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IOT in Supply Chain Management

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A B S T R A C T

In recent years, the supply chain has become more agile and responsive through the use of upcoming technologies such as the Internet of Things (IoT), artificial intelligence (AI), blockchain, and so on. Many researchers have reported the usefulness of integrating IoT into the supply chain to enhance its performance. The use of the Internet of Things has led to the appropriate sharing of information in the supply chain. Information sharing is the most important factor in achieving the desired supply chain performance goals. Information sharing has been seen as an important resource in recent years. Information sharing leads to effective monitoring of the performance of supply chain partners. The partners of the supply chain mainly consist of suppliers who play an important role in its performance. Supply chain management has existed and evolved over the past hundred years. This report takes into account in detail the history of the development of supply chain management. The literature review shows that over the years, conventional supply chain management, which relied on manual and laborious information gathering and tracking of goods, has evolved into intelligent supply chain management. Starting with simple RFID-based tagging to identify goods, the development of sensor-based technologies and communication devices has played a large role in the overall development of intelligent supply chains. It is understood that a variety of IoT infrastructure layers work to collect and communicate information to track the location, quality and on-time delivery of goods. Today, IoT applications not only track goods, but also intelligently predict situations and help protect and reduce losses. Today, complex algorithms are in place to drive IoT applications in various supply chains

Keywords: IOT, Internet of Things, RFID Tags

1. Introduction

More than half of all human life is supported by agriculture, which also contributes to the total economic success of India. This industry faces a number of difficulties, including limited water supplies, labor management, product marketing, etc. Of course, managing water is one of the major issues in this area. Traditional agricultural methods need to be modernized in order to increase crop output over the same area of the field. Smart farming, which is a more exact and controlled process for crops, is necessary to assist farmers in increasing agricultural productivity. In the agricultural industry, It can be used in a variety of ways to help farmers produce more. Smart planning and analysis, smart control, and smart sensing and monitoring are the three key processes. Precision farming eliminates unintentional waste of raw materials. According to research, precision farming increases yields by 40-60%, which increases premium prices by 30% and allows farmers to live better lives. For the most part, inadequate water management results in a lower-than-optimal water consumption rate, and occasionally, a specified amount of water is wasted. Therefore, in order to monitor and manage the crop and soil and get the highest yield, we need a model. The crop's maturity stage has a significant impact on the quality of the crop during ripening and its marketability after ripening. Farmers' capacity to determine crop maturity will be a huge aid in maximizing the harvesting period and preventing the collection of either an under or an over-matured crop.

Objective Of Research

• To develop a system that can be used by Inventory management and warehouse management

• To develop a system which helpful for the supply chain to identify the issues.

• This system can prove to be helpful in supply chain, to detect the details of the product

2. Proposed Work

The data is then transferred to the platform in JSON/XML/HTML formats, which are common data formats for real-time data transfer. Through an authenticated cloud API service and some logic creation in the back-end process, the collected data can be managed in a cloud database. It is also capable of integration with other data that has been pre-loaded in the database. As a result, it can support the development of the proposed occupational safety risk management system, including web event processing and querying. The cloud database contains not only dynamic sensor data, but also static data

from real cold chain operations. Database structure for IoTRMS development, covering both dynamic and static workplace data. There are eight main data tables, namely product information, cold accident record, personal constitution, measurements, environmental sensor data and personal health data, device data and WMS. The IoT service platform enables usage monitoring in addition to the typical data extraction, transformation and loading, and is integrated with NoSQL to achieve complicated data transfer and management tasks. Therefore, all retrieved data can be managed in an organized manner to formulate dynamic risk management in cold chains. This module proposes a fuzzy logic approach to occupational safety risk management that is able to take into account uncertain information in system design. The occupational safety risk should be great for warehouse workers who are old and in poor health. However, there is no detailed deterministic approach to assess exact amounts by age and health status. The occupational safety risk assessment process includes a number of input options to achieve definitive outputs. The inference mechanism adopting fuzzy membership functions and fuzzy rules is able to mimic human reasoning and provide some flexibility and levels of possibility in integrating knowledge from domain experts in companies. The required data is extracted from the cloud database under the IoT service platform to perform real-time dynamic fuzzy logic assessment. In addition, useful data assimilation and knowledge are co-referenced and stored in a knowledge repository, where they are collected through interviews with subject matter experts and historical data acquisition.

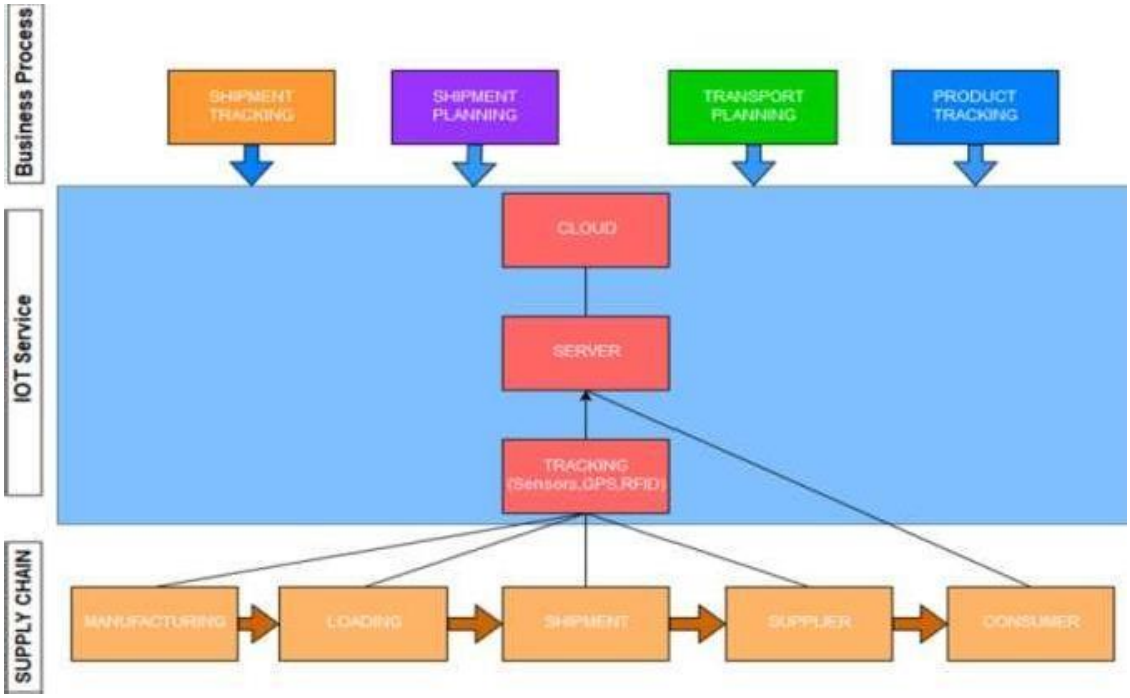

Fig. 1 - System Design.

3. RESULTS

Real-time tracking: IoT devices can provide real-time tracking of goods, allowing companies to monitor their inventory, delivery times and product conditions throughout the supply chain. Predictive analytics: IoT devices can collect data on various aspects of the supply chain, such as temperature, humidity and location, allowing companies to use predictive analytics to optimize their operations and prevent supply chain disruptions. Reduced costs: With real-time tracking and predictive analytics, companies can reduce costs by optimizing inventory levels, minimizing waste and improving lead times. Increased efficiency: IoT devices can automate various processes such as inventory management and shipment tracking, reducing the need for manual labor and improving overall efficiency. Improved customer satisfaction: IoT devices can provide customers with real-time updates on the status of their orders, reducing delivery times and increasing customer satisfaction. The business and its suppliers should agree to implement an RFID system at the supplier's site or access data from the supplier's IoT system to obtain real-time information on the supplier's inventory, delivery statuses, schedules and routes. In this way, manufacturers can respond to changes in suppliers' production operations in a timely manner and thus reduce the risks of delayed and backlogged orders. With RFID-tagged inventory items, inventory specialists and storekeepers gain real-time visibility into the locations, conditions, and flows of raw materials and finished goods as they move within and between facilities. Manufacturers use data obtained from RFID systems and sensors installed in vehicles to monitor delivery conditions and ensure timely deliveries and the correct quality of transported goods. RFID readers obtain the IDs of tags attached to objects and transmit them to the cloud along with the reader ID and read time. By knowing the location of the readers, the inventory specialists will learn the location of the tags. By tracking tag data over time, workers track the movements of each object

4. Conclusions

It concludes that supply chain management in various industries has evolved significantly from earlier manual, labor-intensive and risky operations to real-time, automated and largely risk-free operations. The advent of IoT and its applications in supply chain management has developed to such an extent that it has not only helped track the transit of goods but has impacted on effective inventory management and reduced losses in supply chains. This has led to major economic benefits for companies and has helped expand supply chain operations across large geographic areas. From simple devices to identify goods to a complex network of physical devices working in a coordinated manner, the application of the Internet of Things has provided greater visibility into the production of goods as well as the supply chains to deliver the finished goods to the end user. The supply chain performance variables listed here are most impacted by IoT.

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