Research on the Intelligent Warehouse Management System Based on Near Field Communication (NFC) Technology

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ABSTRACT

With the continuous development of retail and logistics, enterprise inventory management has become more and more complex, the traditional management mode can’t meet the requirements of modern enterprise inventory management. In the environment of Internet of things, a kind of intelligent warehouse management system based on NFC is studied, which can realize the real time intelligent management of logistics. This paper design the NFC tags to store the warehouse information, freight car information, superior management order, etc., and read it by a smart android mobile terminal which support NFC, then through the communication network to transmit data information, to achieve NFC tag registration, data acquisition, content input, real-time data upload by scanning card, record management, query statistics and analysis report, which is an intelligent warehouse management system. It meets the requirements of modern logistics management, create more economic benefits for the enterprise, and has great realistic significance to promote the economic development of the logistics industry.

KEYWORDS

Identification of Goods, Intelligent Storage, Logistics Management, NFC

1. INTRODUCTION

1.1. Background of the Subject

With the development and popularization of information technology, internet technology has made great progress in solving the problems of information sharing, information transmission, information standards and information costs, and information can be widely used as a basis for regulation and decision-making. More and more enterprises have gradually applied the production automation and office automation and some intelligent information storage management system. Because of the rapid development of information technology, information technology has become an important means to determine the market competitiveness of enterprises. Therefore, in order to improve the new requirements of the enterprise inventory management and improve the efficiency of enterprise
inventory management, it is necessary to establish a complete enterprise inventory management information system.

In recent years, Internet of things has been a hot research topic at home and abroad since it was put forward. Internet of things technology is highly integrated electronic technology, communication technology, automation technology, biotechnology and so on, so as to realize the development of from the interpersonal communication toward the communication between the people and things, and between things and things. It is generally accepted that the Internet of things is the extension and expansion of the Internet, breaking the boundaries of the physical world and the information world. At present, the Internet of things is widely used in intelligent logistics, transportation, security monitoring, smart home, fire warning, environmental monitoring, energy management, remote health care, greenhouse cultivation, food safety and other fields.

Wireless communication technology has become an important sector of the Internet of things, to change the way of life and behavior of human life in many ways. In particular, the development of short-range wireless communications technology including Bluetooth, 802.11 (Wi-Fi), ZigBee, Infrared Data (IrDa), Ultra-wideband (UWB), Near Field Communications (NFC), has set off a wireless communication revolution. Using wireless communication technology and the Internet of things to build a more intelligent storage management system, improve the overall competitiveness of enterprises and management automation.

1.2. Research Status and Trends at Home and Abroad

In recent years, scholars from all walks of life and governments have set off the climax of the study on the Internet of things and its key technologies in the field of logistics traceability, and achieved fruitful results. Through many years of research, as well as the current research situation, study of supply chain inventory is the focal point of the academic research. At present, the mainstream of intelligent storage management system is mainly divided into the warehouse management system based on bar code identification and storage management system based on radio frequency identification (Yang et al., 2009).

The bar code is made up of bar and space with different width, different reflectivity, which seen as a graphical identifier that is used to express a set of numeric or letter symbol information in accordance with a certain coding rule (Hao, 2013). Common bar code has one-dimensional bar code and two-dimensional bar code. The principle of bar code recognition is to use the laser to scan the bar code at near distance to obtain the reflection light of different signal, the reflection light signal is amplified and then passed through the analog digital conversion circuit, converting it into corresponding character information, then the information is uploaded to the computer system through the interface circuit for data processing and management.

RFID is a kind of automatic recognition technology of non-contact, mainly identify target and get the relevant data automatically by radio frequency signal, identify work without manual intervention, it can work in all kinds of bad environment (Xu, 2010). Its basic principle is that the reader through the system antenna to send radio frequency signals of a certain frequency, so that the energy of the electronic tag in the work area of the transmitter antenna is activated; activated electronic tags will sent itself coded information by the built-in antenna, then the system antenna receives the carrier signal of the electronic tag and sends it to the read and write device, read/write device receives information for demodulation and decoding operation, finally uploaded to the backstage data system for data processing. In this paper, the NFC is developed on the basis of RFID, RFID and NFC are not much different in essence, they are both based on the signal transmission between the two objects of adjacent geographical position.
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