THE RESEARCH ON CHAIN POST LOGISTICS' SUPPLY CHAIN EXECUTION SYSTEM

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ABSTRACT

Supply Chain Execution System (SCES), like the supply chain planning system, is also a key part of supply chain system, Supply Chain Execution System, together with the Supply Chain Planning System; make up the Supply Chain System. Supply Chain Execution System is also an operation plan, control and optimization system in the logistics level in the eye of the whole part of the execution system. The paper explored the China Post Logistics' Supply Chain Execution System systematically on the base of discussing the relevant knowledge of Supply Chain Execution System, and summed up the four characteristics of Chain Post Logistics Supply Chain Execution System. The discussion of China Post Logistics' Supply Chain Execution System has a certain reference not only to China Post Logistics but also to other logistics enterprises' constructions of theirs Supply Chain Execution System.

Keywords: *China Post Logistics, Supply Chain Execution System, Supply Chain Planning System, Enterprise Resource Planning, Customer Relationship Management*

1. INTRODUCTION

Supply Chain Execution system is one of the key part of supply chain system, as similar to supply chain planning system, which contain the planning system, control system, optimization system in the implementation level of supply chain system [1].China Post, as one of which has the largest distribution network logistic enterprise, faced too much pressure from the market, the customers and the competitors in recent years. In nowadays, the logistic service quality required by the market and customers are increasing sharply, and the challenges came from the competitors are getting more and more severe. In this case, only by improving its competitiveness continuously can China Post meet the market and the customers' demand and only in this way can the China Post deal with the challenges from the competitors. Logistic information technology is the modern information technology which used in logistic operation comprehensively. Logistic information technology is the basic mark of modern logistic differs from the traditional logistics, and also is the fastest growing field in logistic technology. Informationization has become the main way to gain competitive advantages as a logistic enterprise [2-4]. Supply Chain Execution System, as one of the most important logistics information

technology, is getting more and more important for a logistic enterprise to gain its competitive advantages.

2. THE SUPPLY CHAIN EXECUTION SYSTEM

All of us know the concept of ERP, but there are little people know the concept of supply chain system, as one of the branches of ERP. The concept of supply chain execution system was first put forward by the foreign countries, but there is still not an accurate definition of this concept so far.

Some ERP software providers aboard have been trying to give a definition of supply chain execution system. Such as Search Manufacturing ERP, this company thinks that supply chain execution system is a system that contains some supply chain activities such as order implementation, procurement, warehousing and delivery [5]. INCOSNO Company thins that supply chain execution system is a management tools which can manage all the logistics operations as a whole and it lies between the warehousing system and the ERP system [6]. The first company which put forward the concept of supply chain execution system first in our country is Beijing Science & Technology Company limited. They think, supply chain execution system is a management system solution aim at provide a set of supply chain or logistics

warehousing, the information input or output in the transportation process or something else [7]. In the academic field, there aren't any paper give a definition of supply chain system, the theoretical research is just beginning.

According to the current understanding of supply chain execution, the author thins that the so- called supply chain system is a logistics information system which based on the management information system; it is not only a business tool system, but also a management system and development system. The roles of this system can be described from the five aspects:

1) To realize the information unobstructed through system operation and make the data flow transmission with logistics nondestructively;

2) The platform was operated by all electronic, it changed the previous instruction manual operation situation, optimized the streamline work process, shortened the processing time, reduced the order processing cost, and improved the transmission efficiency.

3) The supply chain coordination of supply chain management can make all the companies on the chain share the information real-time, and it can help to reduce the overall supply chain inventory level and make the cash flow speeds up, and it can increase the efficiency of the supply chain operation.

4) It can eliminate the error by the disconnected information and it can provide efficient evidence on the payment and settlement;

5) It can maintain good relationship of all the companies on the supply chain, such as the manufacture, supplier, distributors and the retailers, it can help to improve their comprehensive strength and core competitiveness.

3. THE FRAMEWORK OF CHINA POST LOGISTICS SUPPLY CHAIN EXECUTION SYSTEM

Supply chain execution system is a comprehensive, integrated system; it is a system aggregate which contains many small systems, different enterprises construct different supply chain execution system according their own business needs. China post logistics construct its own supply chain execution system according its own business [8-10]. The framework of China Post Logistics Supply Chain Execution System is shown in Figure 1.

China Post Logistics Supply Chain Execution system has 4 levels: the information interaction layer, the service layer, the business service layer, the integration process layer as well as the system layer.

The information interaction layer of China Post Logistics supply chain execution system face the customer and the supplier directly, and it can be divided into 3 sub modules, they are E-commerce platform, CRM platform and customer unified access platform. In these three platforms, different companies are endowed with different privileges, and different users can get through the interface of the system by computer, cell phone and other terminal equipment, and then they can entry into the company's supply chain execution system.
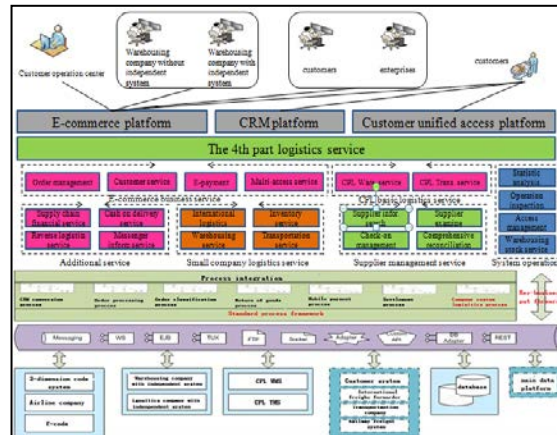

Figure.1 The Structure Of China Post Logistics Supply Chain Execution System

The service layer has 6 sub modules; they are E-commerce business modules, China Post basic Logistics service module, supplier management service module, small company logistics service module, system operation module and additional module.

E-commerce business service module is mainly responsible for China Post Logistics E-commerce business, which includes order management, customer service, E-payment; multi-access service and exchange management (includes website, short messenger and CRM ect.). These 5 jobs are the basic E-Commerce operations, and there is no different with other E-commerce company.

China Post Logistics' basic logistics service module is the main module of China Post Logistics service layer, and it manages the main business of China Post Logistics. China Post Logistics' Supply Chain system contain 2 main sub modules, they are China Post Logistics warehousing sub module and

transportation sub module, and the two modules' structure shown in Figure 2.

Figure.2 The Basic Logistics Service Module Of CPL Supply Chain Execution System

The integration process layer includes 3 parts; there are the supply chain integration, the logistics integration and the financial integration. This integration process include customer relationship management (CRM), order processing management, order classification processing, reverse of good process, mobile payment process, settlement process and company customer logistics process. The integration process management makes China Post Logistics able to establish a standard operating service process; it can provide the customers and the suppliers a full service, it can increase the effectiveness of the China Post Logistics.

The system layer is the background system that the user can not visit directly. This system can be any program, even a corresponding function device. This background system is the key and smooth component of China Post Logistics Supply Chain Execution System, how can this execution system goes depends on it.

The overall framework and modules of China Post Logistics supply chain execution system shown above. This system can be expressed in three ways: information interchange oriented system, service-oriented system and process- oriented system.

2.1 The Architecture Of Service-Oriented Supply Chain Execution System

Constructing the service-oriented application is the first step to build the modern agile supply chain. Since Gartner in 1996 first proposed SOA (Service-Oriented Architecture), it has been very familiar. Generally thinking, SOA is a component model, and the goal is to achieve the interaction between the application systems. It can help to meet the customers' expectation. SOA is a system

architecture model and it is an alternative solution framework for application-oriented services. Among these, S (Web Service) is the basic element and the core of the overall SOA architecture.

The service-oriented architecture of China Post Logistics Supply Chain Execution System can be divided into 5 levels. Respectively, the user interface layer, the business process layer, the service layer, the application connectivity layer, and the back-end system layer. China Post Logistics can achieve agile and flexible supply chain logistics service by these five levels. The specific architecture of this system is shown in Figure 3.
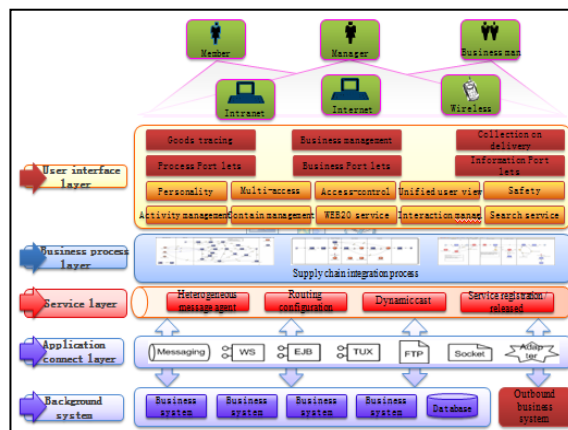

Figure.3 The Architecture Of Service-Oriented Supply Chain Execution System

The user interface layer is the topmost level of the system, it is responsible for goods tracking, business process and collection delivery. China Post Logistics customer, manager and its business men connect to the interface through Intranet, Internet and Wireless, and in this way the exchange the information. China Post Logistics service-oriented supply chain execution system is responsible for the specific job, such as goods management, content management, WEB2.0 services, interactive management and search management. Respectively, it has some characters of personalized, multi-channel access control, the same user rights as well as security features. These features ensure the smooth running of the China Post Logistics service-oriented supply chain execution system.

The business process layer manages the integration process of the supply chain. It monitoring and managing the supply chain from the source to the endings, it is not only to the forward logistics supply chain, but also to the reverse logistics supply chain. Not just to the logistics of

the supply chain, but also it manage the implementation of the integrated process.

The service layer connects the supporting system of the supply chain and the specific business system. The service layer of China Post Logistics service-oriented Supply Chain Execution Systems contains 4 modules, including heterogeneous message broker, routing configuration, the dynamic conversion as well as the service registration / release. These 4 modules set up the connections between the system and the business layer, and it helps China Post Logistics Supply Chain Execution System to manage the business comprehensively and unified.

The application connection layer and the back-end systems related to the specific application and business system module is a system daemon. It can be any program, or even devices complete the corresponding function. This application connection layer connects the back-end system and the service layer, and then connects it with the specific business process layer, so as to control the process of the system. The back-end system is the soul of the supply chain execution system.

2.2 The Architecture Of Process-Oriented Supply Chain Execution System

The business process customization is not only the future direction of the Supply Chain Execution System, but also the key method to build an agile supply chain system. The architecture of process-oriented supply chain execution system of China Post Logistics is shown in Figure 4.

The architecture of process-oriented supply chain execution system of China Post Logistics can be divided into 5 specific levels. Particularly, it is the second tier suppliers, the first tier suppliers, the manufacturers (China Post Logistics), the users and consumers / end-users. These 5 levels ensure the entire supply chain run smoothly. In this process, China Post Logistics manages the customer relationship, customer service, demand, order distribution, manufacture process, procurement and production development and commercialization which run forward, as well as the reverse logistics in the supply chain. This 8 business of China Post Logistics support the company running smoothly.

In the architecture of the process-oriented supply chain execution system, the role played by the China Post Logistics is the manufacture, it is responsible for a lot of work ,such as procurement, research and development (rare), marketing, production, logistics (most) as well as financial operations. The product flows from the initial

suppliers to the final consumer/users. Logistics is the major business of China Post Logistics, China Post Logistics helps customers purchasing raw materials, storage the materials and delivery these materials to the customers. China Post Logistics ensure the right materials delivery to the right place appointer by the right customer with the right quality and quantity at the right time.
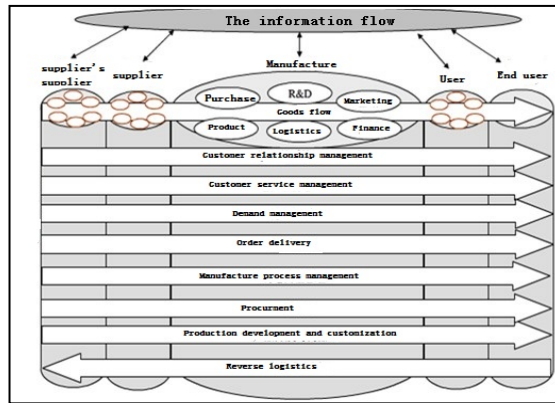

Figure.4 The Architecture Of Process-Oriented Supply Chain Execution System

2.3 The Architecture Of Information Interaction-Oriented Supply Chain Execution System

The information interaction- oriented lawyer is the last step to build an agile supply chain execution system, especially in the information visualization process. China Post Logistics China Post Logistics provides comprehensive supply chain logistics solutions, business process optimization, information visualization, coordinating supervision and advices. China Post Logistics achieve effective control of the entire supply chain costs by visualization. The architecture of information interaction-oriented supply chain execution system of China Post Logistics is shown in Figure 5.
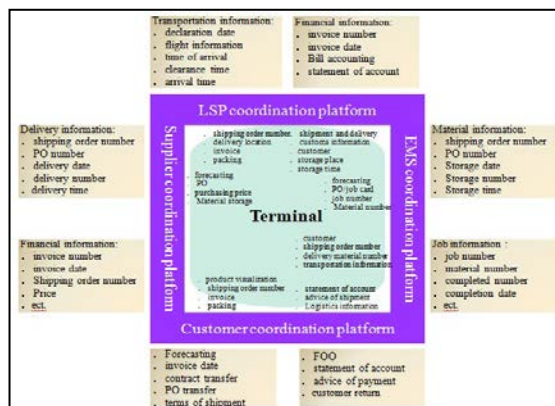

Figure.5 The Architecture Of Information Interaction-Oriented Supply Chain Execution System

LSP collaborative platform is a procurement assessment methods proposed by Jozo Dujmovice in 1980, it is a kind of complex system evaluation, selection and optimization method. The main job of China Post Logistics' platform is to procure the materials, transform the transportation information and the financial information. Such as, the goods declaration, clearance time, arrival time, invoices number and other freight accounting statement.

The supplier collaboration platform and the LSP collaborative platform is similar, the main concern is the shipment information and financial information as well as the shortage information in the procurement process, such as the shipping number, delivery location, the unit price of goods, the purchase discount and the bill. Meanwhile, the platform can also predict the demand in the future, the amount of the purchase orders, the purchase price and so on. The main function of this platform is to communicate the supplier and the demander on the information and cash.

The EMS collaborative information platform focuses on the information of the storage good, such as the storage time, the number of goods, the order statues and so on. This platform is mainly responsible for the information communication and sharing on the order and storage goods with the customers.

The Customer collaboration platform mainly refers to the system between China Post Logistics and its customer, including the visualization of product, shipping orders, invoices, packing and statement of account. This platform is mainly responsible for the communication and sharing on the logistics and cash information with the customers.

China Post Logistics exchange and sharing the information with its customers and suppliers through the four platforms, and it help to achieve visualization of the overall supply chain, so as to control the supply chain cost effectively. For this, China Post Logistics can provide integrated supply chain logistics solutions to its customers,   to optimization its process and the information visualization.

4. THE FEATURE OF CHINA POST LOGISTICS SUPPLY CHAIN EXECUTION SYSTEM

After more than 2 years developing, China Post Logistics supply chain execution system gradually formed its own characteristics, and it can be summary as follows.

1) The system is hierarchical. China Post Logistics supply chain execution system has 3 levels. Respectively, the supply chain execution system interface, supply chain execution system packages, as well as the system background program. In these 3 levels, the core is the system packages and the key is the system background program. The architecture of China Post Logistics supply chain execution systems is clearly and reasonable.

2) The structure of the system is complicated. China Post Logistics has the world's largest distribution network, and it operating lots kind of business and in varieties places. Different kind of business has different characteristics, and it makes a very complicated structure of China Post Logistics supply chain execution systems.

3) The supply chain execution system has a high degree of visualization. It includes the visualization of order life cycle, the visualization of inventory status, as well as the visualization of the entire logistics process. The so-called order cycle visualization refers to the orders process from the prediction, execution, tracking to the settlement that is visual able. Inventory visualization refers to the acquisition and analysis the data from WMS or business partners. Logistics visualization refers to acquisition the logistics and transportation instructions, status and tracing the goods in transition, it can help China Post Logistics to keep abreast of the dynamic and unusual events.

4) The system platform is full-featured. China Post Logistics supply chain execution system has 4 platforms. Respectively, there are procurement execution platform, distribution and implementation of the platform, logistics tracking platform and supply chain data integration platform. Procurement execution platform is responsible for the purchase order management and order tracking, integrating and strengthening supplier business contractions. The distribution execution platform is responsible for the accounts distribution orders and inventory (including in-transit inventory) status at real-time, and it also can provide online order tracking service for large customers. Logistics tracking platform provides real-time query and track inventory changes, master the logistics and transport state, specified the logistics services specification and monitor the logistics costs. The supply chain data integration platform is to achieve the data integration from the enterprises' ERP of the supply chain.

5. CONCLUSIONS

After years of development, China Post Logistics supply chain execution system has gradually formed its own characteristics, and the execution system has played a very important role in its developing. The paper explored the China Post Logistics' Supply Chain Execution System systematically on the base of discussing the relevant knowledge of Supply Chain Execution System, and summed up the four characteristics of Chain Post Logistics Supply Chain Execution System. The analysis of China Post Logistics, not only just to China Post Logistics, but to other similar companies, has a certain reference value on their construction of their own supply chain execution system.

6. ACKNOWLEDGMENTS

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