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Analysis of Development Strategy on Intelligent Logistics in Chengdu Based on Internet of Things

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Abstract: The rapid development of Internet of Things has become an important trend of international economic and technological development, and the logistics industry is an industry first contact with Internet of Things. The concept of intelligent logistics is the tide of history, meets development trends of modern logistics industry automation, networking, visualization, real-time tracking and intelligent control, and is in line with the trend of Internet of Things. Chengdu logistics development has made some achievements. But because of inherent flaws of traditional logistics, making Chengdu to speed up the logistics industry, it is necessary to accelerate the development of intelligent logistics. This paper presents the concept and an advantage of intelligent logistics compared with traditional logistics, analyzes practical significance in the development of modern logistics in Chengdu, and gives strategies on upgrading and restructuring to achieve intelligent logistics in Chengdu.

Keywords: logistics, intelligent logistics, Internet of Things, Chengdu

1 INTRODUCTION

August 2009 Premier Jiabao Wen put forward "Experience China" in Wuxi, and Internet of Things was officially listed as one of the five emerging strategic industries, which was written in "Government Work Report". Currently, the U.S., the EU invested heavily in-depth study to explore Internet of Things. Taking into account the logistics industry is an industry first contact with Internet of Things and the first application of things technology to realize logistics operation intelligence, networking, and automation. China Logistics Technology Association Information Center, Chinese Internet of Things, the editorial of "Logistics Technology and Application," first proposed the concept of intelligent logistics in the industry in 2009.

2 THE DEFECTS OF TRADITIONAL LOGISTICS

Demand is not fully understood in isolation in different information systems, not integrated, so there will be issues of excessive inventory, poor information, and dealing with a single demand.

2.1 Inventory management difficult

Traditional logistics system which is not from the perspective of the overall logistics planning allows manufacturers and retailers are provided with some of the products in stock. This often leads to an increase in inventory on the one hand, the other hand, when it wasn’t able to meet demand. If the supply chain's inventory of each company's corporate point of inconsistency, inventory problems will magnify.

2.2 Poor flow of information

The traditional demand information transfer is slow in traditional logistics system. Therefore, suppliers can’t be superior and timely market information, but feedback on the market more slowly, resulting in distortion of demand information, not selling products in a timely manner to meet the sales demand.

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2.3 Processing requirements of a single mode

Inventory levels of items are similar and disproportionate on the nature, properties, morphology and function. It's lack of special storage and transport for special items. And different conditions and forms of goods through the same logistics network for distribution.

3 THE MEANING AND ADVANTAGES OF INTELLIGENT LOGISTICS

3.1 The meaning of intelligent logistics

Intelligent logistics [1] is a modern integrated logistics system supported by an information technology, where in all aspects of logistics such as transportation, warehousing, packaging, handling, distribution processing, distribution, information services perceives the system to achieve system-aware, comprehensive analysis, timely processing and self-adjustment function, and realizes structured intelligence, found wisdom, innovation wisdom and system intelligence. The concept of intelligent logistics understood from the following aspects:

① Perception. People can use the sensors, RFID, GPS and smart devices auto-sensing the goods and information of means of transport making the parties accurately grasp the information of the cargo, vehicles and warehouses, and other real-time.

② Interoperability. People can use modern information technology, material flow, information flow and capital flow interoperability.

③ Visibility. People can achieve visibility into all aspects of logistics activities.

④ Intelligent. People can use intelligent means to evaluate the cost, time, quality, service and other factors, to achieve forecasts, analysis, scheduling and decision making.

Intelligent logistics gives the traditional logistics with "wisdom of the brain" to maximize the efficiency and level of logistics based on Internet of Things. Internet of Things are "material objects connected to the internet", which is intelligent network system through the use of various types of sensing devices, RFID, video recognition technology, infrared sensing, global positioning systems, laser scanners and other information sensing device, according to the agreed protocol, items needed to achieve interoperability of network connections, information exchange and communication, in order to achieve intelligent identification, location tracking, monitoring and management.

3.2 The advantages of intelligent logistics compared to traditional logistics

Intelligent logistics uses automation equipment to collect and process information generated in the process business flow and logistics, which is to analyze and mining the logistics information, maximize the use of effective information and guidance on the management of logistics activities. Because of openness of the Internet, the entire logistics system has unlimited ability to open and expand. Information flow which is throughout the business has always guided the development of business activities, played a role in pre-measured flow path, real-time monitoring transport process and after the analysis of feedback. Large-scale joint operation reduces the overall system operating costs, improves efficiency, but also reduces the system's dependence on a single node, significantly enhances ability to resist risks. Intelligent logistics will be further extended the information service terminal to storage and transportation equipment, in order to achieve new things mode in the above case. [2]

4 THE IMPORTANCE OF INTELLIGENT LOGISTICS SYSTEM ESTABLISHED IN CHENGDU

As the capital city of Sichuan, Chengdu is an important economic center in western, which has formed industries such as the electronic information, auto mechanics, aerospace, petrochemical, solar photovoltaic, bio-pharmaceutical, etc. Chengdu has the world's most important base of electronic information industry,

national industrial and national new-type industrialization of new energy, new materials industry. Chengdu's GDP is projected to more than seven hundred billion in 2011, accounting for nearly one-third of Sichuan's total GDP. In this context, improving the logistics system, the establishment of intelligent logistics system has important practical significance.

4.1 Achieve the harmonization and optimize the allocation of logistics resources

The establishment of the intelligent of modern logistics system enables the harmonization and the optimal allocation of goods, transportation, warehousing, container yard and other logistics resources in Chengdu. Chengdu's Internet of Things industrial development plan put promoting the development of modern logistics through the development of things as the key demonstration project started one of the six in 2010. It proposed to promote the radio frequency identification, video identification and sensing technology into application of the main part of logistics operations in the production, distribution, warehousing and supply chain management to make the automatic acquisition of logistics information, logos and reliable identification and distribution of goods, safe custody and visual tracking. Chengdu has built logistics information platform and public information exchange sharing mechanism to realization the harmonization of the optimal allocation of goods, transportation, warehousing, container yard and other logistics resources.

4.2 Enhance visualization and intelligent management of logistics process

Intelligent logistics system is a visualization and management system which can achieve in real-time location of vehicles, goods transport monitoring, online scheduling and distribution in the logistics process based on a variety of techniques such as GPS satellite navigation and positioning technology, RFID technology, sensor technology, etc. Development of information technology to the core of Internet of Things known as the third revolution in information technology, countries around the world has been seeking to promote the Internet of Things technology development and application since 2009.

The Chinese Government attaches great importance to the development of things, and to speed up the development and applications of things has been written into the government work report. A series of policy and planning were introduced for the development of things industrial, and things have been a national strategy. Logistics industry as a industry which is the first contact with the concept of thing is in touch with RFID technology as early as 1998 years ago, and has begun to promote application technology of Things based on RFID / EPC sense 2003.

4.3 Form intelligent transportation systems

The establishment of the intelligent logistics system can improve the existing intelligent degree of existing transportation systems, building intelligent traffic control system anticipation with traffic control and road traffic. The main application of technology in the system is RFID, GPS, sensor, video identification and monitoring, laser, infrared, Bluetooth. The intelligent logistics system is established to alleviate the urban disease, such as congestion, traffic jams, etc.

4.4 Improve product intelligence traceability

The traceability system of these intelligent products provides a solid logistics support for the protection of food, medicine and other quality and safety. The use of RFID technology can be traced to the vegetable, to achieve the whole process of supervision of vegetables from planting, medication, picking, inspection, transportation, processing and other aspects. This can be quickly and accurately confirm the legitimacy and origin of vegetable.

4.5 Form intelligent logistics distribution center

This distribution center set up intelligent control of the logistics operation, automation network, enabling linkage of logistics and production to achieve a fully collaborative of the business flow, logistics, information flow, capital flow.

For example, some advanced automated logistics center, on the realization of a robot palletizing and handling, automatic guided vehicles for material handling, automatic conveyor sorting line to carry out sorting operations, the storage operation done automatically by the stacker. Some advanced automated logistics center has achieved a robot palletizing and handling, automatic guided vehicles for material handling, automatic conveyor sorting line to carry out sorting operations, the storage operation done automatically by the stacker.

4.6 Enables part of enterprises to form intelligent supply chain

In an increasingly competitive environment, companies face a large number of individual needs, how can the supply chain more wisdom? How to make accurate forecasts of customer demand? These are the practical problems often encountered in companies. This requires support network based on intelligent logistics and supply chain logistics.

All in all, the establishment of a modern intelligent logistics system in Chengdu can be fully integrated and standardized logistics resources, reduce logistics costs, to enhance the competitiveness of logistics enterprises, promote industrial upgrading and improve government regulation capacity of the logistics industry; eventually it into a set of e-government and regional logistics services in one, integrated, open platform for intelligent logistics information services, and use it as a breakthrough in promoting regional economic development. This system will eventually be built into a regional, comprehensive, open and intelligent logistics information service platform for e-government and logistics service.

5 COUNTERMEASURES FOR ACCELERATING THE UPGRADING OF LOGISTICS INTELLIGENCE IN CHENGDU

5.1 Speed up the application of things technology in the logistics field

5.1.1 Speed up application of RFID technology in the logistics field

RFID is a non-contact automatic identification technology, which the RF signal automatic target recognition and access to relevant data, without human intervention. It can work in harsh environments. RFID tags can be used in automatic warehousing inventory management, product logistics tracking, automated supply chain management, product assembly and production management, product security and other aspects in the area of logistics,. Extensive use of RFID tags can improve management level of the whole supply chain and logistics operations.[3]

5.1.2 Speed up applications of global satellite navigation technology in the logistics field

With the development of networking technology and the revitalization of Chinese logistics industry, mobile Internet of Things based on GPS / GIS technology will be great development. Logistics industry is the most important application industry of mobile Internet of Things. Mobile Internet of Things can monitor the logistics process and goods vehicles, locate and track moving freight vehicles, meet the requirements of modern logistics information. Chinese demand for logistics on the GPS system will be an annual rate of more than 30% In the next few years.

5.1.3 Speed up applications of wireless sensor network in the logistics field

Wireless Sensor Networks has applications in many areas of the logistics, including equipment monitoring of production logistics, storage environmental monitoring, tracking and monitoring of transport vehicles and goods in transit, dangerous goods, and cold chain logistics management. But the current wireless sensor network applications in the logistics industry is very limited, most of applications also have to stay in academic research or experimental development according to field research and literature analysis. Therefore, Chengdu should speed up the application.

5.2 Build intelligent logistics park

Intelligent Logistics Park is a holistic concept; it manages people, vehicles, and materials in the entire park. the elements intelligent logistics park includes from single logistics items to the warehouse, from the work of staff attendance to work，from vehicle access park to adjustment database of goods，and from staff attendance to operation work. Application RFIO technology truly realizes modernization of warehouse, personnel, vehicles management in the logistics parks. [4]

Intelligent Logistics Park can be based on actual customer demand, combined with the warehouse management system, personnel management, vehicle management system, to achieve warehousing operations, staff performance, vehicle, asset management and other aspects of refined management. [5]

5.3 Gradual improvement of intelligent E-Port

Intelligent logistics development in Chengdu should focus on the intellectual intelligent E-Port construction, port construction led to the wisdom of their own dry port development in Chengdu, to enhance its international competitiveness, and promote the development of logistics industry in Chengdu. It should strive to support and guidance by AQSIQ and Customs port management, the progressive realization function of "one-stop, paperless customs clearance". And it should realize data sharing between the airlines warehouse receipts system and airport customs systems, to speed up the flow rate of imported goods as early as possible. Building intelligent logistics system in Chengdu should be developed and implicated of information and electronic reporting system to further improve the efficiency of customs clearance, reduce operating costs, and improve the investment environment to create the conditions a new round of development goals in Chengdu.

5.4 Establish of information platform for logistics services based on things

Chengdu will build the regional, comprehensive, open and intelligent logistics information service platform including e-commerce, e-government and logistics services, and use it as a breakthrough point to promote the upgrading industrial and urban and rural integration restructuring in Chengdu.

Establishment of intelligent visualization loading of freight logistics information system relying on RFID, GPS/GIS, GPRS and other things technology, to build a logistics and freight loading monitoring and management information platform based on networking technology can provide real-time cargo information, the information return picking information, navigation services and network monitoring service for logistics enterprises, cargo owners, and property owners online. Corporate headquarters and logistics operations management department can always see his truck with this platform.

5.5 Accelerate the development of intermodal containers

Chengdu should accelerate the development of intermodal containers to achieve seamless multi-modal transport. Intermodal containers is the use of two or more transport approach to complete the transport of goods, which breaks the past single, traditional ,not mutually coherent practices of only by the sea, railway, highway, and air transport. Intermodal intelligent information management platform is a container platform for the whole process of multimodal service based on things, and it has an important significance for logistics companies to provide full logistics information services and integrated business information services.

6 CONCLUSIONS

Chengdu logistics development has made some achievements. But because of inherent flaws of traditional logistics, making Chengdu to speed up the logistics industry, it is necessary to accelerate the development of intelligent logistics. This paper gives practical significance in accelerating the development of intelligent logistics in Chengdu and measures to accelerate the upgrading and restructuring of logistics intelligence.

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