Design of Logistics Navigation System Based on Internet of Things

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Abstract: There are many shortcomings in the traditional logistics business. At the same time, the vehicle scheduling is unreasonable. A logistics management system based on the Internet of Things is proposed for the logistics to the era of big data. The basis of hardware support is the Internet of Things technology, which uses tags to collect data, uses wireless networks to transmit data to servers, and combines with GPS navigation to achieve real-time vehicle behavior. Monitoring, thus completing logistics and transportation, and further achieving intelligent management.

1. Introduction

The Internet of things originated from the Internet and can even be regarded as an upgrade of the Internet. Many items can be connected to the Internet. If the agreement allows, they can also connect to the Internet of things. The main purpose of a link is to exchange information. Therefore, it may use many IOT technologies, such as GPS, RFID and infrared sensing [3]. These technologies are highly specialized and realizable. At present, large industries are in a period of reform. This has resulted in the gradual increase of logistics and transportation costs [4], and even the gradual transition to marketization within the enterprise. This affects the economic profit of enterprises, so the logistics navigation design based on the Internet of things has important practical significance.

2. The Internet of things

The Internet of things allows things to connect. If the agreement allows, the Internet of things can realize the mutual communication between the Internet of things, so as to realize the management, detection and other modern functions of objects. Among many technologies, RFID and wireless sensor network are the two cores of Internet of things technology [5]. RFID is mainly responsible for electronic tags, which can enhance the identification of objects. At the same time, we can use the wireless sensor network technology to collect data according to the tag information, to achieve the purpose of automatic identification. Figure 1 shows the RFID in the perception layer.

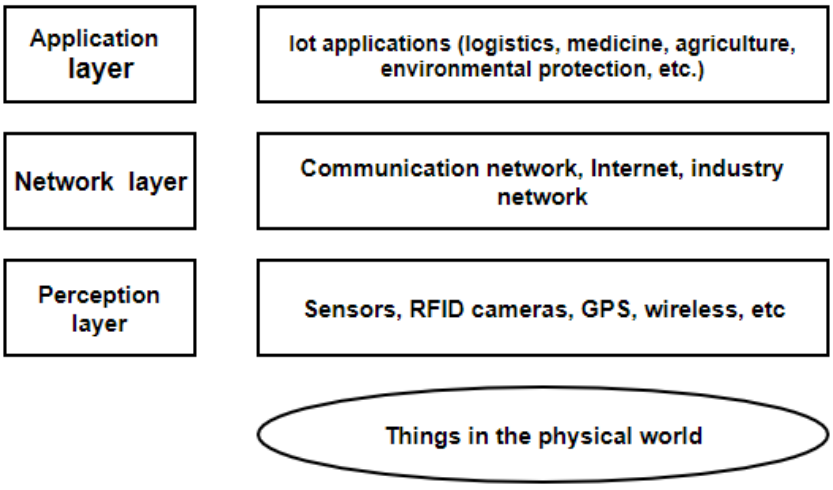

Fig.1. Network architecture

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RFID is currently widely used in the logistics industry electronic information technology; its advantage is that it can play its role of intelligence and information. At the same time, we can use the coded information it carries to identify items and process product information. At present, no other technology can replace this RFID. RFID can share processing process in item reading to ensure the tracking of items [6]. It is more secure than traditional barcodes and has a lot more information. The wireless sensor network is mainly realized by many sensors in the network. We usually use this technology for information transmission, collection and so on. We can also use this technology to remember information processing, fully collect and use information. In the current sensor network technology, it has certain stability. We can build data centers around them, and also cooperate with the network architecture to realize the effective composition of the three layers in figure 1, such as the perception layer, application layer and network layer [7], and finally form the network architecture of the infinite sensor [8].

3. Logistics system

The logistics industry requires fast, efficient, safe and synchronized information, and integrates important logistics links in traditional technologies, including handling and transportation. It can be said that it covers all the traditional logistics industry, and even involves the modern logistics industry. Logistics is a very comprehensive technology, and finally this technology has developed into a relatively new management mode. In today's world, we often need to implement the best services at a lower cost. In order to better serve the transportation needs of users, many enterprises have put forward more requirements in logistics, such as updating equipment. Speech recognition, communication and so on have become the current hot spots. They meet the needs of the development of logistics industry and accelerate the intelligence of information. If modern logistics technology is put into the Internet technology, a new logistics system can be formed and a new framework structure can be constructed to solve some problems encountered in traditional logistics [9]. We can also further reduce the traditional logistics managers lack of experience to bring about problems. Let the intelligent expert system assist the administrator in making appropriate decisions to ensure the safety and reliability of the product during transportation. As shown in figure 2, the new logistics system. This system can be combined with any system, and can produce the corresponding system. Even in the logistics system, enterprises are more able to combine with each other to form a supply chain, which is also a kind of logistics navigation system. It may involve in product integration, or resource allocation [10], and even involve in logistics collection in the future, sometimes in other activities, with certain intelligent auxiliary functions, and achieve a new breakthrough in the development of logistics industry within a certain range.

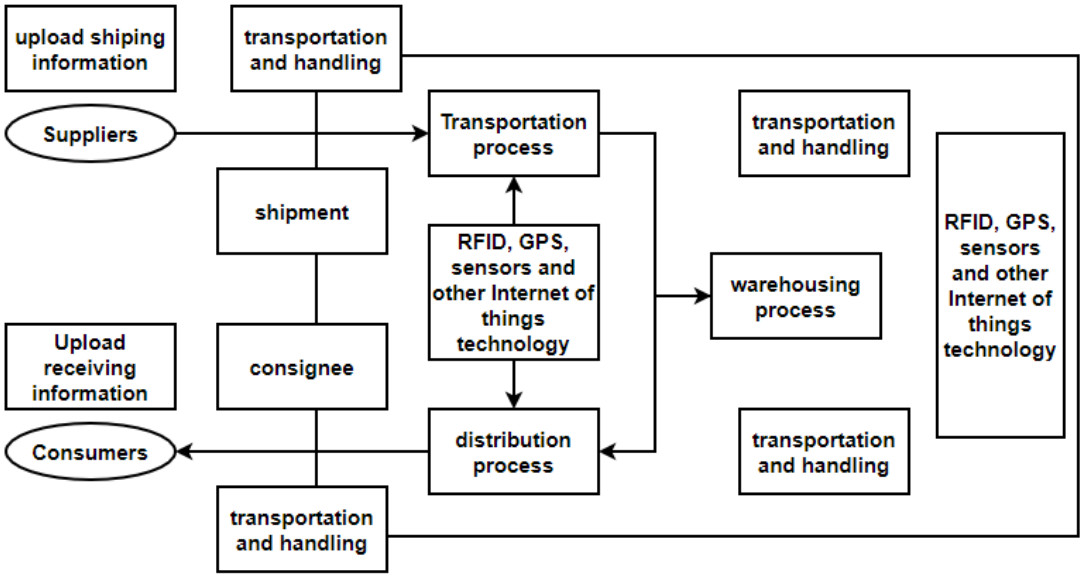

Fig.2. New logistics system

4. Design of navigation system

When the goods enter the navigation system, users can obtain a complete warehouse map. At this point, the user can check the information of some goods in the area through the operation interface, even including the location of the goods, specific properties and so on. We can calculate the optimal path according to the framework of the system, define the operator according to the path, and finally achieve the purpose of picking up the goods.

In order to ensure the system to achieve its best performance. We need to add maps, build tools, and capture WIFI. Only with these conditions can we process and collect data more conveniently and further improve the efficiency of operation.

In order to better realize this functional requirement, figure 3 shows the navigation design framework of the system.

The following sections are set:

First, the electronic map, which mainly depends on the structure of the map to define the topology. In addition, we need to know the surrounding situation of each point in space, use WIFI and obtain the corresponding information. In this way, we can set up various interfaces for map operations and display graphics, such as the map can be scaled or changed.

Secondly, the WIFI location module and part of the navigation module. The user's neighborhood may contain a lot of data information, we usually use the database to complete detailed positioning. We can determine the most suitable route and select the optimal path by specific algorithm according to the data indication.

Thirdly, the modeling of map module is to make topology better information analysis and generate XML. In order to optimize the processing of this file, the structural file is finally obtained.

Finally, the purpose of WIFI information acquisition module is to collect more WIFI information.

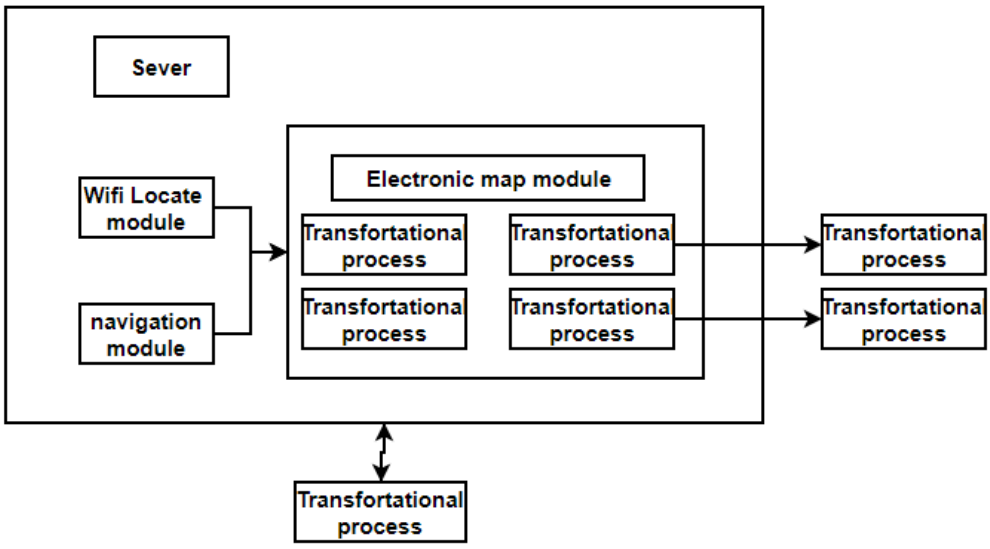

Fig.3. Navigation design framework

The navigation module of navigation system is the core part. This module is mainly based on a specific algorithm to calculate the corresponding circuit in the electronic map, and finally determine the starting point and specific route. The module mainly has two parts:

(1) search for the nearest point. Mainly to solve and consider the electronic map, the topological structure of the problem is difficult, often in the map, by multiple point connection topology is very difficult to control, in general, the position of the lot of goods is very likely not in point, all of them, and then, to determine the nearest point, also need to ensure this point with location must not have obstructions between shade. This is the point that you need to navigate the algorithm.

(2) search for path. This part mainly adopts the starting point determined before, and sometimes

even the target point. Usually, an algorithm is selected to form a navigation route, which is fed back to the corresponding module of the user as far as possible and displayed on the electronic map. Because some point is complex, the design, often have to be zoning for some points, and the recent search for part of the general analysis of the actual location, and determine the position in which region, if in this position, to the point of regional calculation, finally get the recent points, otherwise need to search again, until we determine the position.

In the process of road search, the number of nodes may be relatively large, so we need to choose an appropriate algorithm to reduce the search time and improve the search efficiency.

5. Conclusion

Traditional logistics system has many shortcomings, especially in the real-time performance of data is not ideal. This paper discusses the logistics navigation system based on the Internet of things, and mainly explains the network architecture of the infinite sensor. In order to solve the disadvantages of the original system, this paper constructs a new logistics system. According to the meaning of the navigation system, this paper constructs the navigation framework, hoping to provide some reference for the traditional logistics management.

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