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Research about the Development Path of “Internet + Logistics” under E-commerce

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Abstract: In the "Internet +" environment, with the emergence of new ideas and new technologies such as mobile Internet, big data, cloud computing etc., the traditional logistics industry begin to integrate deeply with the Internet. Through defining the concepts of "Internet +" and "Internet + logistics", the paper analyze the value connotation of "Internet + logistics" from three aspects as integration of logistics value, reconfiguration value chain and disintermediation function. And then based on seven theories as resource base/dependence, transaction cost, principal-agent, long tail, market equilibrium, consumption sovereignty and value chain, we study on the theoretical connotation of "Internet + logistics". Moreover, the development path of "Internet + logistics" is proposed, which exist three typical modes: platform mode, crowdsourcing mode and cross-border mode.

Keywords: Internet + logistics; value connotation; theoretical connotation; development path

1. INTRODUCTION

"Internet +" is quietly close to our lives, and the future of the Internet will be the same as the water and electricity so that we cannot do without it all the time ^[1]. The logistics industry is related to the national economy and life, in the "Internet +" environment, we need to find a better path to form "Internet + logistics".

In China, with logistics industry developed for about 30 years, the goods delivery volume, turnover and throughput of rail transportation and road transportation are rank the first one in the world, and air cargo and express volume in the second. Logistics industry has become a pillar industry of national economy. However, logistics industry development mode is still in a relatively extensive stage, and isn't fit with the overall level of economic and social development ^[2]. The traditional mode of logistics operation has been difficult to keep developing for next time. With the emergence of mobile Internet, big data, cloud computing, etc. "Internet + logistics" become more available and imaginable.

2. THE IDEA OF "INTERNET + LOGISTICS"

2.1 The proposition of "Internet +"

The earliest proposition of "Internet +" can be traced back to "Internet +" formula proposed by Yu Yang in 2012. "Internet +" formula shows that combining the products and services in the scenarios of cross-network and cross-platform can make a "chemical change" ^[3]. In 2015, Ma huateng proposed "Internet +" as the driving force to promote economic and social innovation development. At the same period, Li Keqiang proposed the "Internet +" action plan in the government work report for the first time, and then "Internet+" become a strategy with national level. Subsequently, many scholars and managers began to research and explore the theory and practice of "Internet +" field.

From the existing research, "Internet +" theory and application is still in its infancy, the various sectors of the "Internet +" is still in the process of argument and discussion. But there is no doubt that "Internet +" is

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gradually infiltrated, expanded and applied to the tertiary industry, such as the formation of the Internet finance, Internet education and other new forms of industry. "Internet +" began to promote such as logistics and other traditional industries transformation and upgrading, which provide a broad space for development.

2.2 The concept of "Internet + logistics"

In the "Internet +" environment, the timeliness of information technology makes the relatively short distance from one point to another point, which led to the strong demand of integration logistics industry resources and logistics operations to enhance the logistics efficiency. The traditional logistics industry is characterized by labor-intensive, mainly by manual work, prefer to logistics hardware facilities and equipment investment. But with the logistics activities driven by the manufacturing industry changing to E-commerce, express and LTL logistics replace part of the traditional contract logistics, and increasingly inclined to small batches, multi-batch, high frequency logistics operations, the traditional mode of logistics operation can not keep up the pace of market demand, homogenization of services, malignant price competition, low level of service, customer complaints and other problems. To resolve those "pain points", "Internet + logistics" is a feasible way.

Therefore, "Internet + logistics" can be described as a new logistics form under the development of mobile Internet and logistics industry, by fully exerting the optimization and integration function of mobile Internet with the allocation of logistics resources, reconstruction of value chain, understanding of customer needs, real-time scheduling of transportation, storage, distribution and other intermediate links, the information and resources is sharing in supply chain upstream and downstream, the process of procurement, transportation, warehousing, distribution is visible, which enhance customer satisfaction experience and the efficiency of logistics services goals.

3. THE VALUE CONNOTATION OF "INTERNET + LOGISTICS"

The core value of the Internet is to make the cooperation in the supply chain more closely through the exchange of information. The value of "Internet + logistics" reflect in the value chain of the Internet real-time, efficient integration of logistics resources, according to market and customer needs. Specifically, the "Internet + logistics" has the following value connotation.

3.1 The connotation of integration logistics resources

One of the most important way of Internet is to integrate resources. According to the theory of resources third law, an important role of the Internet is to enhance the connectivity of the world. In the language of systems economics, the Internet has facilitated systematization. Internet connectivity is unprecedented, therefore, the Internet resource integration is unprecedented^[4].

For the description of this integration, we assume that the set of Internet nodes is v and Xv is the eigenfunction of v , then the integral $\int xv dv = \sum_{v \in V} m(\{v\})$ of xv on V , where $m(\{v\})$ is The measure of the resource intensity of node v . $\int Xv dv = m(v)$ when $m(\{v\})$ is additive; $m(v) \neq \sum_{v \in V} m(\{v\})$ when $m(\{v\})$ is not additive. In the case of complete connectivity, $\int Xv dv = \sum_{v \in V} m(\{v\}) = m(v)$; in the case of complete connectivity, N is the number of Internet nodes. Conclusion: $m(v) \leq \int Xv dv \leq N \cdot m(v)$, the difference $N \cdot m(v) - m(v)$ is the system effect caused by connectivity. In fact, due to the knowledge fusion effect, knowledge fusion leads to knowledge innovation, which leads to higher actual value.

On the one hand, the integration of resources created a new social and economic environment, which forced the traditional logistics organizations to be opening; on the other hand, traditional logistics organizations strengthen the external communication, which provides a convenient, fast, economical way to integrate of external resources.

3.2 The connotation of reconstruction value chain

"Internet + logistics" will inevitably require changes for the traditional logistics mode, and reorganization of

logistics processes. In essence, "Internet + logistics" reconstruct the logistics value chain ^[5].

3.2.1 Surface reconstruction

The surface reconstruction of the logistics value chain is based on the traditional Internet, such as WEB1.0, WEB2.0 technology, with the symbol of the logistics information aggregation and distribution. For example, through the portal site, ERP, logistics information system, APP, etc., the traditional logistics industry was restructured. Accessing of logistics information or dissemination of information by newspaper, periodicals, television, PC, mobile phone or blog, WeChat, the speed of information dissemination is also quite different.

3.2.2 Depth reconstruction

The depth reconstruction of the logistics value chain is based on the mobile Internet, such as WEB3.0 technology, with a symbol of the logistics parts link with each other. In that process, the supply chain is reconstructed. Under depth reconstruction, the original industry will be subversive transformation, the former industry leader will be replaced, which is disruptive innovation theory proposed by Clayton Christensen.

3.3 The connotation of removing intermediary

"Internet + logistics" provide direct driving force to remove intermediate links in the logistics, intermediate costs are disintermediation ^[6]. Firstly, the logistics activities in the process of supply and demand sides through the Internet directly docking, saving time, manpower, material and other transaction costs, which directly benefit the parties to the transaction; Secondly, due to shorten the trading chain and avoid too much human involvement, the transaction process will be clearly recorded on the Internet, and reviewed at any time, which ensure the transparency of the transaction; lastly, "Internet + logistics" led the trading chain changing to direct and efficient feedback a variety of data by the "Internet + logistics" platform, which provide an objective reference to make logistics more efficiently.

4. THE THEORETICAL CONNOTATION OF "INTERNET + LOGISTICS"

From the theoretical origin, "Internet + logistics" has seven theoretical connotations. The integration of logistics resource comes from the resource base / dependence theory, the long tail theory and the market equilibrium theory; the reconstruction of value chain comes from the principal-agent theory; and the disintermediation functions comes from consumption sovereignty and the value chain theory.

4.1 The connotation of resource base / dependence theory

Wernerfelt's (1984) resource-based theory view ^[7] to an enterprise as a combination of production resources, business growth depends on the use of surplus resources. The theory focuses on the analysis of internal resources and capabilities of enterprises. In order to fully exploit the existing resources and capabilities and develop the competitive advantage of enterprises, it needs to supplement the resources and capabilities of the enterprises from outside. The Resource Dependence Theory ^[8], as proposed by Jeffrey Pfeffer and Gerald Salancik (1978), focuses on the external environment of an enterprise and considers that a firm is closely related to other enterprises and organizations in its surroundings. The success and survival of this enterprise To rely on other enterprises and organizations to provide the necessary resources, and to actively manage or control the flow of resources. For logistics activities, the Internet just for internal and external communication provides an efficient channel, the logistics resources in this channel to a reasonable flow and the full deployment of logistics resources to achieve efficient integration.

4.2 The connotation of transaction cost theory

According to Williamson (1985) on the definition of transaction costs theory ^[9], which refers to the cost of a transaction to spend, but also refers to the process of buying and selling all the time and money costs. The transaction costs in the traditional logistics industry, including the cost of collecting logistics service information and transaction object information, obtaining the transaction object information and the information cost needed

for exchanging information with the transaction object, according to the logistics contract, the logistics service price, the logistics bargaining cost of bargaining at the service level, the cost of decision making and signing of the logistics contract, the cost of supervising the logistics service transaction, the ex post transaction cost and the restraining cost to win the trust of the other party. The "Internet + logistics" will remove some of the intermediate links of logistics, logistics services to reduce the transaction costs associated with.

4.3 The connotation of principal-agent theory

Based on asymmetric information game theory^[10], principal-agent theory can not observe the agent's behavior in the case of asymmetric information, and only observes the related variables. These variables By the agent's actions and other exogenous random factors. According to the principal-agent dynamic model of Radner (1981) and Rubbinstein (1979), considering the Internet technology, Internet + logistics makes the logistics service principal and agent maintain a certain relationship. First, , The exogenous uncertainty can be eliminated, the client can be relatively accurately inferred from the observed variables in the level of the agent's efforts, the agent can not be lazy way to improve their own welfare. Second, the long-term part of the contract to the agent to provide a "personal insurance" (self-insurance), logistics services, the principal may be exempt from the agent's risk. That is, "Internet + logistics" can achieve Pareto first-order optimal risk-sharing and incentives^[10].

4.4 The connotation of long tail theory

The Long Tail theory (Chris Anderson, 2004) builds on the notions of power law and Pareto distributions in statistics. Because of the cost and efficiency factors, the cost of logistics services falls sharply in the Internet environment so that individuals can provide it, and when the cost of logistics sales is drastically reduced, almost any seemingly low-demand service can be sold. Sales of logistics services do not lie in the traditional demand curve on behalf of "hot line", "selling project" head, but on behalf of "popular market" is often forgotten long tail^[11]. With the help of the Internet, these demand is not busy or poor sales of logistics services together to occupy the market share and those few hot-selling services to occupy the market share or even larger, that "Internet + logistics" there are many small market convergence Into the mainstream market can produce and match the energy.

4.5 The connotation of market equilibrium theory

According to Walras (1874) the general equilibrium theory, the entire economy is in equilibrium, all consumer goods and factors of production prices will have a certain equilibrium value, their output and supply, will have a certain Balance. "Internet + logistics" provides a "perfect competition" equilibrium conditions, customers can get the maximum effect, logistics activities can get the most profit. At this point, not only the logistics service provider is more likely to achieve economies of scale, the demand for economies of scale to achieve economies of scale so that transaction costs, leading to further reduction of supply side costs and prices, which also strengthen the demand side economies of scale, and thus the formation of supply and demand side Between the virtuous cycle, resulting in positive feedback effect, and further reduce the cost of supply and demand sides to improve efficiency, the formation of a new market equilibrium^[12].

4.6 The connotation of consumer sovereignty theory

According to Friedrich A. Hayek's consumer paramountcy theory, in the Internet environment, consumers according to their own preferences and preferences to purchase the required goods, and through the network platform to convey to the producers, so all producers to listen to the consumer's The views of arrangements for production, providing consumers with the necessary goods. Internet technology allows customers in the logistics service trade negotiations began to exceed the power of enterprises and obtain a dominant position, thus greatly enhancing the customer's role in the logistics business, the formation of consumer sovereignty. "Internet + logistics" under the consumer sovereignty is mainly reflected in the customer's logistics services with pricing power, choice, evaluation of the design of the logistics program has the right to participate, dominance, lead, and ultimately the formation of customer value in the logistics Chain activities in the right to speak^[13].

4.7 The connotation of value chain theory

According to Michael E. Porter's (1985) value chain theory, every value activity on the value chain will have an impact on how much value the firm will ultimately achieve. "Internet + logistics", the logistics value chain can be decomposed and integrated from the analysis of the entire value of the process, give up or add some value-added links, from their own comparative advantage, select a number of links to develop and enhance its core competitiveness, Using the market to seek partners to jointly complete the whole process of the value chain^[14]. The value chain theory reveals that "Internet + logistics" is the competition of the whole value chain. The value in the customer's mind consists of a series of specific activities and profits in material and technology. When competing with other enterprises, Activities in the competition, rather than an activity of competition.

5. THE DEVELOPMENT PATH OF "INTERNET + LOGISTICS"

From the definition of "Internet + logistics", the primary way of "pain point" and "Internet + logistics" based on traditional logistics industry change the original mode of logistics operation, take advantages of mobile Internet, big data and cloud computing^[15]. From the value connotation and theoretical connotation of "Internet + logistics", under the theories of transaction cost theory and market equilibrium theory, "Internet + logistics" forms the logistics platform mode; under the integration logistics resources and principal-agent theory, "Internet + logistics" forms the crowdsourcing mode; under the theory of resource base / dependence theory and value chain theory. "Internet + logistics" forms cross-border mode.

5.1 The development path of platform mode

5.1.1 Supply chain platform mode

"Internet + logistics" mode of the supply chain platform, represented by Yiyatong Supply Chain Co., Ltd. which shifted its focus from the traditional "supply chain management" to the "deep supply chain platform"^[16]. Yiyatong is a centralized procurement and distribution-oriented supply chain management channel, provide customers with one-stop supply chain services, including procurement, logistics, sales, collection of full-service. Compared with the traditional procurement and distribution, Yiyatong is a supply chain management platform, collecting the non-core business outsourcing, providing more professional value-added services and supply chain management services, then the cost rate and consolidated gross margin level. Through the establishment of a quick response mechanism and flexible service product mix, Yiyatong realize the integration of business flow, logistics flow, capital flow and information flow. At the same time, the company provide the best service to all the customers. Combined with JIT operation and management, the formation of Yiyatong's unique one-stop supply chain solutions and service portfolio for enterprises provide professional, comprehensive supply chain services.

5.1.2 Logistics information platform mode

"Internet + logistics" mode of logistics information platform, represented by Cainiao network CO., Ltd.. Based on China's intelligent logistics backbone network project, Cainiao use cloud computing, network finance and other new technologies for all types of B2B, B2C and C2C to provide an open logistics service platform. Cainiao use the Internet technology established an open, transparent, shared data application platform for e-commerce enterprises, logistics companies, warehousing companies, third-party logistics service providers, supply chain service providers and other types of services, which support the logistics industry to high value-added areas of development and upgrading, and the purpose is to promote the usefulness of social resources and make an efficient coordination mechanism to enhance the quality of social logistics services.

5.1.3 Road transport platform mode

"Internet + logistics" mode of transport platform, represented by Kaxing CO., Ltd. Kaxing is essentially a transport platform. The platform does not earn the difference between the two sides of the transaction altruism to

promote the transaction. The card platform of the world's largest platform strategy to members of each other transactions, quality of service records and credit and financial support as the main component of the concentration of green members, franchise outlets, third-party logistics companies, Internet trading customers, built on the built-in service network platform. Card line the world through the line and online two networks, the establishment of circulation under the line network, the establishment of standardized platform for online mode, butt all kinds of third-party enterprises to meet the needs of all parties to the service.

5.2 The development path of crowdsourcing mode

"Internet + logistics" mode of crowdsourcing, represented by Kuaiditu CO., Ltd. Kuaiditu's distribution process is used in the way of social crowdsourcing, the express capacity through the mobilization of social idle resources have been greatly improved. Delivery courier is an ordinary social workers, through its strict examination and standardization of training, the use of central scheduling mode, the nearest distribution staff received the task and complete the pickup in one hour. From the integration of bulk mail delivery needs, packaged to the major courier companies, the equivalent of a large single-handedly holding a large customer. In addition to individual users, Kuaiditu users also include nearly a thousand small and medium enterprises, to integrate the company's internal parts. Kuaiditu reduce or even replace the express line of the company's outlets, directly to the logistics company terminus, thereby enhancing the logistics efficiency.

5.3 The development path of cross-border mode

5.3.1 Functional cross-border mode

"Internet + logistics" mode of functional cross-border, represented by Debang Logistics CO., Ltd. and SF express CO.,Ltd.. Debang provide domestic road LTL and air transportation agency services. In 2013, Debang began to develop express business, from the transport sector into the field of cross-border distribution. The express and transport is similar to two very high segment logistics functions, have network characteristics, to provide standardized services, with replicability. Service standardization results can be batch, fast copy, therefore, through the clear positioning, Debang successful cross border into the express industry. In 2014, SF set up road transport fleet, launched a one-stop "door-to-door" of the land logistics products, and face competition to Debang and other domestic road transport logistics enterprises. SF cross border from the field of distribution into the transport sector to meet customer needs and the occupation of the market. As a strategic level, SF is more self-reliance to enter logistics market and lead the market.

5.3.2 Industry integration mode

"Internet + logistics" mode of industry integration, represented by SF and Jingdong. In 2012, SF began to develop E-commerce "SF Selection", relying on the SF Express nationwide distribution network, from the origin to the whole process of residential cold chain preservation, located in the high-end food B2C. "SF" is the essence of express logistics industry in the integration of E-commerce industry. In contrast, Jingdong enter into its continuous occupation of the market, relying on the distributin centers as the hub of the logistics system, and apply for express licenses, E-commerce and logistics industry, to achieve mutual promotion and depth of integration.

5.3.3 Industry linkage mode

"Internet + logistics" mode of industry linkage, represented by Ririshun logistics CO., Ltd.. In 2013, Haier Electric Co., Ltd. and Ririshun jointly established the end - to - end large - scale logistics service standards, to develop and provide innovative supply chain management solutions. Ririshun mode promotes the cooperation and linkage between home appliance manufacturing industry and logistics service industry.

5.3.4 Industry cross-border mode

"Internet + logistics" mode of industry cross-border, represented by Chuanhua logistics CO., Ltd.. Chuanhua established a logistics platform called "highway port", has been completed the highway port logistics park in Zhejiang, Suzhou, Chengdu and Fuyang. From the macroscopic point of view, the logistics operation is a

complex network system, in which the node is the distribution center. Therefore, the essence of Chuanhua logistics is cross-border to the real estate industry.

6. CONCLUSIONS

In the "Internet +" environment, the logistics industry and the Internet will be fused with each other. "Internet + logistics" is not only the transformation and upgrading of traditional logistics industry, but also the long-term vision and strategic considerations for traditional logistics enterprises. "Internet + logistics" has the value connotation and theoretical connotation, which make a change of the logistics development path. The logistics operation mode will be three directions: platform mode, crowdsourcing mode and cross-border model. With "Internet +" concept development continuous, the "Internet + Logistics" will take full advantage to create a new logistics industry ecology.

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