

# Application Analysis on Internet of Things Technology in the Logistics System

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**Abstract.** With the development of social progress and technology, more and more IT has been used in people's daily live. As an emerging industry, internet of things technology has now been widely used in people's daily production of all aspects of life including logistics industry is one of the main directions of networking technology applications. Years, as government support and increasing market demand, China's logistics industry has developed rapidly, has gradually become China's national economy in the support services industry. But in the course of development, China's logistics system, there have been many problems and the technical level of China's logistics system is also far unable to meet the current market for the logistics system efficiency, security, intelligence and information needs. With the introduction of the concept of networking, networking technology in the logistics system will promote the further development of the logistics system.

## Introduction

Logistics is the process of purchasing, manufacturing, distribution and other aspects of the main components of the social and business development. Third profit source. Under the support of information technology, modern logistics in developed countries has become an important pillar industry of the national economy, a key driver of an important source of improving economic efficiency, corporate restructuring and industrial upgrading, as well as a key factor in economic development and regional innovation supporting environment one. Modern logistics will greatly change the current business and production patterns, and ultimately as a systematic whole becomes part of a basic level of social economy. At present the international community generally believed that the extent and level of development of the logistics industry is an important sign of the level of a country's modernization and comprehensive national strength, modern logistics has become the most widely influential developed economic base and "sunrise industry."

As China's rapid reform put the deepening and economic development, China's modern logistics has been considerable development. Since 2003, China's logistics industry to promote the all-round fast: the whole society's awareness of the logistics deepened, modern logistics has been incorporated into the overall strategy and economic development throughout the country; the total amount of China's logistics industry is growing rapidly, and gradually formed a market regulation oriented operation mechanism; all levels of government has increased investment in transportation, communications and other logistics infrastructure; transport and logistics transportation, information and communication, storage, packaging and distribution, and other industries have made rapid development. Significantly improve the ability of the logistics infrastructure. In recent years, the most significant progress is reflected in the development of China's logistics infrastructure and logistics and transportation equipment, storage equipment, information and communication, and other goods packaging and handling has been greatly developed. Investment information infrastructure is increasing, the rapid growth of information and communication ability in a short time.

Things technology is an important part of the new generation of information technology, the Internet by means of a new technology in the form of sensing technology by the virtual reality space to expand the physical space, but also the countries trying to seize the growing point of the

information technology revolution. It aims to achieve the goods efficient, accurate, safe, green management, control and operation of the integrated operation. Things technology in logistics applications subvert and transform the traditional logistics industry and logistics management, providing strong technical support for the modern logistics system. In the near future, things will be bound to theory and technology deep into all aspects of the field of logistics.

With the continuous improvement of social needs, the requirements of modern logistics have become more sophisticated, including delivery time, cargo security, distribution costs and other requirements are put forward higher requirements. Therefore we need to use modern technology to improve the logistics system, infrastructure and logistics system procedures.

At present, China's logistics system is still in its infancy, a large number of small and medium sized logistics companies also rely on artificial means to manage the logistics, information technology is not high, not enough synergy between the supply chain, poor service terminals which are caused by the logistics companies operating costs the increase affects both the rational development of the logistics system. With the introduction of the concept of networking, networking technology in the logistics system will promote the further development of the logistics system.

### **The Meaning of Internet of Things**

Things, at home and abroad generally recognized professor Kevin Ashton, director of MIT Auto-ID Center in 1999 when the study was first proposed by RFID. In 2005, the International Telecommunication Union (ITU) and the European Union published in 2008 IoT2020 report, the definition and scope of things have changed, the coverage has been greatly expanded, not only based on RFID technology, the Internet of Things.

Essentially, networking is an established pan on the Internet network, the core is the widespread use of Internet by everyone, and to further extend and expand on its basis in order to achieve full interoperability; secondly, things with so communication between things that can be exchanged and information transmission, automatic identification and physical communication objects.

Things refers to various information sensing devices, such as radio frequency identification (RFID) devices, infrared sensors, global positioning systems, laser scanners and various other devices and the Internet combine to form a huge network. Things is emerging frontier areas of research focus multidisciplinary highly cross, which combines sensor technology, embedded computing technology, modern network and wireless communication technology, distributed information processing technology, it is possible through various integrated micro-sensors collaboration real-time monitoring, sensing and information gathering or monitoring various environmental objects, embedded systems processing the information, and by random self-organizing wireless communication networks to multi-hop relay system transfers the perceived information to the user terminal.

### **The System of Internet of Things**

**The Sensing Layer.** sensing layer in the real world in a wide range of various physical quantities through a variety of means, and automated real-time digital information into the virtual world can handle. Perception layer is the foundation of things, the main achievement of the IntelliSense features, including information gathering, object recognition and other functions.

**The Network Layer.** The network layer main achievement transfer and handle traffic information, will perceive the data layer collected and information quickly and securely transmitted to the information demand side, so they can process the information, the main means of transmission, including wireless communications and wired communication (such as GPRS / SDMA network, 2G / 3G / 4G networks, the Internet, etc.).

**The Application Layer.** application layer to achieve the ultimate fusion of things and all walks of life will preclude the perception of data after collection and network layer processing applications requiring the industry, for the final system integration, coordination, decision-making

and intelligence service. Middleware layer and application layer includes application service layer.

Middleware layer main role is the network layer and application layer docking, act as the interface between the middle of the action, including business analysis integration, sharing, data processing, management and so on. The future development of more and more inclined to cloud computing service platform. Currently application layer includes many industries, such as smart home, smart city, smart grid, industrial control, public safety, intelligence and logistics. This paper is mainly devoted to the logistics industry in the application of research.

### **The Application Research on Internet of Things Technology in Logistics Distribution**

The traditional receipt work of a large distribution center is done by manpower, not only inefficient and prone to error. However, after the application of Things technology, especially RFID technology and smart shuttle technology, receiving work becomes simple and effective but also saves a lot of manpower and time to optimize processes and improve efficiency. Specific application process is as follows: Before the distribution of goods, the goods will be affixed to each respective RFID tags, which record the destination, the type and quantity of information goods. After the distribution of goods to the destination, receiving only need to use the appropriate identification device, such as a handheld terminal to scan RFID tag on each of the goods, the corresponding information will be transmitted to the distribution system, and logistics and distribution system will automatically change the assignment corresponding intelligent shuttle completed goods receipt and update data.

Sorting modern logistics and distribution different from the traditional distribution of goods for each individual distribution model, modern logistics distribution and have common characteristics of hybrid and diverse distribution methods, distribution more biased in favor of multi-species, small quantities. The traditional sorting operation has been unable to meet the development of modern logistics, a waste of manpower and material resources, but also a waste of time, but also prone to error. Things RFID technology and automated sorting technology can solve this problem. After receipt link is completed, the goods were sent to work on the dividing ridge automatic sorting machine and sorting equipment by reading the information on the RFID tags of goods, of all types of cargo sorting, storage spaces from the distribution system for the cargo carried next steps

Zero inventory. In many logistics supply chain is difficult to achieve, but also one of the aspects of warehouse distribution centers so indispensable. Modern logistics distribution center and a wide range of goods warehousing flow is very large, so the traditional storage level has been unable to meet the needs of modern logistics and distribution. Application of networking technology can achieve logistics and distribution warehousing sectors of automation, intelligence and memory intensive. In the distribution center can use the following networking technologies: RFID pallet tag, RFID label goods, storage spaces RFID tag, RFID terminal staff, temperature sensor tags, optical sensing tags, readers and other equipment. Through application of these technologies, combined with things established logistics system that can implement the entire warehousing process visualization, intelligence and automation, to achieve a rational allocation of goods, a reasonable allocation of staff, the rational allocation of resources.

### **The Research on Internet of Things Applications Status Quo in the Logistics Distribution**

Since the concept of things made up to now, the national policy to support and promote, China's logistics industry networking technology gradually into the stable, high speed deepening and development stage, the application of networking technology involved in three major industry sectors have gained great development. Automation and intelligent systems in the field of logistics, integrated logistics system project construction machine, light, electricity, sensor, automatic control systems, robotics and other advanced technology and equipment logistics rapid growth, the annual growth rate above 30%; equipped with automatic sensing intelligent technology and product development of logistics equipment was also a great, smart crates, pallets smart, intelligent truck, intelligent conveyor sorting system has developed rapidly.

In the field of logistics, currently the most popular Things sensing technology is RFID technology. RFID technology as a logistics information technology in the current perception of logistics in the penetration rate has reached 70%, RFID tags and smart handheld devices are widely used in mass logistics equipment, such as storage equipment, transportation equipment, container units, etc., RFID technology is mainly used to sense orientation, process traceability, information collection, sorting and other items separately. Data show that China's express delivery industry handheld terminal scanning devices grew by more than 60%, many express courier companies are equipped with handheld terminals scanning device.

Picking in the logistics field, guided by the light on the system chosen RFID picking system has been widely used. The system will first orders for electronic and information processing, broken down into sorting information through the network system will pick the information transmitted to the need to elect the relevant cargo space, and the need to elect quantity and other information through the cargo space above the display lights display guide picker picking chosen according to the indicator once. This technique is simple and practical, the logistics and warehousing fields are widely used. According to the survey, such electronic tags picking system shipments grew more than 35%; In addition, the order information is automatically processed into voice picking system, voice picking a breakthrough in the field of logistics systems is chosen by voice guidance; the sorting information input picking trolley display to guide the chosen technology industry developed rapidly with the chosen car.

Visualization of logistics equipment, real-time video sensor status sensing logistics operations and warehouse management status logistics center video management system is also faster growth, the growth rate of more than 20%. In advanced automatic sorting conveyor system, fully automated warehousing systems, infrared sensing technology, laser sensing technology, RFID sensing technology, two-dimensional code sensing technology and other things sensing technology has been widely applied.

Still the fastest growing technology in the field of intelligent automated warehouse shuttle, and the shuttle intelligent shelf system with a combination of intensive shelves, storage facilities can greatly enhance the utilization of space by means of intelligent shuttle can innermost dense shelf smart cargo handling shipments, which in a single product larger shipments of products in the field is extremely competitive, is the most effective new technology, it quickly gained popularity applications, the growth rate of more than 100%.

## **Conclusion**

Internet of Things will become the information revolution worldwide after the Internet. China should seize the opportunity to develop the key technology of things, to promote the harmonization of networking standards, and promote the development of large-scale networking industry to create a good basis for the development of things. Things in logistics applications promising, has great potential, but it is not a smooth sailing. Things in other fields of application in the problems inevitably exist in logistics applications. Things inevitable problems of development, we believe that with the further development and application of networking technology, these problems will eventually be resolved, thereby facilitating large-scale application of the Internet of Things.

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