce level. E-commerce logistics is based on modern information technology. It is an integration of the transportation, storage, loading and unloading, handling, packaging, distribution, circulation processing, reverse logistics, customer service and logistics information processing as well as other functions to form a pattern of integrated logistics activities. Its essence is to use modern information technology, communication technology and logistics technology to change the traditional logistics process, to control and make innovation. Logistics range from circulation field expanded to the whole process of enterprise production,

supply, processing, assembly, sales and reverse logistics, the integrated logistics management, and with the development of the EDI, internet, e-commerce technology and the development of the logistics, information network, based on the extended to the scope of supply chain management (Ma & Deng, 2007).

Different from traditional logistics, first of all, E-commerce logistics cares more about customers' needs, a modern logistics company cannot be like a traditional logistics company. A railway logistics company takes care only railway delivery, a freight logistics company only takes care freight delivery and a shipping company takes care only about sea shipment. This cannot satisfy customers' wants and needs. An E-commerce logistics company needs to clear customer's needs, to deliver goods to a point within a proper time. It is not only about what is the way of delivery, it requires the ability to organize business processing based on people's needs. Secondly, E-commerce logistics requires an integration of information flow and logistics flow. In traditional logistics, enterprises cannot grasp the use of internal resources and customers cannot know the flow and operation of goods. An E-commerce logistics company fully use Internet and information technology, combine information flow with logistics processing. Use information flow to reflect and understand the status of goods delivery, communicate the connection between market and customer, direct and control the development of logistics. Thirdly, also the main point, is the changes in business and service concepts, traditional logistics is a tool to provide transportation to the society, while modern logistics provides services for customers, customers' needs will be the direction of the company's development. To provide more specialized and value-added services and realize globalization, logistics integration, informationization, socialization to reach a new level. (Wang, 2014)

2.2 Traditional Logistics Model

Physical Distribution.

In a traditional logistics model, physical distribution acts as a flow of products from producers to customers, with different activities within the flow. It is a movement over time and space (Song & Hou, 2004). All parts through the flow were considered separately, the main idea was to optimize those activities separately, for example transportation, storage, packaging, loading and unloading. Factors in the physical distribution were relative independent and information is not shared between each part, and people can only improve services or speed within an individual stage (Zhang

& Feng, 2005). Physical distribution mainly concentrated on storage and transportation of goods and it was difficult to communicate and share information, so the traditional logistics cannot be considered working as a whole chain, and movement cannot be smooth if something happens in one link (Ma & Deng, 2007).

2.3 E-commerce Logistics Model

As a result of the high cost and lack of information communication, traditional logistics cannot match the rapid development of e-commerce. Transportation and warehouse storages are not main function phases in logistics industry anymore (Ma & Deng, 2007). Since the development of new models of modern logistics, the traditional logistics corporation and management system have faced big innovation. Internet, information, customers became the three key elements of new logistics models (Song & Hou, 2004). The government and enterprises of all levels have gradually accepted the modern logistics (Zhang & Feng, 2005).

2.3.1 Self-run Logistics Operation Model

Self-run logistics mode is a development by e-commerce enterprises in order to meet their own development needs. Enterprises have to establish their own logistics systems and equipped with their own operational people and material flow equipment, the enterprise manage all logistics activities (Gu, 2017). By establishing a self-run logistics mode, a company has the ability to better manage cost control, reduce resources waste and to save time and money. A core thinking of a self-run logistics system is to establish a set of logistics, business and information flow to integrate modern logistics distribution. (Cheng, 2001)

As the best example, the large E-commerce online platform JD Group is using a self-run logistics operation model. They have their own warehouse and full supply chain. Their logistics net covers the whole China. They have 250 thousand trucks, 6.11 million operation lines, 300 thousand service points all over the country and 12 million square meters logistics infrastructures (JD Logistics website). JD's self-run logistics' mission is to build an optimal logistics information platform through an open and intelligent way and to enhance customer experience. The aim is to reach an optimal combination of logistics, business, cash and information flow. JD tries to meet all customers' requirements and make a win-win business strategy.

2.3.2 Logistics Alliance Operation Model

The Logistics alliance operation model is working for two or more e-commerce enterprises, which has not developed to such a scale to build self-run logistics system, but have the same or similar profit aim. By signing a contract to build up a logistics developing mode the aim is to share the benefits and risks (Gu, 2017). This logistics mode can reduce waste of transportation time, avoid empty transportation, save costs and increase logistics efficiency.

The enterprises are incorporating the logistics alliance operation model into their operation and the integration provides a good platform for different enterprises to learn from each other (Zou & Chen, 2001). Enterprises can share their resources and information to make the participants in the operation move towards a more professional, more intensive and more informative way, and to provide customers with real-time and efficient information feedback (Cheng, 2001).

2.3.3 Third Party Logistics Model

Third party logistics is a contract logistics. Logistics services and all other operations related to logistics are provided by a third party logistics organization besides the supplier or buyer. The third party doesn't have any products, but sign contract with product providers to make services such as transportation, warehouse storage and other added value services to satisfy different customers to meet different specific requirements (Cheng, 2001).

Third party logistics has become a symbol of the modern logistics. The use of third party logistics, can reduce operating costs, commit to the core business, reduce investment, integrate the supply chain, and expand international business and virtualization. The development of the third party logistics is related to a country and regional logistics industry development level (Ma & Deng, 2007). Third party logistics is very flexible, it is not a simple forwarder and express company, but a company which provide diversified services to final customers based on their price, added value services and geographic requirements. Third party logistics doesn't take any role in the whole business chain, but stays in a very important position to serve the whole supply chain (Zhang & Zhou, 2006). Third party logistics services are

widely used by e-commerce enterprises, since third party logistics operations distribute through the whole of China and even remote areas, final customers can enjoy home delivery services to any place. By using third party logistics, e-commerce enterprises can effectively reduce their operation costs of logistics system and improve the efficiency of transportation and logistics quality (Zou & Chen, 2001).

A successful example of third party logistics cooperation is the Compaq Computer. By signing agreement with 80 suppliers that they will be responsible for inventory management of logistics services, suppliers are responsible for the operation of main flow process, such as testing, quality inspection, inventory management, etc. Thus, reducing the Compaq Computer investment in fixed assets and increasing inventory turnover rate. (Modern Logistics Cases in Baidu website: Case 50, Compaq Computer Logistics Outsourcing).

2.3.4 E-Supply Chain Management Model

E-Supply chain management model is a business process model, which is built up by material producer, supplier, manufacturer, wholesaler, and retailer until the final customer. The whole process is to complete the steps from the needs of customers to provide final products or services to the customers. As a new management model, e-supply chain management is to manage all products, information and financial flow of all participate organizations and departments, from putting order to the final step to reach the customers (Shen, Tao et al., 2000).

The main idea of old supply chain management is to concerning how to move the goods in an efficient way from the producer to customer, focus on how to add values by making use of producers' strength and advantages on production technology and management methods (Lan, Zheng et al., 2000).

However, the e-supply chain management mainly concentrate on the final customers, how to gather information from customers, and how to get information by analyzing the customers' unknown or unsure needs in order to reach the maximized value from sharing information based on internet and electronic. All parts in the chain will become an integration structure, ensure the products in the chain with right market demands. This kind of management pattern can reduce the cost of logistics

management, at the same time can realize the parties of profit coordination, improve the distribution and production efficiency, it is more suitable for small and medium-sized e-commerce enterprises application in the future development (Liu, 2016).

By analyzing different E-commerce logistics models, one conclusion can be drawn. Self-run logistics mode works for an enterprise itself, so it can get rid of the constraints of third party logistics, contact customers directly and ensure to get first-hand information of customer needs in order to increase market share. At the same time, self-run logistics mode can provide high quality logistics service to win customer's trust and to maintain corporate image and credibility of the market (Gu, 2016) However, everything has double sides. Due to the numbers of uncontrolled online trading, for example in the off-season, big waste of materials, human resources and financial resources, obviously increases the risk of self-run logistics operation (Zou & Chen, 2001)

If the e-commerce enterprise business has not reached a certain scale, self-run logistics mode will not be the best solution. It may cause empty transportation, low load rate, traffic congestion, environmental pollution and logistics costs would be too high and have a bad effect on economic benefits of enterprises (Qiu, 2001). In this case, logistics alliance operation mode can be used to fully use the human, time and material resources, reduce logistics cost and improve the effects of logistics services (Cheng, 2001). On one hand, logistics alliance operation mode increase logistics resources, but on the other hand, different participants of the logistics alliance have different markets, reputation, scale, operation mode and other aims, which makes all factors hard to coordinate. If one part breaks the plan, the whole coordination may fail.

Meanwhile, third party logistics, as a very convenient and popular mode, gains a high trust from e-commerce enterprise suppliers, but at the same time, enterprises lose power in logistics price negotiations (Gu, 2016). Since third party logistics have the whole right and responsibilities for all the logistics behavior, it is hard to control their activities. Once there is a problem in third party logistics, the whole logistics system may be broken and quality and efficiency of logistics services can be reduced. The uses of third party logistics influence the satisfaction of customers (Zhang & Zhou, 2006).

Above all, different modern logistics model has its own characteristics, advantages

and disadvantages. To choose what model for running business depends on the enterprise size and development level, the logistics management ability of the enterprise and existing logistics network resources. Also it depends on what are the core and un-core business of an enterprise. (Zou & Chen, 2001)

2.4 Traditional Logistics vs. E-commerce Logistics

If small and medium enterprises want to survive in the increasingly competitive e-commerce market, they must change the traditional logistics management mode, consider all factors in the logistics applications based on their own development actual situation. First of all, they have to understand what the differences between traditional and modern logistics are, and why the modern models will bring benefits. It is not only a revolution on Internet and technology, but also a big change on people's thinking. A comparison of traditional logistics and E-commerce logistics shown below.

Table 1. Comparison of Traditional Logistics with E-commerce Logistics (after Zhang & Feng, 2005)

	Traditional Logistics	**E-commerce Logistics**
Services	Poor facilities, low ability, limited area and department, provide single, individual and one-way services, low quality	Advanced facilities, high quality, cross regional and department, integrated services, value added services
Management	Individually management, cannot control the whole supply chain, product flow together with logistics flow, producer controls, B2B	Integrated management, control the supply chain, product flow separated with logistics flow, customer and information controls, 3rd party becomes important, C2B, C2C, O2O
Information & Technology	No information sharing, low level of technology, half mechanization half manual, limited internet work	High level of mechanization and automation, widely internet and information sharing, high-tech use, EDI, GIS, GPS, RF, etc.
Inventory	Must have	Not necessary
Resources	Not sharing, high risk	Resources integration, low risk, create complementary advantages
Market Reaction	Slow	Fast

Degree of Participation	Low, each enterprise works separately	High, all enterprises work together
Benefit Relationship	Each part concentrates on self-interest maximization, even conflictive	Consistent, create common value through whole supply chain
Stability	Weak, high risk, easy to be replaced	Strong, long cooperation development relationship
Price	High, big waste	Low, less waste

E-commerce Logistics requires all enterprises of the supply chain to create values together by sharing information and it can increase the amount of information and communication. At the same time the enterprises in the whole chain should be totally open to each other, in order to create high quality services, lower cost and to provide customers with best possible service.

2.5 From E-commerce Logistics to Internet+ Logistics

In the year 2015, the idea of Internet+ was announced by the Chinese government, as a new concept and a new direction of the future Chinese e-commerce development and it came into people's sight as a brand new idea. Internet+ means Internet plus all other kinds of traditional industries. Internet+ is an important product innovation under the new economic situation and plays a very important role in the development of e-commerce.

The e-commerce trades make strict requirements for modern logistics, and Internet+ Logistics is seen as an even newer kind of modern logistics. How to use Internet and technologies to match the standard, to improve operational quality and efficiency of logistics become very important topics. Internet+ Logistics is not only to put Internet and logistics together, but to use new information and communication technology, together with an internet platform, to make a better use of social resources. It is a total revolution compared to traditional logistics (Xie & Zhu, 2015). In order to complete the logistics supply chain, to optimize resources management and to reduce costs, the final customer is considered as one part of the chain (Chen, 2015).

Internet+ Logistics comes from E-commerce Logistics. E-commerce is a more international topic, but Internet+ Logistics is more like a Chinese characteristic thing

nowadays. It is new, but with a high development speed. By means of mobility, digitization and specialization, Internet+ Logistics can meet the requirements of flexible supply chain services and promote the efficient flow of goods, realize the rapid response to customers, improve service quality and maximize the value and overall benefit of the whole supply chain. By strengthening cooperation, sharing resources, building platforms and credit system construction, Internet+ Logistics can improve overall competitiveness and synergies of supply chains, strengthen the cooperative partnership between supply chains and enterprises, realize the communication of business flow, capital flow and cash flow and can also reduce logistics cost and increase logistics efficiency. (Wang, 2014)

2.6 Internet+ Logistics Model

2.6.1 O2O Model

The fast development of society, with heavy traffic and limited time for Chinese young persons, people are not satisfied to go out to real stores and shopping malls for buying things. Internet+ Logistics is especially popular in the remote areas, where the physical availability of goods is limited. O2O (online to offline) is a widely used new business model after B2B, B2C and C2C. Development of the O2O is an opportunity caused by Internet and big data. It is not only for trading, producing and manufacturing enterprises, but also very popular among other areas close to people's daily life such as agricultural products, food & beverage, home decoration or medicine. O2O is the main and the most important platform of Internet+ Logistics.

O2O, based on Internet and information, includes logistics information communication, data integration and analysis. Big data and cloud calculation are used to collect customer data and information, make a virtual calculation of social resources, time, cost, delivery time and fastest route, in order to fit customers' needs.

People especially young people use O2O to enjoy a more convenient and faster life. For example, Starbucks, a worldwide well-known coffee brand, serves tasty and good quality coffee. Normally, people go to Starbucks shops to buy and enjoy coffee. But for some office workers, when they want to enjoy a cup of Starbucks coffee but time is limited, Internet+ Logistics becomes the lifesaver. When you want to have products from Starbucks in Beijing, you only need to open the app, choose what you want,

leave your contact data and pay. The Starbucks app will search for the nearest Starbucks shop and make delivery to you in a very short time. After the order you can follow the logistics status, where the courier is and at what estimated time your coffee will be in your hand. After you get your coffee, you can leave feedback for every step in the logistics process. This is just a very simple example of an Internet+ Logistics O2O application.

In China, e-commerce occupies an increasingly larger market share. Big e-commerce enterprises such as Alibaba Group started to build their own Internet+ Logistics platform, named Alibaba Cainiao Network (https://www.cainiao.com), based on a data driven collaborative platform of socialization, the use of big data and cloud calculation. It covers 224 countries and regions all over the world and 2800 towns and districts inside China, receives more than 800,000,000 logistics status massages per day, has more than 3000 partners and 230,000 usable trucks, has designed over 6,090,000 professional routes, occupies more than 70% couriers in China. The logistics personnel reaches 1,700,000 and can achieve 99% logistics precision. Cainiao aims to establish an open, transparent and shared data application platform, together with e-commerce enterprises, logistics companies, warehousing companies, third-party logistics services, supply chain service providers and other kinds of enterprises. Cainiao wants to provide various types of high-quality services, in order to support the development of the logistics industry to reach high value-added and upgrade purposes. By creating a modern Internet+ Logistics network system, Alibaba's aim is to improve the quality of Chinese social logistics service, encourage the establishment of a social resource efficient coordination mechanism and to build China's future business infrastructure. With Cainiao Network, agricultural products broke the traditional multistage distribution and changed the service model from field to table. As shown in this thesis, the NTFPs stores in Tmall are using O2O platform and Internet+ Logistics as the operation model. Sellers and entrepreneurs put their products on Tmall, using the new Internet+ business model.

2.7 Theoretical Framework

Based on the previous understanding and comparison of traditional logistics and modern logistics, described in the theoretical framework part, I will concentrate on some significant characteristics of Internet+ Logistics. To give a further understanding

of Internet+ Logistics I will clarify the theoretical framework from different points of view of Internet+ Logistics, as in different services, cost and payment methods, information and technology, competition and innovation. By knowing the important characteristics, we will have a further understanding of the responsibility of each part in the Internet+ Logistics, in order to give their weight for the next analysis of the NTFPs stores.

2.7.1 Logistics Model & Brand

The logistics model chosen is dependent on the competence within a company as well as the size and focus. If you are a large size company it may be most profitable to organize everything yourself. For smaller one you could either choose to form a logistics alliance with other companies or to outsource the logistics to a third party logistics provider.

2.7.2 Services

In traditional logistics, people think of transferring a product from producer to customer and once the customer get it, the mission is accomplished. Each link within the supply chain only care about its own benefit. B2B business acted as the main stream and final customers are not considered as an important service objective. The only thing connecting customers and producer is basically trading. There is a lack of comprehensive range of connections and wide range of information interaction and an information asymmetry exists (Wang, 2016).

However, with the rapid development of e-commerce in China and the appearance of Internet+ Logistics, customers nowadays have become the most important and most powerful link in the whole supply chain. In other words, everything moving in the supply chain is based on the customer's needs and all the values that Internet+ Logistics create are reflected by the customers' satisfaction. Customer feedback becomes one standard for judging enterprise competitiveness. As a result, the services of logistics will attach great importance to the enterprise competition in the future. The value of services needs to be created by customers together with enterprises.

Furthermore, Internet+ Logistics services not only mean to make the delivery services to customers, but also provide other services for example ensuring quality of product, making good looking and durable packaging, as well as provide a good customer

communication and relationship management.

2.7.2.1 Quality

Quality of Internet+ Logistics does not only mean the quality of delivered products, but also the quality of the whole logistics supply chain. All activities of the supply chain mean to service the final customers, therefore, quality of the logistics decides the satisfaction of customer and at the same time decides how successful the Internet+ Logistics will be (Cheng, 2001). How to grade the quality of logistics is what needs to be considered. Internet+ Logistics services must put customer's satisfaction first, not only provide storage and transportation, but also need to strengthen, value-add and personalize services. For example, goods tracking, automatic goods ordering, barcode system and other high-tech applications may be implemented to increase logistics efficiency and to offer customers market investigation and forecast. Internet+ Logistics aim to give customers good services as well as to build a long and trustable customer relationship with a lower cost (Ma & Deng, 2007).

2.7.2.2 Packaging

Packaging is a very important factor of products and it has a big psychological impact when customer buying. The outside package and partial shipment package are both important, package material, design and durability also need to be considered. To make a good package one has to think in both commercial and industrial way; to protect the product and at the same time to make sales promotion, increase loading rate and to keep an environmentally friendly concept.

2.7.2.3 Tracking System & Customer Services

Under Internet+ Logistics, customers are not an individual existing in the whole business chain, but a group of people who get together by cloud platform and big data. As the most important group of people, to serve them, a good customer service is very important to the Internet+ Logistics process. Having an impeccable product tracking status system is also necessary. Using tracking system, supplier, manufacturer and customers are all beneficiaries. When goods are sent out, there are messages sent to customers for notification, and during goods transportation, customers could track their goods in real-time location by insert tracking code in the Internet+ Logistics system. Tracking can be done in app without putting tracking code, once you register the app and log in, all your buying, shipping, orders and tracking records can be done automatically. After goods arrival, an automatic message will send to your phone. Since in NTFPs, most of the goods are food, this function is very useful.

In the Internet+ Logistics process, customer services are mainly done on the Internet platform with cloud services and big data. Online customer services is a core thing for Internet+ Logistics, a professional logistics services provider need to share information and show data on internet to make sure customers can find and see data at any time they want, real time communication can make sure the data is freshly updated. At the same time, customers have high requirement for their data and information being protected. For the provider of services as well as for the consumers, keeping data and information protected is very important.

2.7.3 Payment Methods

By collecting data from NTFPs online shops in Tmall and after analyzing, all payment of online shop Internet+ Logistics are done by Internet already before shipping. Instead of the cash payment, card payment is also out of fashion. In China, the emerging payment method such as Ali pay and WeChat pay are very widely used, by scan bar code before checking out, goods will be easily and securely paid. Also, installment payment is popular. Gift cards and coupons can be used as well. However, in this study, the NTFPs chosen from Tmall are not using pay on delivery, but in other e-commerce platform it is used. For example in DangDang books e-market, customers can pay their books when goods arrived and after checking. The reason might be because DangDang is only selling books, it is easy to manage. However, Tmall has variety of goods to sell.

2.7.4 Information and Technology

Modern information technology is widely used in Internet+ Logistics operations since all processes are based on cloud platforms and big data. Information and Technology are used in all main managements in Internet+ Logistics, for example for inventory management, automatic replenishment management and tracking system. Online store should provide a fast, convenient and safe information platform, to make sure the whole purchasing and transportation process goes well (Chen, 2015). The most used Information Technology tools Internet+ Logistics are using GIS, RFID and EDI. Besides those, intelligent control technology, system management and automatic guided vehicle are being used as well in the modern logistics services. The use of information and intelligent provides high efficiency of logistics.

2.7.5 Reputation and Feedback System

As Internet+ Logistics concern much about long-term customer relationship management and wants to provide good services to customer, it is important to have a reputation and feedback system. Most of the online shops from Tmall included in this study have a reputation and feedback system. After customers have made their order, during delivery and after receiving products, customers can go to the online grading system to give score to all parts of the logistics, and can also leave messages to Tmall or direct to seller. A reputation and feedback system is good for e-commerce development and logistics improvement.

3. METHODOLOGY

In order to analyze the differences between the shops the TOPSIS (a technique for order preference by similarity to ideal solution) method was chosen (see *e.g.* Yoon (1987) and Hwang *et al.* (1993)). The method is in short to measure the geometric distance for a given alternative to an ideal solution. An indexing system is created, the results are then normalized, and weights are calculated for the indexes. Finally the geometrical distance for each alternative to the target (best alternative) and worst alternative (worst condition) are calculated. Hence, a ranking of the alternatives can be made, but also an evaluation of the indexes.

3.1 Index System for Internet+ Logistics Development

The literature on e-commerce logistics, Internet+ and Internet+ logistics and other relevant theories are taken as the typical literatures for the selection of development level indexes. An evaluation index system of the development level of the Internet+ logistics is established based on the indicators frequently used in these authoritative literatures and the development essence of Internet+ Logistics.

Eight different categories of the logistics system were identified. To some extent they are same as described in section 2.7. For each category subcategories were defined, and for each subcategory different alternatives were given a number. The whole indexing system is presented in table format in Appendix 1.

3.1.1 Logistics Model & Brand

The indexing of logistics model and brand, distinguish the model type as well as the brand used (table 2).

Table 2. Index categories for logistics model and brand

1st Level Index	2nd Level Index	Third Level Index
A Logistics Model & Brand	A_1 Model	A_{11} Self Run=1；Logistics Alliance=2；3rd party=3
	A_2 Brand	A_{21} SF Express =1；EMS =2；Shentong Express =3； YT Express =4；ZT Express =5；Other brands=6

3.1.2 Services

Service is divided into four subcategories: Quality, Package, Tracking status system and Customer services. For each subcategory relevant estimates are chosen according to 2.7 (table 3).

Table 3.Index categories for services

1st Level Index	2nd Level Index	Third Level Index
B Services	B_1 Quality	B_{11} Comparison with Similar Stores
	B_2 Package	B_{21} Material
		B_{22} Special protection
		B_{23} Sample
		B_{24} Special package to keep fresh

		B_{25} Specific recognition
		B_{26} Solid
	B_3 Tracking Status System	B_{31} Reminder when goods sent, duration and arrival=1；Shipping routs tracking =2；Courier open and check when delivery=3
	B_4 Customer Services	B_{41} General rate
		B_{42} Exclusive customer service
		B_{43} 3rd party information (sms message or email)
		B_{44}Real-time online chat
		B_{45} Modify customer info and shipping address online

3.1.3 Promotion

Promotion is important to make a potential customer choose your product. Promotion is divided into two subcategories: Special discount and Information channel. For each subcategory relevant estimates are chosen (table 4).

Table 4. Index categories for promotion

1st Level Index	2nd Level Index	Third Level Index
C Promotion	C_1 Special Discount	C_{11} When reach required amount
		C_{12} Seasonal discount
		C_{13} Membership bonus
	C_2 Information channel	C_{21} By email
		C_{22} By message
		C_{23} By Tmall app

3.1.4 Payment method

The payment methods available are important to make a potential customer choose your products. It should be as hassle free and safe as possible (table 5).

Table 5. Index categories for payment methods

1st Level Index	2nd Level Index	Third Level Index
D Payment Methods	D_1 Payment Pathway	D_{11} Credit card =1；Debit card =2；Ali pay =3；others=4
	D_2 Payment Type	D_{21} Pay on Delivery
		D_{22} Installment
		D_{23} Pay by Others
		D_{24} Gift Card & Coupon

3.1.5 Delivery

For Internet logistics the delivery is a crucial part of the customer service. Within the category four subcategories are identified. First if there is one or several original ports, which is affecting the following logistics. More ports indicate more flexibility. The other subcategories are Delivery Timeliness, Basic elements (free shipping or not) and finally Extra elements which insurance and invoicing (see table 6).

Table 6. Index categories for delivery

E Delivery	E_1 Original Port	E_{11} Single Port=1, Multiple Port=2
	E_2 Delivery Timeliness	E_{21} Normal delivery (Within 24 hours)= 3；Within 48 hours= 2；Longer =1
		E_{22} Flash delivery
		E_{23} Delivery on promise time system
		E_{24} Late delivery insurance
		E_{25} Delivery point warehouse
	E_3 Basic Elements	E_{31}Shipping Price （Free Shipping =1, Self Payment =0）
	E_4 Extra Elements	E_{44} Delivery Insurance
		E_{42} Provide Invoices

3.1.6 Information and technology

As described in 2.7.4 the technology used for keeping the information updated is an essential part of e-logistics. Four different categories were identified (table 7).

Table 7. Index categories for information and technology

F Information and Technology	F_1 Technology Using	F_{11} Bar Code
		F_{12} QR Code
		F_{13} EDI
		F_{14} GPS

3.1.7 Reputation and Feedback system

As described in 2.7.5 the feedback system is important for the trust of the company. The categories are how the feedback and complaining systems are organized (table 8).

Table 8. Index categories for reputation and feedback system

G Reputation & Feedback System	G1 Feedback System	G_{11} Online =1;Offline=2；both=3
	G2 Complaining Chanel	G_{21} Online =1;Offline=2；both=3

3.1.8 General information of store

Finally each store were categorize according to their products, location, e-shop scale, experience of e-shopping, amount of customers and the general platform they were using (table 9).

Table 9. Index categories for general information of stores

H General Information of Stores	H_1 Type of Store	H_{11} Mushrooms
		H_{12} Nuts
		H_{13} Dry Fruits
		H_{14} Fruits
		H_{15} Flower and Plant
		H_{16} Herb
	H_2 Company Location	H_{21} East China
		H_{22} South China
		H_{23} West China
		H_{24} North China
		H_{25} Middle China
		H_{26} Multiple Places
	H_3 E-shop Scale	H_{31} Small（1-30）=1；Medium-sized（31-60）=2；Large（60 and more）=3
	H_4 E-shop experience	H_{41} More than 10 years
		H_{42} 5-10 years
		H_{43} Less than 5 years
	H_5 Customers amount （unit：10,000）	H_{51} Small（0-2）=1；Medium-sized（2.01-4）=2；Large（More than 4）=3
	H_6 General Platform	H_{61} High（higher than 4.80）=3；Medium（4.50-4.80）=2；Low（lower than 4.50）=1

3.3 Data Sources and Sample Description

3.3.1 Data sources

Tmall is a comprehensive shopping website and it has maintained a stable position as the leader of the e-commerce industry. In order to deeply understand the current development level of Internet+ logistics, this study selected NTFPs on Tmall

platform. A total number of 364 shops, including mushrooms, nuts, dry fruits, fruits, flowers, and herb six big types, each type of a random sample of 65 stores, based on the data availability principle，26 stores were cut out, 364 stores left as a final sample. Data index includes logistics model & brand, services, promotion, payment methods, delivery, information &technology, reputation & feedback system and general information of the stores.

3.3.2 Sample Description

Among the 364 sample stores, there are six categories, average number of stores in each category is 60.67. Among them, the store number under fruit category has the most number of 62, mushrooms and herb has the least number of 60 stores. From the location of company, multiple location companies have the largest number of 132. West China has the least number of 23. From the scale of the online store (measured by the number of goods in store), there are 168 large stores, 79 medium-sized stores. According to the experience of the online store, the number of stores operating for 5 years or less is the largest, 248, the number of stores with more than 10 years operating experience is the least, 16. Based on the number of online store customers (measured by the number of followers of store), the number of stores with fewer customers is the largest, 202. The number of stores with high customer volume is the least, 73. From the point logistics score, the number of stores with high score is the most, 258 stores, the low score has the least store number of 19.

3.4 Research Methods

3.4.1 Build an evaluation model of Internet+ Logistics

First of all, to determine the weight of the index for the development level of the Internet+ logistics and calculate each value through entropy analysis. As an objective weighting method, entropy analysis can not only determine the index weight according to the magnitude of the index data change, but also avoid the influence of extreme value on the index weight.

Secondly, to determine the ranking of evaluated objects, the TOPSIS method is adopted to process and sort the data, it is a method to define the ideal solution and the negative ideal solution of the problem, compares the distance between the evaluation

scheme with ideal solution and negative ideal solution, in order to calculate the relative closeness between the different evaluated schemes and the ideal solution, so as to rank the advantages and disadvantages of the solutions and obtain the final result (Cao & Zeng, 2014)

Finally, to determine the interaction relationship between logistics score and its influence factors, factor which influences logistics score is not a single one, by using cross analysis method, we can get two or more than two related variable values into a statistical table, make each variable value becomes a node of different variables, in order to analysis the correlation between variables, and then draw a scientific conclusion.

3.4.2 Entropy Analysis

3.4.2.1 Standardized processing of raw data

In order to avoid the negative and positive of dimension and index effect on the evaluation results, the fuzzy membership method is used to standardize the indexes.

The d[th] membership value of the i[th] evaluation object index is set as x_{di}, set the dth value of the index of the ith evaluation object as v_{di}, m is the number of objects to be evaluated. The following standardized formula is used to standardize the indexes:

$$x_{di} = \frac{v_{di} - \min_{1 \le i \le m} v_{di}}{\max_{1 \le i \le m} v_{di} - \min_{1 \le i \le m} v_{di}} \qquad (3.1)$$

3.4.2.2 Use entropy analysis to calculate weight

Set $s_{ij(i=1,2,\ldots,;j=1,2,\ldots,n)}$ as the jth data in the i[th] store. The more stores we collect, the more objective result we will get, the comparative effect of the index in the whole study is bigger. This means that index is more important and contains more information.

Calculate as below:

(1) Calculate the entropy value

Set e_j as the entropy value of the jth evaluation index, then

$$f_{ij} = \frac{s_{ij}}{\sum_{i=1}^{m} s_{ij}} \qquad (3.2)$$

$$e_j = -\frac{1}{\ln n} \sum_{i=1}^{m} f_{ij} \ln f_{ij} \qquad (3.3)$$

where

f_{ij} represents in the ith store, jth data's proportion.

$s_{ij}$is the jth observation data of the ith store$(i = 1,2, \dots, m; j = 1,2, \dots, n)$;

$\sum_{i=1}^{m} s_{ij}$ is the sum of all the jth proportion in all the stores.

(2) Calculate the entropy weight

Set w_j as the entropy weight of the jth data, calculate as below:

$$w_j = \frac{1 - e_j}{n - \sum_{i=1}^{n} e_i}, j = 1,2, \dots, n \qquad (3.4)$$

3.4.3 Topsis Evaluation Model

3.4.3.1 Weights of standardized data

Set the weight of dth third level index in the ith store as Z_{di}, the standardized data of dth third level index in the ith store is x_{di}, the entropy weight of the dth third level index in the second level is set as μ_d, based on the rule of weights for standardized data, calculate as

$$Z_{di} = x_{di}\mu_d \qquad (3.5)$$

3.4.3.2 Define the ideal solution and negative ideal solution of the evaluated store

Set Z_d^+ as the maximum value of the dth index, set Z_d^- as the minimum value of the dth index, d=1,2,…,41, calculate as below:

$$Z_d^+ = \max_{1 \le i \le 364}(Z_{di}) \qquad (3.6)$$

$$Z_d^- = \min_{1 \le i \le 364}(Z_{di}) \qquad (3.7)$$

From the formulas above we know that, the ideal solution of the evaluated object is $Z^+ = (Z_1^+, Z_2^+, \dots, Z_n^+)$, the negative ideal solution is $Z^- = (Z_1^-, Z_2^-, \dots, Z_n^-)$.

3.4.3.3 Measure the Euclidean distance between the evaluated store and the ideal solution

g_i^+ is defined as the Euclidean distance between the ith store and the ideal solution, and g_i^- is defined as the Euclidean distance between the ith store and the negative ideal solution, so

$$g_i^+ = \sqrt{(Z_1^+ - Z_{1i})^2 + \cdots + (Z_n^+ - Z_{ni})^2} \quad (3.8)$$

$$g_i^- = \sqrt{(Z_1^- - Z_{1i})^2 + \cdots + (Z_n^- - Z_{ni})^2} \quad (3.9)$$

3.4.3.4 Calculate relative closeness

Set the closeness of the ith store's third level index standardized value with the ideal solution as C_i^j, calculate as

$$C_i^j = \frac{g_i^-}{(g_i^+ + g_i^-)} \quad (3.10)$$

In the formula, $i = 1,2,\ldots,364; j = 1,2,\ldots,41$. When $j = 41$, C_i^{41} represents in the index system for Internet+ logistics development, the closeness of 41th index with the ideal solution among the total seven first level indexes.

According to the TOPSIS analysis, the relative closeness is calculated to clarify the development status of the stores. If the value of relative closeness is larger, the gap between the store and the ideal solution is smaller, and its development is better and more scientific. Using the relative closeness result, we can get the comprehensive ranking of the stores.

4 RESULTS

4.1 Weight Analysis for Internet+ Logistics index based on Entropy Analysis

4.1.1 Standardizing the original data

Each index category for the 364 stores were collected and put into a matrix (Appendix 2). For each category the standardized value were then calculated according to equation (3.1) and put into a new matrix (Appendix 3). Standardized data will reduce the impact of extreme values on the overall data results.

4.1.2 Calculation of the Weight for Each Index Level

In order to calculate the weight for each index level the original values were put into formulas (3.2) (3.3) (3.4), to get the weight. For example the weight of A_{11} is calculated by

$w_j = \frac{1-0.356}{41-26.263} = 0.0437$, and the result is put into a matrix (table 10, row 1 column 6).

Similarly, the weight W_j of every other index is obtained and listed in Table 10, column 6. The entropy weight calculation results of first and second layer are presented in the 2nd and 4th columns.

Table 10. Entropy Weight of Tmall NTFPs Stores Index under Internet + Logistics

(1) 1st Level Index	(2) Entropy Weight	(3) 2nd Level Index	(4) Entropy Weight	(5) 3rd Level Index	(6) Entropy Weight
A Logistics Model & Brand	0.0793	A_1 Model	0.0437	A_{11} Self Run=1；Logistics Alliance=2；3rd party=3	0.0437
		A_2 Brand	0.0356	A_{21} SF Express =1；EMS =2；Shentong Express =3； YT Express =4； ZT Express =5；Other brands=6	0.0356
B Services	0.3819	B_1 Quality	0.0486	B_{11} Comparison with Similar Stores	0.0486
		B_2 Package	0.1656	B_{21} Material	0.0374
				B_{22} Special protection	0.0138
				B_{23} Sample	0.0290
				B_{24} Special package to keep fresh	0.0392
				B_{25} Specific recognition	0.0029
				B_{26} Solid	0.0433
		B_3 Tracking Status System	0.0112	B_{31} Reminder when goods sent, duration and arrival=1； Shipping routs tracking =2； Courier open and check when delivery=3	0.0112
		B_4Customer Services	0.1565	B_{41} General rate	0.0434
				B_{42} Exclusive customer service	0.0328
				B_{43} 3rd party information(sms message or email)	0.0180
				B_{44} Real-time online chat	0.0398
				B_{45} Modify customer info and shipping address online	0.0224
C Promotion	0.1613	C_1 Special Discount	0.0978	C_{11} When reach required amount	0.0360
				C_{12} Seasonal discount	0.0325
				C_{13} Membership bonus	0.0293
		C_2Pushing Information	0.0634	C_{21} By email	0.0192
				C_{22} By message	0.0237
				C_{23} By tmall app	0.0205
D Payment Methods	0.1301	D_1Payment Pathway	0.0356	D_{11} Credit card =1；Debit card =2；Ali pay =3；others=4	0.0356
		D_2 Payment Type	0.0945	D_{21} Pay on Delivery	0.0313
				D_{22} Installment	0.0391
				D_{23}Pay by Others	0.0117
				D_{24}Gift Card & Coupon	0.0124
E Delivery	0.1789	E_1 Original Port	0.0226	E_{11} Single Port=1；Multiple Port =2	0.0226
		E_2 Delivery Timeliness	0.1075	E_{21} Normal delivery (Within 24 hours)= 3；Within 48 hours= 2；Longer =1	0.0163
				E_{22} Flash delivery	0.0280
				E_{23} Delivery on promise time system	0.0260
				E_{24} Late delivery insurance	0.0152
				E_{25} Delivery point warehouse	0.0220
		E_3 Basic Elements	0.0179	E_{31} Shipping Price （Free Shipping =1, Self Payment =0）	0.0179
		E_4 Extra Elemets	0.0310	E_{41} Delivery Insurance	0.0100
				E_{42} Provide Invoices	0.0209
F Information and Technology	0.0665	F_1 Technology Using	0.0665	F_{11} Bar Code	0.0064
				F_{12} QR Code	0.0121
				F_{13} EDI	0.0220
				F_{14} GPS	0.0260
G Reputation & Feedback System	0.0020	G_1 Feedback System	0.0010	G_{11}Online =1;Offline=2； both=3	0.0010
		G_2 Complaining Chanel	0.0010	G_{21}Online =1;Offline=2； both=3	0.0010

As we can see from Table 10, "B_{11} Comparison with Similar Stores" has the largest weight in the 3rd layer, which indicates that customers pay more attention to this factor in their evaluation of store logistics mode. In the 2nd layer, B4 Customer Services counts for the largest proportion. Compared with other factors, the kind of service the store can provide to customers is the focus of customers' attention and also the key point for the survival of the store. Among the seven criteria layers in the

whole index system, “B Services” has the largest weight, and the value is much higher than other criteria layers, which fully demonstrates the importance of Services in the Internet+ Logistics model.

4.2 Result of the Final Scores of the Selected Online NTFPs Stores Based on Topsis Analysis

4.2.1 Weighted Processing of Standardized Data

By using the standardized values (Appendix 3) in formula (3.5) the weighted results of standardized data are obtained (Appendix 4). Then we get weighting of each index under Internet+ Logistics, in order to understand which index plays a more important role among all logistics factors for the same store.

As an example of the weighted indexes store 1 (Chu Pin Yuan) is used (Table 11). From the result we can see, A_{11}, (Logistics model) weight is 0.044, takes relative high proportion among all indexes, $B_{41,}$ (Service general rate) weight is 0.042 ranks at the second place. $B_{22,}$ $B_{25,}$ $D_{23,}$ (Package special protection, Package special recognition, Payment method pays by others) and some other index weights are 0, but it doesn’t mean there is no meaning of these indexes, but these logistics factors did not take a big proportion among the overall logistics performance. By understanding this, a store will know in the future which parts of the logistics performance that need to improve.

Table 11. Weighed indexes for Store 1 ((Chu Pin Yuan)

Index A-B	Weight	Index C-D	Weight	Index E-G	Weight
A_{11}	0.044	C_{11}	0.036	E_{11}	0.023
A_{21}	0.036	C_{12}	0.033	E_{21}	0.000
B_{11}	0.016	C_{13}	0.000	E_{22}	0.028
B_{21}	0.025	C_{21}	0.000	E_{23}	0.026
B_{22}	0.000	C_{22}	0.024	E_{24}	0.000
B_{23}	0.029	C_{23}	0.021	E_{25}	0.000
B_{24}	0.039	D_{11}	0.036	E_{31}	0.018
B_{25}	0.000	D_{21}	0.031	E_{41}	0.000
B_{26}	0.022	D_{22}	0.039	E_{42}	0.000
B_{31}	0.011	D_{23}	0.000	F_{11}	0.000
B_{41}	0.042	D_{24}	0.000	F_{12}	0.000
B_{42}	0.033			F_{13}	0.022
B_{43}	0.018			F_{14}	0.000
B_{44}	0.040			G_{11}	0.000
B_{45}	0.022			G_{21}	0.000

4.2.2 Determining the ideal solution

The maximum and minimum values of the columns of the standardized values (Appendix 3) are based on formulas (3.6) (3.7). The maximum value of the standardised values can be used in formula (3.8) to get the ideal solution of each

evaluation index g_i^+. Similarly, the negative ideal solution g_i^- of each evaluation index can be obtained by the minimum values and formula (3.9).

4.2.3 Calculation and Ranking of the Relative Closeness for Each Store with the Ideal Solution

By utilizing the standardized values (Appendix 3) and formulas (3.8) (3.9) (3.10) we can evaluate the first layer of the criteria such as Logistics Model & Brand and the relative closeness of 364 stores with the ideal solution. The ranking was conducted according to the relative closeness. The smaller the relative closeness value is, the better development status of the store will be. Shown in Table 12.

Table 12. Comprehensive Result and Ranking of the Development of Internet+ Logistics for Each Store

Store	S1	S2	S3	S4	…	S251	S252	S253	…	S361	S362	S363	S364
RelativeCloseness	0.538	0.525	0.564	0.542	…	0.561	0.500	0.515	…	0.464	0.478	0.426	0.454
Ranking	139	200	59	121	…	117	69	308	…	351	347	364	358

The comprehensive evaluation result of 364 NTFPs stores in Tmall in terms of Internet+ Logistics are as follow. Overall, the top three ranking stores are Hong Yue (S202), Huo Zhi Bao (S209) and Tian Jian Xiao Jing (S205). The last three stores are Gao Yuan Song (S355), Bei Le Zi (S354) and Ai Ke Da (S363). The top three shops are all in the flower category, while two of the bottom three shops are in the fruit category. In terms of store types, 93% of the top 30 stores are flower stores, 2% are mushroom stores, and the remaining 5% are other types. Among the bottom 30 stores, 45% are herb stores, 33.3% are fruit store, and the rest are flower and dry fruits. To summarize, the ranking and development of flower stores have a polarization phenomenon, which is either very good or very bad. The overall development of fruit stores is in a poor position among the six categories, the logistics score of all stores are not high. Most of the mushroom stores are ranking in the middle position.

4.3 Overall Comprehensive Evaluation Based on Cross Analysis

For the convenience of research, we divided the scale of online stores into different levels according to the number of products sold in the stores: 1) represents small scale, 2) represents medium scale and 3) represents large scale. The online store competence and experience is according to the operating years: 1) represents less than five years, 2) represents five years to ten years and 3) represents more than ten years. The number of online store customers are according to the number of followers, and is

also divided into three levels: 1) means a small number of customers (0-20,000), 2) means a medium number of customers (20,001-40,000) and 3) means a large number of customers (more than 40,000). The logistics grade score is also divided into three pools: 1) means low score (lower than 4,5), 2) means medium score (4,5-4,8) and 3) means high score (higher than 4,8).

4.3.1 Cross Analysis for Logistics Score and Type of Stores

Among the 22 stores with logistics score of 1, there are 11 fruit stores (50%), 0 nuts store (0%). There are a total of 85 stores with logistics score 2, among which 32 are fruit stores (37.65%) and 3 stores are nuts stores (3.53%). There are 257 stores with a logistics score of 3, including 16 fruit stores (6.23%), 65 nuts stores (25.29%) as shown in table 13. The results of cross analysis show that with the increasing of logistics score, the proportion of nuts stores is increasing and the proportion of fruit stores is decreasing.

Table 13. Cross Analysis for Logistics Score and Type of Stores

		Type of Stores					
		Mushroom	Nuts	Fruits	Flower	Herb	Total
Logisitics	1.00	7	0	12	1	2	22
Score	2.00	5	9	32	33	6	85
	3.00	50	115	18	28	46	257
Total		62	124	62	62	54	364

4.3.2 Cross Analysis for Logistics Score and Company Location

There are 22 stores with a logistics rating of 1, among which 7 stores are located in west China (31.82%), and 7 in middle China, (31.82%). When the logistics score level is 2, there are a total of 85 stores, among which 29 are in west China (37.66%), and 22 stores are in middle China (25.88%). There are a total of 257 stores with a logistics score of level 3, 73 stores in west China (28.40%), and 54 in middle China (21.01%) (table 14). The results of cross analysis show that with the improvement of logistics score grade, the proportion of the company's location in the central region keeps decreasing, and the proportion in the western region reaches the peak when the logistics score grade is 2. Northeast China has the most companies.

Table 14. Cross Analysis for Logistics Score and Type of Company Location

		Company Location				
		East	West	Middle	Northeast	Total
Logistics Score	1.00	5	7	7	3	22
	2.00	23	29	22	11	85
	3.00	50	73	54	80	257
Total		78	109	83	94	364

4.3.3 Cross Analysis for Logistics Score and Store Scale

There are 22 stores with a logistics score 1, among which 14 are small size (63.64%), medium size has 0 store (0%), and 8 are large size (36.36%). There are a total of 85 stores with a logistics score 2, among which 33 are small size stores (33.82%), 11 are medium size (12.94%) and 41 are large size (48.24%). There are a total of 257 stores with a logistics score of 3, among which 78 are small size stores (30.35%), 59 are medium size stores (22.96%), and 120 are large size stores (46.69%), (as shown in table 15). The results of cross analysis show that, with the increase of logistics score level, the proportion of small online stores continues to decrease.

Table 15. Cross Analysis for Logistics Score and Store Scale

		Store Scale			
		Small	Medium	Large	Total
Logistics Score	1.00	14	0	8	22
	2.00	33	11	41	85
	3.00	78	59	120	257
Total		125	70	169	364

4.3.4 Cross Analysis for Logistics Score and Store Qualification

Among the 22 store which logistics score is 1, 20 stores are with less than five years operation experience (90.91%), 2 stores are with five to ten years' experience (9.09%), and none is with more than ten years' experience. When the logistics score is 2, there are a total of 85 stores, among which 63 are less than five years operation experience (74.12%), 17 are more than five years (20%) and 5 are more than ten years (5.88%). There are a total of 257 stores with a logistics rating of 3, among which 164 are less than 5 years (63.81%), 81 are from 5 to 10 years (31.52%), and 12 are more than 10 years (4.67%) (shown in table 16). The result of cross analysis shows that, with the increasing of logistics score, the proportion of online store qualification of less than five years is decreasing, while the proportion of online store qualification of five to ten years is increasing.

Table 16. Cross Analysis for Logistics Score and Store Qualification

		Store Qualification			
		Less than 5 years	5-10 years	More than 10 years	Total
Logistics Score	1.00	20	2	0	22
	2.00	63	17	5	85
	3.00	164	81	12	257
Total		247	100	17	364

4.3.5 Cross Analysis for Logistics Score and Customer Amount

Among the 22 stores which have logistics score of 1, 15 are with a small amount of customers (68.18%), 4 are with a medium amount of customers (18.18%) and 3 are with a large number of customers (13.64%). There are a total of 85 stores with logistics score 2, among which 46 stores with a small number of customers (54.12%), 20 stores with a medium amount of customers (23.53%) and 19 stores with a large number of customers (22.35%). There are a total of 257 stores with a logistics score 3, among which 128 stores with a small amount of customers (49.81%), 59 stores with a medium number of customers (22.96%), and 70 stores with a large number of customers (27.24%) (shown in table 17). The results of cross analysis show that with the improvement of logistics score, the proportion of stores with a small amount of customers in the online store is decreasing, while the proportion of stores with a large number of customers in the online store is increasing.

Table 17. Cross Analysis for Logistics Score and Customer Amount

		Customer Amount			
		Small	Medium	Large	Total
Logistics Score	1.00	15	4	3	22
	2.00	46	20	19	85
	3.00	128	59	70	257
Total		189	83	92	364

To sum up, with improving logistics score, the proportion of different types of online stores change greatly, among which the two types of stores, dried fruit and fruit, have the most significant changes. The location of the company also changes accordingly. The higher the logistics score, the proportion of the western region starts to decrease,

and the proportion of the central region starts to increase. The proportion of large online stores are higher for higher logistics scores. When logistics score increased, the proportion of stores with less than five years of operation time decreases, while the proportion of stores with five to ten years of operation time increased. Finally, for the customer amount, the larger customer amount the store has, the higher logistics score.

5. CONCLUSION AND DISCUSSION

E-commerce models are widely used in China. Logistics, an important link of Internet e-commerce operations, has to change from traditional models to modern ones. Traditional logistics models have gone far, they cannot adapt to the development of the present level of e-commerce. Consumers will see the advantages of new and multi-type Internet+ Logistics models (Chen, 2015). This study is not only to know the weight for different Internet+ Logistics indexes, but also to find out what implications it have for future research, what are the possibilities of Internet+ Logistics and what kind of opportunities it will bring to future business.

From the entropy analysis we can conclude that Service (Index B) has the highest weight from all selected indexes of Internet+ Logistics. Logistics service has a big relationship with customer satisfaction, since customer satisfaction is important for a store's business, they need to ensure all customer satisfaction related aspects. Logistics services need to meet customers' needs and demands in different ways and by satisfying customers, a store will increase its reputation and competition ability. This is why service has the most weight.

From TOPSIS analysis we got store Hong Yue flower has a best score. Flowers need to be delivered fresh, so a flower shop needs to have a high standard of logistics chain. It needs to invest more in technology and packages to shorten delivery time in order to keep flowers fresh for the customers. The high quality logistics brings customers a better shopping experience and they enjoy a good service. Since service has the largest weight, it gives a big influence on the final score. The TOPSIS method is a common method for finite scheme multi-objective decision analysis. It is a widely used method and has no special requirement for data and it is flexible and simple. Therefore, this study use this method to evaluate logistics index system to measure its comprehensive ranking, and then analyse the logistics operation and management of different types of stores to find existing problems, to give future rationalization proposals.

Furthermore, from cross analysis, we know that nuts stores have the highest amount with highest score, because nuts are dry goods which have long expiration time and

are easy to transport. Nuts have a relative low demand for logistics and packages and when customers purchase nuts they can always get a high satisfaction. On the opposite, fruits stores have the smallest number of stores with high score, because fruits need special protection, package and storage during transportation, they need to keep fresh and fruits have a relatively high demand on logistics The fruit stores need to make improvement in the future to get a better logistics feedback. From the company location side, stores locate in northeast China have the highest scores and stores located in eastern China have the lowest scores. Shops in northeast China have put more effort in developing Internet+ Logistics in order to strengthen technology and services, as well as NTFPs are an important part of economics in northeast part of China. This is also one reason that people have put quite much effort into developing NTFPs online stores, and hence they have a better score.

From the result of cross analysis of logistics score with store scale, experience and customer amount we can see, large stores always have higher logistics performance score, because most of large stores have a complete service system, high quality products and fast logistics speed. One reason could also be that the larger the store, the larger is the average deliverance distance, and hence the dependence on the logistics chain. Stores with more than 5 years open time have bigger percentage of high scores than the ones open less than 5 years. Explained when store open time is longer, logistics supply chain is more complete, which can provide customers various kinds of products and better services. Younger stores need to do more to maintain customer relationship and to improve their services. Besides, Stores have fewer customers get better scores than stores have bigger number of customers. Because fewer customers will give less feedback, people cannot find much problem on logistics services. On the other hand, stores that have a large amount of customers will have more feedbacks, and may be exposed to more logistics problems, which may be a reason they have lower scores.

Using Internet+ Logistics models and O2O platforms, NTFPs producers can sell products in online stores directly to final customers. Customers can search on Internet NTFPs based on their needs. Through cloud and big data, producers can see the needs in order to know what kind of products the market needs the most. By avoiding middlemen in the process, customers can buy products with lower price but get

relatively better services directly from producers. At the same time, producers can sell their products to customers without adding any middlemen's profit. It is a win-win situation for both NTFPs producers and final customers and it is a big advantage for NTFPs producers, since the NTFPs producers mostly live in mountainous areas close to forests, the main marketing way is to pick first and then sell. By using Internet+ Logistics, the local producers may improve their life and production, catch up the information flow trend, have big potential to produce, process, manufacture, and to sell products. As China has numerous varieties of NTFPs, each with a large amount, the opportunity of Internet+ is not only positive for the domestic market, but will also be an advantage on the international market.

My result implies that the advantages of Internet+ Logistics, which are mentioned in chapter two together with the results from this study, will let us know how to make further development of modern logistics. To strengthen logistics services, to better control the whole supply chain and to improve the level of mechanization and automation are areas to further improve. High tech is always requested to lower the cost and risk. The more completed the Internet+ Logistics chain, the better it will fit the Chinese high economics developing speed.

In addition, the use of Internet+ Logistics nowadays will give a further development to modern logistics in the future. For example the use of fourth party logistics and unmanned aerial vehicle (UAV). Fourth party logistics is an outcome of extensive using of third party logistics. It doesn't take any logistics operation activities, only provide services to first party, second party and third party logistics as an agent. The development of fourth party logistics will make an integration of transportation services, cargo agents, customer service providers and even taken the third party logistics enterprises' resources and capabilities. A unified coordination management of the enterprise logistics process. However, there are things that need to be considered, for example the fourth party logistics route, how to find a route of the minimum cost with constraints under uncertain environments.

Unmanned aerial vehicle (UAV) as the future trend is researched and developed in China nowadays. JD Group has already launched the first unmanned warehouse. This warehouse using solar power as energy. The whole logistics processing in the

warehouse is achieved by unmanned management, from entering warehouse inspection, storage, and packaging to sorting. Artificial intelligence and dehumanization through the whole system, is a milestone for logistics industry. In this case, the UAV will become a future development trend, which will help the NTFPs logistics reach a new height.

However, this study has some limitations. NTFPs stores are chosen by rank in Tmall platform, if we choose more categories, there are lots of other NTFPs species in China, for example, Chinese medicines, bamboo products. The study methods I use in this thesis are also suitable for analyzing other kinds of NTFPs on using Internet+ Logistics. The more varieties we use for the analysis, the more reliable result we will get. Beyond this limitation, I have searched all information and data online and I have to trust the online store information. As I am far from the real market, I cannot know if they are true or not. Characteristics of Internet+ Logistics are systematic and networked, in this thesis, my aim designed to analysis online stores, so this study focuses only on the online operation links of logistics behavior and ignores the offline ground logistics management parts, such as how to combine management with online stores and traditional stores. The future opportunity of Internet+ Logistics is to link the physical ground network with the virtual information Internet in order to produce enhanced business opportunities.

6. REFERENCES

Aldin, N & Stahre, F. (2003). Electronic commerce, marketing channels and logistics platforms—a wholesaler perspective. European Journal of Operational Research 144, 270-279.

Cao Shuyan & Li Zhenxin. (2013). A study of cross board e-commerce and third party logistics models. Electronic business, (3), 23-25. [in Chinese, English abstract]

Chen Lequn & Xie Zhizhong. (2007). Supply chain management mode analysis of agricultural products logistics development in our country. Science and Industry, 7(3), 37-41. [in Chinese , English abstract]

Chen Guoquan. (1999). Supply chain management. China soft science, (10), 101-104.[in Chinese]

Chen Jianxin. (2015). Transformation analysis from traditional logistics management to modern supply chain model. E-commerce, (10), 45-46. [in Chinese]

Cheng Guang & Zhao Jinghe. (2016). Where is the way of logistics industry under Internet+ times. China automatic identification technology, (6), 68-70. [in Chinese]

Cheng Hong. (2001) E-commerce logistics model analysis. Journal of university of electronic science and technology (social science edition), 3. [in Chinese]

Cui Yuqing & Xu Xiuying. (2011). Study on Industry Development of NTFP in Zhejiang Province. Issues of forestry economy, 31 (02) : 131-136. [in Chinese, English abstract]

Cui Zhongfu. (2015). A new trend of development for e-commerce logistics under the "Internet" new economy. Logistics technology and application, 4 (7), 54-55. [in Chinese]

Ding Kai, Jiang, Pingyu & Su Shilong. (2018). RFID-enabled social manufacturing system for inter-enterprise monitoring and dispatching of integrated production and transportation tasks. Robotics and computer-integrated manufacturing, 49, 120-133.

Fang Yansheng, Jiang Shengjie & Dong Xianfeng. (2011). Logistics management innovation under the e-commerce environment. Research productivity, 6, 166-167. [in Chinese]

Gong Pu. (2012). Research on agricultural product network marketing issues related to our country. Central China normal university. Master thesis. [in Chinese, English abstract]

Gong Xianglin & Yang Rong. (2012). "Cloud computing" and "cloud logistics" in the application of the logistics. China's circulation economy, 26 (10), 29-33. [in Chinese]

Gu Jingying. (2017). Electrical business logistics operation models analysis. Modern marketing (6), 254. [in Chinese]

He Yong & Liu Congjiu. (2006). Logistics models study for Chinese enterprises. Logistics technology (3), 1-3. [in Chinese]

Hua Yongjian. (2015). Logistics platform competition strategy analyses under the background of "Internet+". Special zone economy, (11), 126-128. [in Chinese]

Hou Jingchao. (2017). Electronic commerce logistics service innovation and improvement under the age of "Internet+". Market modernization, (9), 71-72. [in Chinese]

Hwang C.L., Lai Y.J. & Liu, T.Y. (1993). A new approach for multiple objective decision making. Computers and Operational Research. 20 (8): 889–899.

Ieva M, Artūras A & Michail L.(2014). Consumer satisfaction with the quality of logistics services. Procedia - Social and Behavioral Sciences 110 (330 – 340).

James M. Kenderdine, Paul D. Larson, (1988). Quality and logistics: A Framework for Strategic Integration. International journal of physical distribution & materials management, 18(6), 5-10.

Jiang Bin & Edmund Prater, (2002). Distribution and logistics development in china: The revolution has begun. International Journal of Physical Distribution & Logistics Management, 32(9), 783-798.

John C, Stefano B, Sui L.K, Andy S, Shaily S & Marc D. (2016). E-Commerce Trends and Challenges: A Logistics and Supply Chain Perspective.Asia Pacific White Papers Series. 78p.

Kai Ding, Pingyu Jiang & Shilong Su, (2018). RFID-enabled social manufacturing system for inter-enterprise monitoring and dispatching of integrated production and transportation tasks. Robotics and Computer-Integrated Manufacturing 49, 120-133

Kenderdine, J. M., & Larson, P. D. (1988). Quality and logistics: A framework for strategic integration. International Journal of Physical Distribution & Materials Management, 18(6), 5-10.

Lan Boxiong, Zheng Xiaona & Xuxin. (2000). Supply chain management of e-commerce. Chinese Journal of Management Science, 8 (3). 1-7. [in Chinese]

Li Gang, Chi Guotai & Cheng Yanqiu. (2011). Evaluation model and empirical study of human all-round development based on entropy weight and TOPSIS. Journal of Systems Engineering, 401-407. [in Chinese, English abstract]

Li Jingjing. (2016). On the supply chain management under the influence of Internet. Heilongjiang Science. [in Chinese, English abstract]

Li Xiaoling & Zhang Weina. (2010). Traditional wholesale market for agricultural products develo modern logistics models. Logistics technology, 29 (9), 25-27. [in Chinese, English abstract]

Li Jingjing. (2016). Introduction to supply chain management under the

influence of the Internet. Science in Heilongjiang province, (22), 142-143. [in Chinese]

Li Yang & Wang Yati. (2017). Non-wood forest products green supply chain research review. Journal of forestry economy, (6), 42-48. [in Chinese English abstract]

Lin Qing. (2017) Logistics 3.0- Internet+ open a new era of intelligent logistics.(2-11,29-34,47-57,96-114)

Liu Si. (2016). A study on the small and medium-sized enterprise logistics management model based on "Internet+". Market modernization, (26), 36-37. [in Chinese]

Ma Junsheng & Deng Yongsheng. (2007). A comparison of modern logistics and traditional logistics. Logistics technology, 6, 114-116. [in Chinese, English abstract]

Pu Yongping. (2005). The fourth party logistics theory and its application research. Jiangsu university, master thesis. [in Chinese]

Qiu Dongyang. (2001). A discussion on eight electronic business logistics models. China's circulation economy, 1 (4), 6. [in Chinese]

Rao Kant & Richard R.Young. (1994). Global supply chains: Factors influencing outsourcing of logistics functions. International Journal of Physical Distribution & Logistics Management, 24(6), 11-19.

Sandelowski, M. (2000). Combining qualitative and quantitative sampling, data collection, and analysis techniques in mixed-method studies. Research in Nursing & Health, 23(3), 246-255.

Shen Houcai, Taoqing & Chen Yibo. (2000). Supply chain management theory and methods. Chinese Jounal of Management Science, 8 (1), 1-9. [in Chinese]

Song Juanjuan. (2006). Characteristics of agricultural products logistics and related studies. China Southwest normal university, master thesis. [in Chinese]

Song Yaohua & Hou Hanping. (2004). A discussion of traditional logistics and modern logistics. Journal of Beijing jiaotong university, social sciences, 3 (1), 10 -16. [in Chinese, English abstract]

Stemler, Steve (2001). An overview of content analysis. Practical Assessment, Research & Evaluation, 7(17).

Sun Yongbo & Wang Daoping. (2007). Research on the fourth party logistics operation mode and development trend in China. Journal of Beijing technology and business university (social science edition), 6 (11). [in Chinese]

Tian Xue, Niu Pengfei & Wang Chen. (2016). The age of the Internet logistics freight industry cod model, problem and countermeasure of economics times, (30) : 38-40. [in Chinese]

Wang Chenglin. (2017). Logistics technology application in the Internet age. Leadership science BBS, (6) , 42-55. [in Chinese]

Wang Dajiang & Zhou Qingmin. (2007). A new method of multi-index comprehensive evaluation. Journal of statistics and decision making, (7), 137-138. [in Chinese]

Wang Ning & Huang Liping. (2005). A Study on Agricultural Product Logistics Supply Chain Management Mode based on Information Network. Research of Agricultural Modernization, 26 (2), 126-129. [in Chinese, English abstract]

Wang Jixiang. (2014). Logistics 4.0: Chinese logistics Internet era unfolds open. Logistics technology and application, (10), 76-80. [in Chinese]

Wang Qifeng. (2016). The Mechanism and Implementation Strategy for Logistics Services Value Co-creation in Internet+ Environment. Logistics division technology (11), 1-5. [in Chinese, English abstract]

Wang Qifeng, (2017). Logistics Service Value Co-creation and Service Innovation in Internet+ Environment. 153p. [in Chinese]

Wang Xuehao. (2016). Dried fruit agricultural products e-commerce logistics development countermeasures study in Xinjiang. Journal of labor safeguard world(32), 41,42. [in Chinese]

Wang Xinguo. (2013). The Internet technology application analysis and prospect in the field of logistics. Net work & communication, (22), 52-53. [in Chinese]

Wendy Leeds-Hurwitz.(1995). The Guilford Press, A divison of Guilford Publications, Inc. 72 Srping Street, New York, NY10012. 49-62.

Xi Chongbin. (2016). "Internet+" promotes logistics industry's changing. Logistics technology and application, (5) : 95-97. [in Chinese]

Xie Sixin & Zhu Hao. (2015). "The belt and road" strategic framework based on "Internet+" logistics development model and strategy. Railway procurement and logistics, (10), 53-56. [in Chinese]

Xiong Yazhou. (2005). China's logistics industry information model research. Wuhan Technology University Master degree thesis. [in Chinese, English abstract]

Xu Jinju & Wang Yamin. (2017). Influence of "Internet+" on logistics information system. Logistics technology, (02) : 29-31. [in Chinese, English abstract]

Yang Chunhe. (2008). Modern logistics industry cluster formation and evolution model research. Beijing jiaotong university, docter degree thesis. [in Chinese]

Yoon, K. (1987). A reconciliation among discrete compromise situations. Journal of the Operational Research Society. 38 (3): 277–286. doi:10.1057/jors.1987.44.

Zhang Dongxia, Miao xin, Liu Liping et al. (2015). Smart grid big data technology development research. China eletrical engineering, (01) , 2-12. [in Chinese]

Zhang Lele & Feng Ailan. (2005). Comparative analysis on modern logistics and traditional logistics. Logistics technology, (7), 23-25. [in Chinese, English abstract]

Zhang Jie, Tang Hong, Su Kai et al. (2009). The effectiveness evaluation method study, 48-64. [in Chinese]

Zhang Weimin. (2004). Model of urban sustainable development evaluation based on entropy value method. Journal of xiamen university philosophy and social science edition, 109-114. [in Chinese, English abstract]

Zhao Guanghui. (2016). The evolution of our country "Internet+" transportation service and policy. China's circulation economy, (3) : 39-48. [in Chinese, English abstract]

Zhao Xuhui. (2008). The comparison of Chinese agricultural products logistics models. Economic Tribune, (6), 61-62. [in Chinese]

Zhang Ming & Zhou Peng. (2006). Comparative analysis of the third party logistics and proprietary logistics. Coastal enterprises and science & technology, (2), 20-21. [in Chinese]

Zheng Qinghua & Zhang Zhiguang. (2011). Forestry research present situation and the trend of logistics management. Journal of Nanjing forestry university, humanities and social sciences edition (02) : 52-57. [in Chinese]

Zou Dan & Chen Zhigao. (2001). Logistics models analysis and choice in e-commerce enterprises. China Busienss & Market, 2 (4-6). [in Chinese]

Zou, Zh., Yun, Y., & Sun, J. (2006). Entropy method for determination of weight of evaluating indicators in fuzzy synthetic evaluation for water quality assessment. Journal of emvironmental science 18(5), 1020-1023.

APPENDIX 1. THE INDEXING SYSTEM OF THE STUDY

All 3rd level indexes are positive

（1） 1st Level Index	（2） 2nd Level Index	（3） Third Level Index
A Logistics Model & Brand	A_1 Model	A_{11} Self Run=1；Logistics Alliance=2；3rd party=3
	A_2 Brand	A_{21} SF Express =1；EMS =2；Shentong Express =3； YT Express =4； ZT Express =5；Other brands=6
B Services	B_1 Quality	B_{11} Comparison with Similar Stores
	B_2 Package	B_{21} Material
		B_{22} Special protection
		B_{23} Sample
		B_{24} Special package to keep fresh
		B_{25} Specific recognition
		B_{26} Solid
	B_3 Tracking Status System	B_{31} Reminder when goods sent, duration and arrival=1； Shipping routs tracking =2；Courier open and check when delivery=3
	B_4Customer Services	B_{41} General rate
		B_{42} Exclusive customer service
		B_{43} 3rd party information (sms message or email)
		B_{44}Real-time online chat
		B_{45} Modify customer info and shipping address online
C Promotion	C_1 Special Discount	C_{11} When reach required amount
		C_{12} Seasonal discount
		C_{13}Membership bonus
	C_2Pushing Information	C_{21} By email
		C_{22} By message
		C_{23} By tmall app
D Payment Methods	D_1Payment Pathway	D_{11}Credit card =1；Debit card =2；Ali pay =3；others=4
	D_2 Payment Type	D_{21} Pay on Delivery
		D_{22} Installment
		D_{23} Pay by Others
		D_{24} Gift Card & Coupon
E Delivery	E_1 Original Port	E_{11} Single Port=1, Multiple Port=2
	E_2 Delivery Timeliness	E_{21} Normal delivery (Within 24 hours)= 3；Within 48 hours= 2；Longer =1
		E_{22} Flash delivery
		E_{23} Delivery on promise time system
		E_{24} Late delivery insurance
		E_{25} Delivery point warehouse
	E_3 Basic Elements	E_{31}Shipping Price （Free Shipping =1, Self Payment =0）
	E_4 Extra Elements	E_{44} Delivery Insurance
		E_{42} Provide Invoices
F Information and Technology	F_1 Technology Using	F_{11}Bar Code
		F_{12} QR Code
		F_{13} EDI
		F_{14} GPS
G Reputation & Feedback System	G1 Feedback System	G_{11} Online =1;Offline=2；both=3
	G2 Complaining Chanel	G_{21} Online =1;Offline=2；both=3
H General Information of Stores	H_1Type of Store	H_{11}Mushrooms
		H_{12} Nuts
		H_{13} Dry Fruits
		H_{14} Fruits
		H_{15} Flower and Plant
		H_{16} Herb
	H_2 Company Location	H_{21}East China
		H_{22}South China
		H_{23}West China
		H_{24}North China
		H_{25}Middle China
		H_{26} Multiple Places
	H_3 E-shop Scale	H_{31} Small（1-30）=1；Medium-sized（31-60）=2；Large（60 and more）=3
	H_4 E-shop experience	H_{41} More than 10 years
		H_{42} 5-10 years
		H_{43} Less than 5 years
	H_5 Customers amount （unit：10,000）	H_{51} Small（0-2）=1；Medium-sized（2.01-4）=2；Large（More than 4）=3
	H_6 General Platform	H_{61} High（higher than 4.80）=3；Medium（4.50-4.80）=2；Low（lower than 4.50）=1

APPENDIX 2. ORIGINAL DATA

（1）	（2）	（3）	（4）	(5)	…	（252）	（253）	(254)	…	(362)	(363)	(364)	(365)
	S1	S2	S3	S4	…	S251	S252	S253	…	S361	S362	S363	S364
A11	3	2	3	2	…	3	3	3	…	3	3	3	3
A12	7	7	1	7	…	2	2	2	…	7	7	2	2
B11	24.76	25.68	43.48	11.47	…	18.89	7.18	44.94	…	-6.38	-4.36	-5.18	-3.9
B21	3	3	4	3	…	2	2	2	…	2	2	2	2
B22	0	0	0	0	…	0	1	0	…	1	0	0	0
B23	2	2	0	0	…	2	2	2	…	1	1	1	1
B24	2	0	0	0	…	1	1	1	…	1	1	1	1
B25	1	2	2	2	…	1	1	1	…	1	1	1	1
B26	1	1	1	2	…	1	1	1	…	1	1	1	1
B31	1	1	0	1	…	0	0	0	…	0	0	0	0
C11	4.8	4.8	4.8	4.6	…	4.8	4.8	4.8	…	4.4	4.5	4.5	4.6
C12	1	1	1	1	…	1	1	1	…	1	1	1	1
C13	1	1	1	1	…	0	1	0	…	0	1	1	1
C21	1	1	1	1	…	1	1	1	…	1	1	1	1
C22	1	1	1	1	…	0	0	0	…	0	0	0	0
C23	1	1	1	1	…	1	1	1	…	1	1	1	1
D11	1	1	1	1	…	1	1	1	…	0	0	0	0
D21	0	0	1	1	…	0	0	1	…	1	0	0	0
D22	0	0	0	1	…	0	0	0	…	1	1	1	1
D23	1	1	1	0	…	0	1	0	…	0	0	0	0
D24	1	1	1	0	…	1	1	0	…	1	1	1	1
E11	1	1	1	1	…	1	1	1	…	0	1	0	1
E21	1	1	1	1	…	1	1	1	…	0	1	0	1
E22	1	1	1	1	…	1	1	1	…	0	0	0	0
E23	0	0	0	1	…	0	0	0	…	0	0	0	0
E24	0	0	0	1	…	0	0	0	…	0	0	0	0
E25	2	1	2	1	…	2	2	2	…	2	2	2	2
E31	1	1	3	1	…	2	2	2	…	1	1	1	1
E41	1	1	0	0	…	1	1	1	…	1	1	1	1
E42	1	1	0	1	…	1	1	1	…	1	1	1	1
F11	0	1	0	0	…	1	1	0	…	0	0	0	0
F12	0	0	0	0	…	1	1	1	…	0	0	0	0
F13	1	0	1	0	…	1	1	0	…	0	0	0	0
F14	0	0	1	0	…	1	1	1	…	1	0	0	0
G11	0	0	1	1	…	1	0	0	…	1	1	1	1
G21	0	0	1	0	…	0	0	0	…	0	1	0	0

APPENDIX 3. STANDARDIZED DATA OF 364 NTFPS STORE FROM TMALL

Index	S1	S2	S3	S4	…	S251	S252	S253	…	S361	S362	S363	S364	Max.value	Min.value
A_{11}	1.000	0.500	1.000	0.500	…	1.000	1.000	1.000	…	1.000	1.000	1.000	1.000	1.000	0.000
A_{21}	1.000	1.000	0.000	1.000	…	0.167	0.167	0.167	…	1.000	1.000	0.167	0.167	1.000	0.000
B_{11}	0.324	0.332	0.492	0.204	…	0.271	0.166	0.505	…	0.044	0.062	0.054	0.066	1.000	0.000
B_{21}	0.667	0.667	1.000	0.667	…	0.333	0.333	0.333	…	0.333	0.333	0.333	0.333	1.000	0.000
B_{22}	0.000	0.000	0.000	0.000	…	0.000	1.000	0.000	…	1.000	0.000	0.000	0.000	1.000	0.000
B_{23}	1.000	1.000	0.000	0.000	…	1.000	1.000	1.000	…	0.500	0.500	0.500	0.500	1.000	0.000
B_{24}	1.000	0.000	0.000	0.000	…	0.500	0.500	0.500	…	0.500	0.500	0.500	0.500	1.000	0.000
B_{25}	0.000	0.500	0.500	0.500	…	0.000	0.000	0.000	…	0.000	0.000	0.000	0.000	1.000	0.000
B_{26}	0.500	0.500	0.500	1.000	…	0.500	0.500	0.500	…	0.500	0.500	0.500	0.500	1.000	0.000
B_{31}	1.000	1.000	0.000	1.000	…	0.000	0.000	0.000	…	0.000	0.000	0.000	0.000	1.000	0.000
B_{41}	0.960	0.960	0.960	0.920	…	0.960	0.960	0.960	…	0.880	0.900	0.900	0.920	1.000	0.000
B_{42}	1.000	1.000	1.000	1.000	…	1.000	1.000	1.000	…	1.000	1.000	1.000	1.000	1.000	0.000
B_{43}	1.000	1.000	1.000	1.000	…	0.000	1.000	0.000	…	0.000	1.000	1.000	1.000	1.000	0.000
B_{44}	1.000	1.000	1.000	1.000	…	1.000	1.000	1.000	…	1.000	1.000	1.000	1.000	1.000	0.000
B_{45}	1.000	1.000	1.000	1.000	…	0.000	0.000	0.000	…	0.000	0.000	0.000	0.000	1.000	0.000
C_{11}	1.000	1.000	1.000	1.000	…	1.000	1.000	1.000	…	1.000	1.000	1.000	1.000	1.000	0.000
C_{12}	1.000	1.000	1.000	1.000	…	1.000	1.000	1.000	…	0.000	0.000	0.000	0.000	1.000	0.000
C_{13}	0.000	0.000	1.000	1.000	…	0.000	0.000	1.000	…	1.000	0.000	0.000	0.000	1.000	0.000
C_{21}	0.000	0.000	0.000	1.000	…	0.000	0.000	0.000	…	1.000	1.000	1.000	1.000	1.000	0.000
C_{22}	1.000	1.000	1.000	0.000	…	0.000	1.000	0.000	…	0.000	0.000	0.000	0.000	1.000	0.000
C_{23}	1.000	1.000	1.000	0.000	…	1.000	1.000	0.000	…	1.000	1.000	1.000	1.000	1.000	0.000
D_{11}	1.000	1.000	1.000	1.000	…	1.000	1.000	1.000	…	0.000	1.000	0.000	1.000	1.000	0.000
D_{21}	1.000	1.000	1.000	1.000	…	1.000	1.000	1.000	…	0.000	1.000	0.000	1.000	1.000	0.000
D_{22}	1.000	1.000	1.000	1.000	…	1.000	1.000	1.000	…	0.000	0.000	0.000	0.000	1.000	0.000
D_{23}	0.000	0.000	0.000	1.000	…	0.000	0.000	0.000	…	0.000	0.000	0.000	0.000	1.000	0.000
D_{24}	0.000	0.000	0.000	1.000	…	0.000	0.000	0.000	…	0.000	0.000	0.000	0.000	1.000	0.000
E_{11}	1.000	0.000	1.000	0.000	…	1.000	1.000	1.000	…	1.000	1.000	1.000	1.000	1.000	0.000
E_{21}	0.000	0.000	1.000	0.000	…	0.500	0.500	0.500	…	0.000	0.000	0.000	0.000	1.000	0.000
E_{22}	1.000	1.000	0.000	0.000	…	1.000	1.000	1.000	…	1.000	1.000	1.000	1.000	1.000	0.000
E_{23}	1.000	1.000	0.000	1.000	…	1.000	1.000	1.000	…	1.000	1.000	1.000	1.000	1.000	0.000
E_{24}	0.000	1.000	0.000	0.000	…	1.000	1.000	0.000	…	0.000	0.000	0.000	0.000	1.000	0.000
E_{25}	0.000	0.000	0.000	0.000	…	1.000	1.000	1.000	…	0.000	0.000	0.000	0.000	1.000	0.000
E_{31}	1.000	0.000	1.000	0.000	…	1.000	1.000	0.000	…	0.000	0.000	0.000	0.000	1.000	0.000
E_{41}	0.000	0.000	1.000	0.000	…	1.000	1.000	1.000	…	1.000	0.000	0.000	0.000	1.000	0.000
E_{42}	0.000	0.000	1.000	1.000	…	1.000	0.000	0.000	…	1.000	1.000	1.000	1.000	1.000	0.000
F_{11}	0.000	0.000	1.000	0.000	…	0.000	0.000	0.000	…	0.000	1.000	0.000	0.000	1.000	0.000
F_{12}	0.000	0.000	1.000	1.000	…	1.000	1.000	1.000	…	0.000	0.000	0.000	0.000	1.000	0.000
F_{13}	1.000	1.000	1.000	1.000	…	0.000	0.000	1.000	…	1.000	1.000	1.000	1.000	1.000	0.000
F_{14}	0.000	1.000	1.000	1.000	…	1.000	1.000	0.000	…	0.000	0.000	0.000	0.000	1.000	0.000
G_{11}	0.000	0.000	0.000	0.000	…	0.000	0.000	0.000	…	0.000	0.000	0.000	0.000	1.000	0.000
G_{21}	0.000	0.000	0.000	0.000	…	0.500	0.000	0.000	…	0.000	0.000	0.000	0.000	1.000	0.000

APPENDIX 4. WEIGHING OF INDEX FOR TMALL NTFPS STORES UNDER INTERNET + LOGISTICS

Index	S1	S2	S3	S4	…	S251	S252	S253	…	S361	S362	S363	S364
A_{11}	0.044	0.022	0.044	0.022	…	0.044	0.044	0.044	…	0.044	0.044	0.044	0.044
A_{21}	0.036	0.036	0.000	0.036	…	0.006	0.006	0.006	…	0.036	0.036	0.006	0.006
B_{11}	0.016	0.016	0.024	0.010	…	0.013	0.008	0.025	…	0.002	0.003	0.003	0.003
B_{21}	0.025	0.025	0.037	0.025	…	0.012	0.012	0.012	…	0.012	0.012	0.012	0.012
B_{22}	0.000	0.000	0.000	0.000	…	0.000	0.014	0.000	…	0.014	0.000	0.000	0.000
B_{23}	0.029	0.029	0.000	0.000	…	0.029	0.029	0.029	…	0.015	0.015	0.015	0.015
B_{24}	0.039	0.000	0.000	0.000	…	0.020	0.020	0.020	…	0.020	0.020	0.020	0.020
B_{25}	0.000	0.001	0.001	0.001	…	0.000	0.000	0.000	…	0.000	0.000	0.000	0.000
B_{26}	0.022	0.022	0.022	0.043	…	0.022	0.022	0.022	…	0.022	0.022	0.022	0.022
B_{31}	0.011	0.011	0.000	0.011	…	0.000	0.000	0.000	…	0.000	0.000	0.000	0.000
B_{41}	0.042	0.042	0.042	0.040	…	0.042	0.042	0.042	…	0.038	0.039	0.039	0.040
B_{42}	0.033	0.033	0.033	0.033	…	0.033	0.033	0.033	…	0.033	0.033	0.033	0.033
B_{43}	0.018	0.018	0.018	0.018	…	0.000	0.018	0.000	…	0.000	0.018	0.018	0.018
B_{44}	0.040	0.040	0.040	0.040	…	0.040	0.040	0.040	…	0.040	0.040	0.040	0.040
B_{45}	0.022	0.022	0.022	0.022	…	0.000	0.000	0.000	…	0.000	0.000	0.000	0.000
C_{11}	0.036	0.036	0.036	0.036	…	0.036	0.036	0.036	…	0.036	0.036	0.036	0.036
C_{12}	0.033	0.033	0.033	0.033	…	0.033	0.033	0.033	…	0.000	0.000	0.000	0.000
C_{13}	0.000	0.000	0.029	0.029	…	0.000	0.000	0.029	…	0.029	0.000	0.000	0.000
C_{21}	0.000	0.000	0.000	0.019	…	0.000	0.000	0.000	…	0.019	0.019	0.019	0.019
C_{22}	0.024	0.024	0.024	0.000	…	0.000	0.024	0.000	…	0.000	0.000	0.000	0.000
C_{23}	0.021	0.021	0.021	0.000	…	0.021	0.021	0.000	…	0.021	0.021	0.021	0.021
D_{11}	0.036	0.036	0.036	0.036	…	0.036	0.036	0.036	…	0.000	0.036	0.000	0.036
D_{21}	0.031	0.031	0.031	0.031	…	0.031	0.031	0.031	…	0.000	0.031	0.000	0.031
D_{22}	0.039	0.039	0.039	0.039	…	0.039	0.039	0.039	…	0.000	0.000	0.000	0.000
D_{23}	0.000	0.000	0.000	0.012	…	0.000	0.000	0.000	…	0.000	0.000	0.000	0.000
D_{24}	0.000	0.000	0.000	0.012	…	0.000	0.000	0.000	…	0.000	0.000	0.000	0.000
E_{11}	0.023	0.000	0.023	0.000	…	0.023	0.023	0.023	…	0.023	0.023	0.023	0.023
E_{21}	0.000	0.000	0.016	0.000	…	0.008	0.008	0.008	…	0.000	0.000	0.000	0.000
E_{22}	0.028	0.028	0.000	0.000	…	0.028	0.028	0.028	…	0.028	0.028	0.028	0.028
E_{23}	0.026	0.026	0.000	0.026	…	0.026	0.026	0.026	…	0.026	0.026	0.026	0.026
E_{24}	0.000	0.015	0.000	0.000	…	0.015	0.015	0.000	…	0.000	0.000	0.000	0.000
E_{25}	0.000	0.000	0.000	0.000	…	0.022	0.022	0.022	…	0.000	0.000	0.000	0.000
E_{31}	0.018	0.000	0.018	0.000	…	0.018	0.018	0.000	…	0.000	0.000	0.000	0.000
E_{41}	0.000	0.000	0.010	0.000	…	0.010	0.010	0.010	…	0.010	0.000	0.000	0.000
E_{42}	0.000	0.000	0.021	0.021	…	0.021	0.000	0.000	…	0.021	0.021	0.021	0.021
F_{11}	0.000	0.000	0.006	0.000	…	0.000	0.000	0.000	…	0.000	0.006	0.000	0.000
F_{12}	0.000	0.000	0.012	0.012	…	0.012	0.012	0.012	…	0.000	0.000	0.000	0.000
F_{13}	0.022	0.022	0.022	0.022	…	0.000	0.000	0.022	…	0.022	0.022	0.022	0.022
F_{14}	0.000	0.026	0.026	0.026	…	0.026	0.026	0.000	…	0.000	0.000	0.000	0.000
G_{11}	0.000	0.000	0.000	0.000	…	0.000	0.000	0.000	…	0.000	0.000	0.000	0.000
G_{21}	0.000	0.000	0.000	0.000	…	0.000	0.000	0.000	…	0.000	0.000	0.000	0.000