

Research on Logistics Management Information System of Smart Port under internet plus Mode

Cong Liu^{1,a}, Haohan Zhang^{1,b*}

Email: 349534996@qq.com^a, *Email: 540882687@qq.com^b

Liaoning Technical University, Liaoning, China¹

Abstract: The development mode of "internet plus" has greatly promoted the development of modern information technology, and gradually penetrated into all fields of port shipping industry. With the continuous development and progress of information technology, the effective application of information technology in port logistics system can ensure the optimization and progress of logistics management level on the basis of improving the integrity and application efficiency of operation process, and truly construct a more complete management system. This paper briefly analyzes the application value of information technology in port logistics management, and discusses the problems existing in the application process and the countermeasures.

Keywords: Information technology; Port logistics management; Application; Problems; Internet plus

1 INTRODUCTION

With the rapid development of network technology and information technology, a brand-new concept "Internet plus" [7] permeates all levels of modern social and economic development. "internet plus" takes the Internet as a platform, and combines the Internet with traditional industries by means of modern technology to realize the system aggregation effect of "1+1>2". The traditional logistics industry lacks flexibility and expansibility when dealing with information between enterprise nodes, which leads to low efficiency. However, combining with the "internet plus" model, information can be better shared, which is bound to be a new development trend of the logistics industry in the future.

2 OVERVIEW OF LOGISTICS MANAGEMENT UNDER "INTERNET PLUS" AND "NEW RETAIL"

Logistics management under the background of "internet plus" is a brand-new concept. It is efficient and convenient to optimize the production and sales management of enterprises and further optimize the whole logistics channel to form dynamic management with the help of Internet platform. In October 2016, Ma Yun put forward the new retail for the first time at the Ali Yunqi Conference. "In the next ten or twenty years, there will be no e-commerce, only new retail." New retail refers to the combination of online, offline and logistics. Therefore, the formation of a new retail model must rely on a powerful logistics system, and combine new

technologies such as big data, Internet of Things, cloud computing and artificial intelligence to optimize the management of major functions in logistics. shown in Figure 1.

RRTS' Comprehensive Service Offering is Unique

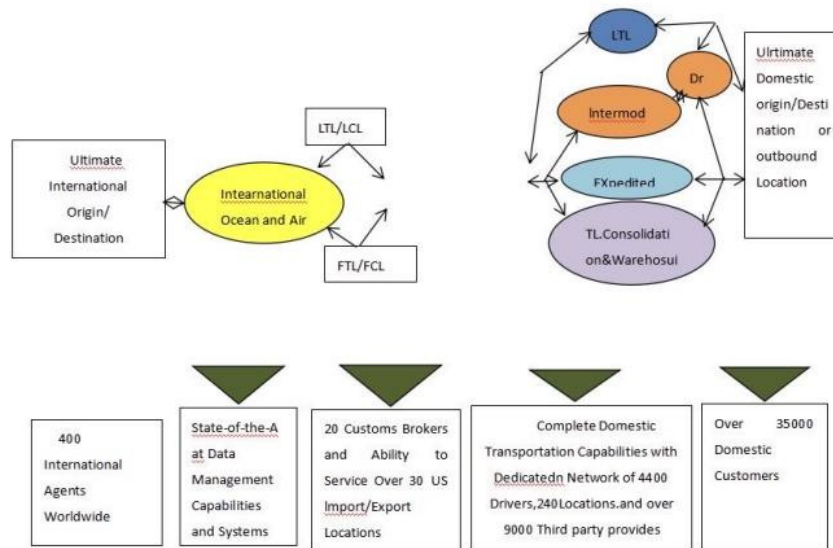


Figure 1 "internet plus" logistics platform

(A) optimize inventory management

Improving inventory management can better control the balance between inventory and service, and ensure the minimum inventory on the basis of maximum customer satisfaction. The optimization of inventory management can make logistics activities smoother and more efficient, and it is also a key factor for the innovation and development of logistics management. shown in Table 1.

Table 1 Supplier Data Sheet Design

Field name	meaning	data type	Can it be empty?	explain
Supplier ID	Supplier number	Char(4)	principal linkage	The supplier number is 4 digits.
Supplier Name	Supplier name	Nvarchar(50)	NO	
address	address	Nvarchar(50)	YES	
telephone	telephone	Nvarchar(50)	YES	
fax	facsimile	Nvarchar(50)	YES	
credibility	Credit rating	Char(2)	YES	Values are: excellent, good and poor.
Commodity Supply	Provide goods	Text(16)	YES	

(B) Optimize warehousing management

Warehouse center is an important part of logistics management. Combining FRID technology and artificial intelligence to build an intelligent three-dimensional warehouse and realize logistics management innovation, At the same time, we should pay attention to the quality management of the warehouse center, rationally plan the warehouse location and strengthen the quality supervision of goods. shown in Table 1.

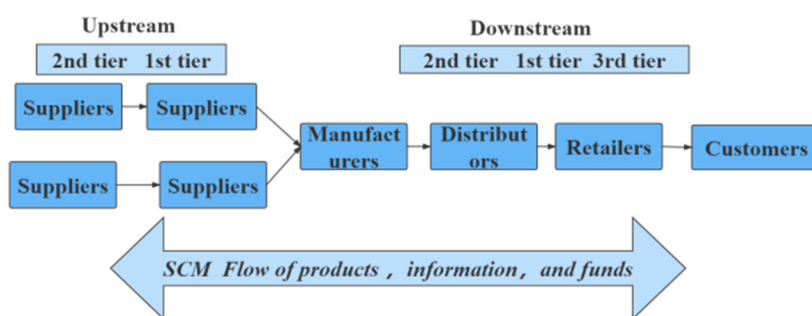


Figure 2 e-commerce supply chain framework

The data collected by artificial intelligence terminal and log data form a corresponding relationship, so that the progress and time of port cargo transport information real-time dynamic, convenient for management departments to grasp the real-time cargo transport dynamic. For details, see the port transport supply chain information log table., as shown in Table 2.

Table 2 Port Transportation Supply Chain Information Log Table

Data name	field name	data type	Is it empty?	Primary key or not
Name of owner	Name	Int (10)	YES	YES
Arrival time	Arrival time	Int (10)	NO	NO
Departure time	Departure time	Int (10)	YES	NO
Types of goods transported	Type of goods	Varchar(20)	NO	YES
Transportation duration	Type of goods	Varchar(20)	NO	YES
point of departure	Starting point	Int (10)	YES	NO
Terminal location	End point	Varchar(20)	NO	YES

(C) Optimize transportation management

Transportation is an important link in logistics. Optimizing transportation paths, shortening transportation time and ensuring the quality of goods are the key points in logistics transportation management, especially now cold chain logistics is the key to transportation

management innovation. Therefore, it is necessary to strengthen the management of transportation channels, transportation budget, route selection planning, and arrival time of goods.

Second, the characteristics of modern logistics under the "internet plus"

On July 4th, 2015, after the State Council issued "the State Council's Guiding Opinions on Actively Promoting internet plus Action", the model of "internet plus" combined various traditional industries and created a new development ecology. The mode of "internet plus Logistics" has brought greater profits to the logistics industry. Under the influence of the "Internet plus" model, the retail industry has seriously impacted the traditional retail industry, and e-commerce has caused rapid changes in the whole logistics industry. In 2011, the scale of e-commerce transactions in China was about 6 trillion yuan, and in 2017, the scale of e-commerce market in China exceeded 17.5 trillion yuan, an increase of 22.1%. The data growth of e-commerce has also caused changes in modern logistics management, which has the characteristics of multi-function, science and technology, information sharing and spatial layout tending to network.

(D) Multifunctional logistics system

Traditional logistics mainly completes the spatial movement of goods, thus solving the difference between product consumption and production, such as warehousing, processing, transportation, packaging, etc., and then realizing product value. Under the background of "new retail", "new logistics" is not only the integration of logistics, e-commerce and manufacturing, but also the expansion of warehouse automation, transportation rationalization, packaging standardization, intelligent loading and unloading, processing integration, information management networking and so on. With the proposal of "new logistics", the mode of logistics has also changed from traditional decentralized extensive management to intensive management. On the basis of the previous eight functions, the new technology is further subdivided and extended to other links such as picking, preservation, packaging, grading and distribution to enhance the value of logistics functions. Therefore, modern logistics management is more multifunctional and its functions are more powerful, which promotes the rapid development of logistics management. shown in Figure 3.



Figure 3 Vector Logistics Information Map

3 THE LOGISTICS SYSTEM OF SCIENCE AND TECHNOLOGY

In the environment of "internet plus", logistics management presents the characteristics of science and technology. To develop modern logistics, we must rely on various technologies. These technologies can be divided into three levels: perception layer, network layer and application layer. The technology of perception layer includes sensor technology, GPS technology, two-dimensional code technology, sensor technology, etc. The technologies of network layer include wired network, wireless network and mobile data communication (4G). Application layer technologies include M2M technology, cloud computing technology, artificial intelligence technology, UAV technology and big data technology. In addition, the leading technological structures such as 5G, artificial intelligence open platform, ET brain and Big Dipper navigation system in the World Internet Conference held on December 3, 2017 can be applied to the management of modern logistics. All these reflect the science and technology in logistics management under "Internet plus".

Third, the "internet plus" environment of logistics management problems

(A) Information sharing among logistics enterprise nodes needs to be strengthened.

At present, there are few information blockages in the nodes of enterprises in the supply chain, which basically ensure the information sharing between upstream and downstream enterprises. However, the new retail model of the future will bring a frequent flow of logistics information and complex structure. Therefore, the operation of logistics must be based on accurate information, and the logistics, capital flow and operation flow must be planned around information. In the context of "Internet+", new requirements are put forward for the traditional supply chain, which tends to be networked, integrated and scaled up.

(B) Government and policy support needs to be strengthened.

Although in July 2015, the State Council issued "the State Council's Guiding Opinions on Actively Promoting internet plus Action" and put forward relevant guiding opinions on "internet plus", there is still a lack of reasonable management system and legal provisions for internet plus logistics model, so it is easy to cause market confusion. If there is no scientific, reasonable and effective management and restraint mechanism in the logistics market, it will inevitably breed unhealthy competition. The development of new logistics needs the support of advanced technology and equipment, so it is inseparable from relevant industrial policies and preferential investment policies.

4 KEY TECHNOLOGY OF INTELLIGENT PORT LOGISTICS MANAGEMENT INFORMATION SYSTEM

(A) Programming language and development environment

The system mainly uses Java, VB.NET, C++ and so on, A combination of Java language and SSH framework is used in the idea environment, and C + + is used in ASP.NET to complete the coding work of the system..

(B) database system

The system uses the SQL Server 2019 database system and the ASP technology. Add a data warehouse. The data in the data warehouse were analyzed using the Analysis Manager tool of SQL Server 2019.

(C) Software development architecture

The system uses SSH architecture and combines JSP, DAO components and other technologies to form a complete software development mode. The Internet-based technology platform J2EE and MVC architecture Model2 mode simplify JSP functionality. Using Servlet as a controller is responsible for all business logic, using J2EE and Spring-based MVC modes, with strong functionality and high scalability.

(D) System architecture

The system uses the B / S structure [10]. Suitable for wide area network, can better meet customer and market needs, and more interactive, by setting permission can achieve multi-user access control. More importantly, the B / S architecture three-layer architecture is a generally reasonable software structure for object-oriented ideas. Logically, this mode divides the application functions into, customer display layer and business logic layer. The B / S architecture works is shown in Figure 4.

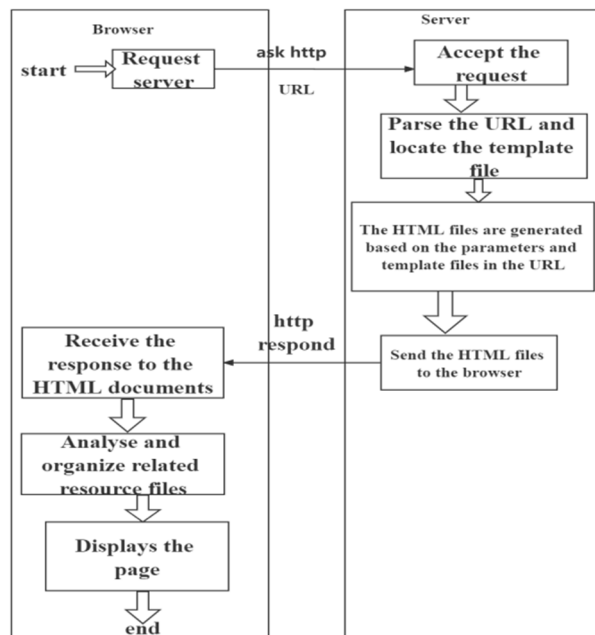


Figure 4. The B / S architecture works

5 CONSTRUCTION OF DISTRIBUTION MODE OF PORT LOGISTICS CENTER

In the information management of port logistics center, there is a common misunderstanding that a considerable number of people simply regard the information management of port logistics center as computers, mobile hard disks to save and print files, or send and receive email, QQ or WeChat through the Internet. In fact, these contents are only a part of the distribution contents of the port logistics center. Moreover, this understanding of the distribution of the port logistics center is superficial and does not go deep into the essence of the port logistics distribution. On the surface, the port logistics center distributes goods, but from the actual content, it actually distributes data information. Only by realizing the seamless connection of the port logistics information can we realize zero mistakes in the port logistics distribution and improve the efficiency of the port logistics center^[4]. Based on this misunderstanding, this chapter will combine the core requirements of the logistics distribution mode of the port logistics center at this stage, and put forward a new distribution mode of the port logistics center: on the one hand, the distribution of the port logistics center constructed in this paper is based on Internet technology, and it must be carried out under government laws and regulations and relevant industry standards; On the other hand, combined with the empirical analysis in the third chapter of this paper, the demand of port logistics center for information management is reflected in four aspects. Therefore, the information management model proposed in this paper must be based on Internet technology and can meet the "ten-dimensional" information management demand proposed in the third chapter of this paper (the specific demand is the empirical analysis result in the third chapter). Based on this, after expert consultation with logistics engineers in the same industry, this paper constructs a "three platforms, four dimensions, eleven modules and one card" logistics distribution model of port logistics center based on Internet, in which "three platforms" refer to: logistics waybill management platform, vehicle operation dispatching command platform and logistics information resource sharing platform. "Ten dimensions" refer to the four demand dimensions of port logistics center distribution (the results of empirical research factor analysis in chapter, and "eleven modules" are the concretization of four dimensions and eleven indicators obtained from empirical research in chapter 3.)Respectively: Cheyuan Center traffic cloud module, Tianjin Port Area traffic logistics infrastructure operation information service module, traffic travel information service module, freight market integrity information service module, emergency logistics information service module and order tracking information service module in professional service application, land and sea transportation information transaction service module, port logistics information service module, logistics enterprise production information management service module, freight hub node information service module^[8] and mobile terminal service module. The detailed information management mode of "three platforms, four dimensions, eleven modules and cartoons" port logistics center is shown in Figure 5

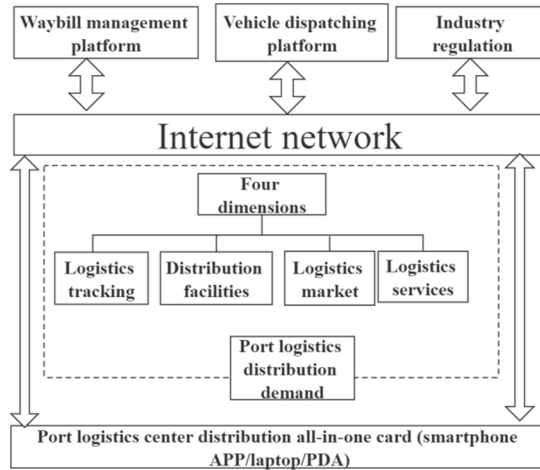


Figure 5. Management mode of port logistics center based on "internet plus"

Fourth, development and innovation in the "internet plus" environment

(A) to speed up the progress and development of logistics technology

With the rapid development of the Internet, the logistics industry is developing towards internationalization, automation, informationization, intelligence and from the inside out. Cloud computing technology can statistically analyze and store big data through the Internet; FRID technology locks the target through radio signals; GPS technology locates moving objects through satellite navigation and positioning technology. In addition, wireless sensor network technology, 4G5G mobile communication technology and artificial intelligence technology are all applied in the logistics industry to help the rapid development of smart logistics.

(B) Strengthen the construction of logistics information platform.

To develop logistics management innovation under the background of "internet plus", we should actively establish information sharing platform for logistics systems, promote information sharing among enterprises, effectively integrate logistics capital flow, information flow and logistics, and build a national or even global trading platform to support the development of new retail.

Logistics information sharing management platform integrates new technologies, management methods and organizational means, which can respond to external emergencies quickly and quickly, thus ensuring the normal and efficient completion of logistics activities. First of all, the information sharing platform provides technical and massive data support for logistics activities. Secondly, it provides comprehensive information such as resource allocation and complementary advantages for logistics services. Finally, it is also a window for logistics enterprises to release information to the outside world.

6 SUMMARY

The era of "internet plus" provided a guarantee for the collection and integration of information resources and promoted the information sharing among enterprises. In the future, the development of new retail can not be separated from smart logistics. Therefore, with the help of the advantages of the Internet, we should adjust the mode and method of logistics management, analyze the existing problems and take corresponding measures to improve the management system^[5]. Using new technology to realize information intelligence, shorten logistics operation time and greatly improve work efficiency. The innovation and development of logistics management will bring us greater economic profits, so it needs to be deeply studied and discussed in combination with technological development. Only in this way can China's logistics industry have a broader prospect.

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