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Enhancing Logistics Tracking Accuracy and Timeliness Using High-Speed Monitoring Terminals

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Abstract: In the era of economic globalization, the timely and accurate feedback of logistics information is critical for ensuring smooth transactions between businesses and consumers. Traditional logistics tracking systems, primarily relying on GPS devices, often fail to provide precise location updates, resulting in customer dissatisfaction. This study introduces an innovative logistics tracking system that leverages high-speed monitoring terminals to enhance the accuracy and timeliness of logistics information. By integrating vehicle license plate recognition and real-time route monitoring, the proposed system ensures reliable updates on the transportation status of goods. The high-speed monitoring terminals collect and transmit vehicle tracking data to a centralized server, which then generates and pushes logistics information to both delivery and user terminals. This method significantly improves the precision of logistics tracking, thereby enhancing the overall quality and reliability of the supply chain.

Keywords: Internet of things; Freight transportation; Tracking system.

1. Current Technology

With the rapid development of economic globalization, the supply of raw materials between enterprises and the timely feedback of goods transportation information between businesses and consumers affect whether the transaction between enterprises and consumers can be carried out smoothly. Therefore, the timeliness and accuracy of logistics goods transportation information feedback is becoming more and more important. Logistics tracking was originally used by logistics enterprises to track the flow direction of internal goods. The perfect tracking system depends on the time of each transportation, sorting, transfer and distribution, and even can be accurate to the accurate time of each link.

However, most of the goods are affected by the GPS positioning device in the process of transportation, and most of them are affected by the GPS positioning device during the transportation process, It may not be able to accurately report the location information, so that customers cannot query the logistics information or the logistics information inquired is inaccurate, which reduces the tracking accuracy. This design is put forward in response to this problem, in order to realize the accurate identification and real-time tracking feedback of the transported goods.

2. Design Content

The purpose of the present disclosure is to provide a goods transportation tracking system based on the Internet of things, so as to solve the problem of low accuracy of logistics goods transportation tracking in related technologies.

In order to achieve the above purpose, the embodiment of the present disclosure provides a cargo transportation tracking system based on the Internet of things, including a server, a delivery terminal communicating with the server, a high-speed monitoring terminal communicating with the server, and a user terminal communicating with the server; The delivery terminal is used to obtain the loading information of logistics goods, in which the loading information includes the license plate number of the transport vehicle, determines the logistics transportation route of the logistics goods according to the delivery address information and receiving address information of the logistics goods, and sends the distribution information including the license plate number and the logistics transportation route to the server; The server is used to determine the target high-speed monitoring terminal from the high-speed monitoring terminal according to the logistics transportation route in the distribution information, generate license plate number acquisition instructions according to the license plate number, and send license plate number acquisition instructions to the target high-speed monitoring terminal; The high-speed monitoring terminal is used to receive the license plate number acquisition instruction sent by the server, collect the license plate number of the transport vehicles within the monitoring range according to the license plate number acquisition instruction, and send the target tracking information to the server when the license plate number is collected. The server is also used to generate logistics information according to the target tracking information, and push the logistics information to the delivery terminal and user terminal. The logistics information is used to display the transportation status of logistics goods.

3. Client Design

The system also includes a vehicle network terminal, which is set on the transport vehicle, and is connected with the server through communication;

The Internet of vehicles terminal is used to send the real-time location information of transportation vehicles to the

server; The server is used to receive the real-time location information sent by the Internet of vehicles terminal, and find out whether there is a target high-speed monitoring terminal within the target range according to the real-time location information, and if there is a target high-speed monitoring terminal within the target range, the driving speed of the transport vehicle represented by the real-time location information within the target time is used, And the location information of the target high-speed monitoring terminal and the transport vehicle represented by the real-time location information, the time node when the transport vehicle reaches the monitoring range of the target high-speed monitoring terminal is predicted, and the time node is sent to the target high-speed monitoring terminal; The high-speed monitoring terminal is specifically used to collect the license plate number of the transport vehicle according to the appearance of the transport vehicle when the time point reaches the time node, and send the target tracking information to the server when the vehicle license plate number is collected.

The server is also used to determine that the transport vehicle fails to arrive at the target high-speed monitoring terminal on time if the target tracking information sent by the target high-speed monitoring terminal is not received within the preset range of the time node; When the transport vehicle fails to arrive at the target high-speed monitoring terminal on time, the logistics correction information is generated and sent to the delivery terminal. The logistics correction information is used to modify the logistics information of logistics goods.

The target range is determined according to the current congestion information of expressway, in which the target range is positively correlated with the current congestion information of expressway.

The high-speed monitoring terminal includes high-speed service area monitoring camera, high-speed charging camera and high-speed overspeed camera.

4. Specific implementation

The specific implementation mode of the present disclosure is described in detail with reference to the attached drawings. The present disclosure and the present disclosure are intended to be interpreted and not limited herein.

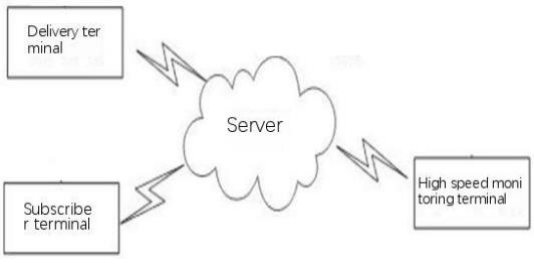

Figure 1. Is a schematic diagram of the cargo transportation tracking system of the Internet of things

In view of this, the design embodiment provides a cargo transportation tracking system based on the Internet of things. Fig. 1 is the schematic diagram of the goods transportation tracking system based on the Internet of things according to an example. The logistics cargo transportation tracking system 100 based on the Internet of things includes: server 110, delivery terminal 120 communicating with server 110, high-speed monitoring terminal 130 communicating with server 110, and monitoring and tracking system based on Internet of things user terminal 140 communicating with the server;

The delivery terminal 120 is used to obtain the loading information of the logistics goods, wherein the loading information includes the license plate number of the transport vehicle, determines the logistics transportation route of the logistics goods according to the delivery address information and the receiving address information of the logistics goods, and sends the distribution information including the license plate number and the logistics transportation route to the server;

The server 110 is used to determine the target high-speed monitoring terminal from the high-speed monitoring terminal according to the logistics transportation route in the distribution information, generate license plate number acquisition instructions according to the license plate number, and send license plate number acquisition instructions to the target high-speed monitoring terminal;

The high-speed monitoring terminal 130 is used to receive the license plate number acquisition instruction sent by the server, collect the license plate number of the transport vehicle within the monitoring range according to the license plate number acquisition instruction, and send the target tracking information to the server when the license plate number is collected. The target tracking information is used to represent the monitoring range of the transport vehicle passing through the high-speed monitoring terminal;

The server 110 is also used to generate logistics information according to the target tracking information, and push the logistics information to the delivery terminal 120 and the user terminal 140, and the logistics information is used to display the transportation status of the logistics goods.

Among them, the delivery terminal 120 can be the warehouse delivery terminal, and the delivery terminal 120 can also be the warehouse delivery terminal. For example, when the delivery terminal 120 is the warehouse delivery terminal, the delivery terminal obtains the loading information of the logistics goods according to the delivery information of the logistics goods.

The above-mentioned system is used to obtain the loading information of logistics goods through the delivery terminal. The loading information includes the license plate number of the transport vehicle, determines the transportation route according to the delivery address and receiving address of the logistics goods, and sends the distribution information including the license plate number and transportation route to the server; The server is used to determine the target high-speed monitoring terminal from the high-speed monitoring terminal according to the transportation route in the distribution information, generate acquisition instructions according to the license plate number, and send the acquisition instructions to the target high-speed monitoring terminal; The high-speed monitoring terminal is used to receive the acquisition instructions sent by the server, collect the license plate number of the transport vehicles within the monitoring range, and send the target tracking information to the server when the license plate number is collected; The server is also used to generate logistics information according to the target tracking information, and push the logistics information to the delivery terminal and user terminal. The logistics information is used to display the transportation status of logistics goods. The license plate number of transport vehicles is collected based on the high-speed monitoring terminal, which can timely understand the status of logistics transportation, so as to improve the timeliness of

logistics update.

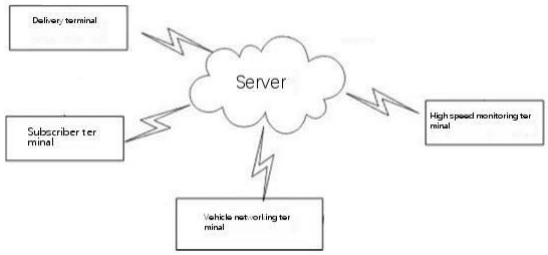

Figure 2. Is a schematic diagram of the system

Fig. 2 is a schematic diagram of another cargo transportation tracking system based on the Internet of things according to an example. The system 100 also includes a vehicle network terminal 150, which is set on a transport vehicle, and the Internet of vehicles terminal 150 is communicated with the server;

The Internet of vehicles terminal 150 is used to send real-time location information of transport vehicles to the server;

The server 110 is used to receive the real-time location information sent by the Internet of vehicles terminal 150, and find out whether there is a target high-speed monitoring terminal within the target range according to the real-time location information, and if there is a target high-speed monitoring terminal within the target range, the driving speed of the transport vehicle represented by the real-time location information within the target time is also used, And the location information of the target high-speed monitoring terminal and the transport vehicle represented by the real-time location information, the time node when the transport vehicle reaches the monitoring range of the target high-speed monitoring terminal is predicted, and the time node is sent to the target high-speed monitoring terminal;

The high-speed monitoring terminal 130 is specifically used to collect the license plate number of the transport vehicle according to the appearance of the transport vehicle when the time point reaches the time node, and send the target tracking information to the server when the license plate number is collected.

Alternatively, if the license plate number of the transport vehicle is not obtained within the monitoring range of the target high-speed monitoring terminal, the target high-speed monitoring terminal with the license plate number collected last is determined, and the early-warning information is generated according to the target high-speed monitoring terminal and the target high-speed monitoring terminal which collected the license plate number.

The server 110 is also used to determine that the transport vehicle fails to arrive at the target high-speed monitoring terminal on time if the target tracking information sent by the target high-speed monitoring terminal is not received within the preset range of the time node;

When the transport vehicle fails to arrive at the target high-speed monitoring terminal on time, the logistics correction information is generated and sent to the delivery terminal. The logistics correction information is used to modify the logistics information of logistics goods.

The target range is determined according to the current congestion information of expressway, in which the target range is positively correlated with the current congestion information of expressway.

High speed cameras, high-speed cameras, and high-speed surveillance services are included.

5. Innovation

The loading information includes the license plate number of the transport vehicle. The transportation route is determined according to the delivery address and receiving address of the logistics goods, and the distribution information including the license plate number and transportation route is sent to the server; The server is used to determine the target high-speed monitoring terminal from the high-speed monitoring terminal according to the transportation route in the distribution information, generate acquisition instructions according to the license plate number, and send the acquisition instructions to the target high-speed monitoring terminal; The high-speed monitoring terminal is used to receive the acquisition instructions sent by the server, collect the license plate number of the transport vehicles within the monitoring range, and send the target tracking information to the server when the license plate number is collected; The server is also used to generate logistics information according to the target tracking information, and push the logistics information to the delivery terminal and user terminal. The logistics information is used to display the transportation status of logistics goods. Based on the high-speed monitoring terminal, the vehicle license plate number can be collected, which can timely understand the status of logistics transportation, so as to improve the timeliness and accuracy of logistics update.

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