The Application of Artificial Intelligence-based IoT Technology in Regional Economic Statistics

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Abstract. Informatization is the only way for the third-party logistics enterprises to achieve leapfrog development, which is also the key to the development of modern logistics. However, the Internet of things (hereinafter referred to as IOT) is the extension and development of information technology. Therefore, IOT will be introduced into the third-party logistics enterprises, which is also an important direction of regional economic development in the future. The huge potential market of IOT can better promote the development of regional economy. As an information technology means, IOT can effectively integrate many industries, which will improve the growth of green economy. Through artificial intelligence, IOT technology can play an important role in regional economic statistics. This paper first analyzes the influencing factors of the statistical data collection of IOT. Then, this paper puts forward the application of IOT technology in regional economic development.

Keywords: The Internet of Things, Artificial Intelligence, Regional Economic Statistics

1. Introduction
IOT is a new way of information acquisition and information processing, which is a way to connect logical information with the objective physical world. By changing the way people collect data, we can connect the physical world, the computing world and the human society, which will have a profound impact on the collection of statistical data[1]. Through the combination of statistical data collection and IOT, we can provide reliable data sources for industrial statistics, which will improve the efficiency and data quality of regional economic statistics[2].

At present, many industrial enterprise statistical data collection still stays in the traditional way, which leads to many economic data information can’t be obtained by manual collection. Through the timeliness, integrity and accuracy of manual data collection, we can avoid many deficiencies. Through IOT technology based on sensor perception, enterprises can efficiently, accurately, real-time collect and statistics data, which will be better for the government departments to make decisions accurately and quickly according to the perception information. Therefore, IOT technology has important practical significance in regional economic statistics[3]. Through the healthy development of IOT, China can promote the continuous development of regional economy. As an integrated innovation
product, IOT technology needs good cooperation with many industries, which can realize the win-win development of enterprises\[^4\].

2. Analysis on influencing factors of IOT technology statistical data

2.1. Application status of IOT technology
In the process of enterprise production, IOT data acquisition technology mainly includes barcode technology, magnetic technology and RFID technology. The traditional manual data acquisition has been unable to adapt to the pace of industrial informatization. Therefore, IOT technology has become the main way, which can better serve the needs of the modern market. Through the industrial statistics report making system or software, enterprise employees can quickly input query and process data, which will improve the convenience and accuracy of regional economic statistics\[^5\]. Based on the standardization of sensor technology and RFID technology, IOT technology can better collect intelligent economic data, which will standardize and automate the collection of report data. At present, SCADA (data acquisition and monitoring control) system is widely used in industrial enterprises, which can automatically collect data and real-time feedback. Through IOT technology, enterprises will timely and accurately adjust the plan control and dynamic scheduling, which will also provide timely and accurate information support. Based on the research at home and abroad, this paper formulates the influencing factors of IOT technology statistical data\[^6\]. As shown in Figure 1.

![Figure 1. Influencing factors model of data acquisition of IOT technology](image)

2.2. The influence of enterprise's own factors
Different types of enterprises have certain differences in the management mode, which leads to differences in the application process of IOT. Informatization is the basis of IOT technology for data collection, which is the basic influencing factor of the application of IOT technology in industrial statistics. The importance of statistical work is mainly reflected in the application of modern science and technology in statistical work and the investment of statistical work, which affects the possibility of data collection of IOT technology in enterprises. The working ability and technical level of enterprise statisticians will affect the application effect of IOT data acquisition technology.

2.3. Influence of application factors of IOT technology
The three-tier architecture of IOT is open to each other and work together, which is the basis of the operation of IOT. In addition, IOT covers a wide range of technical fields, which requires a set of unified standards as a standard. China's IOT is in the primary stage of establishing standards and platforms. At present, China's IOT technology mainly lacks the standardization of interface and data...
model, which affects the application and development of IOT technology. At the same time, the construction of the sensor network requires that RFID tags be embedded in the related articles in advance, which may lead to the infringement of the privacy of enterprises or individuals. Therefore, we must protect the privacy of users from infringement, which has become the key to the application of IOT technology in statistical data.

2.4. Influence of external environmental factors
IOT data collection is a platform to promote resource sharing and business collaboration among government departments. The traditional decentralized development mode has been unable to meet the needs of IOT technology application under the new situation. Based on the public framework of high informatization, we can promote the integration of existing system resources as a whole, which can truly realize the comprehensive application of IOT technology in regional economic statistics. IOT applications need to integrate all social forces, which requires a set of policies and regulations to adapt to the application of IOT. Through the policy and regulation guarantee system, the government can guarantee the development of IOT. The application of IOT technology in statistical data collection will be affected by many problems, such as conservative concept, imperfect policies and regulations, and network information security.

3. The role of IOT in regional economic statistics

3.1. Development of smart economy
Smart economy is an innovative economic development mode under the application of new generation information technology such as artificial intelligence, IOT, big data, etc. Through the optimization of economic structure, the process of modern economic development is more convenient and intelligent. At present, artificial intelligence and ubiquitous IOT have risen to the national strategic level. By integrating the artificial intelligence IOT into the real economy, we can inject new impetus into the economic development, which will drive the new technological form of the development of smart economy. As a new form of economic development, smart economy will promote the quality and efficiency of economic development. Intelligent industrialization is the development of basic industries and leading industries such as artificial intelligence, IOT and big data. Through IOT technology, we can realize the transformation and upgrading of the traditional economy, which will change the mode of economic development. By digitizing and intelligentizing economic activities, we can better count regional economy.

3.2. Economic data collection
Data collection is a process of collecting external data and transferring it to internal system through a specific system. The purpose of collecting data is to be able to use the collected information. Through the modular hardware and application software in the Internet, we can fully understand all kinds of data in the production and operation of enterprises. Based on the needs of economic statistics, enterprises can carry out different information collection work, which will achieve the common goal. Generally, public facilities and retail enterprises are involved in more information collection.

4. Application of IOT technology in regional economic statistics

4.1. Application on the quality traceability management of agricultural and sideline products and drugs
The circulation process of agricultural and sideline products, drugs and other commodities includes four stages: raw material production, processing and packaging, commodity circulation and supply and sales. IOT can summarize and extract the common characteristics of commodities through the technology of entity code (ecode), which will give each single product a unique code. Through ecode coding, agricultural and sideline products, drugs, auto parts and other commodities can be collected,
tracked and managed in the process of circulation, which will realize the whole process quality management of commodity circulation. At the same time, the quality traceability management system should be connected with the national IOT management service platform. Through the national IOT platform to provide commodity ecode coding information, consumers can query all the traceability information of each commodity circulation four stages, which will realize the visual monitoring of the whole traceability process from the production place to the consumers. Through the establishment of commodity quality and safety information database, consumers can find the source of the supply chain according to the traceability process once they find the quality problems, which will effectively control the goods in real time and recall the manufacturers. Through IOT technology, the government can protect the quality traceability management of regional economy, which ensures the legitimate rights and interests of consumers.

4.2. Application in the field of characteristic commodity logistics

IOT has been integrated with telecommunication network, computer network and cable TV network. Through various kinds of sensor technology, M2M technology, intelligent processing technology, etc., IOT technology will be gradually integrated and applied in the field of modern commodity logistics. IOT (IOT) technologies mainly used in the storage process of commodity logistics include RFID, wireless sensor, infrared, etc., which are mainly concentrated in warehousing operation, goods inventory, warehouse location management, outbound operation, environmental monitoring, goods return and replacement, etc. In the process of commodity logistics, the main application of logistics network technology includes GPS and RFID technology. Among them, RFID technology can realize the visualization of transportation process, and GPS technology can realize the positioning and management of vehicles. The transportation of goods includes vehicle scheduling, vehicle measurement monitoring, transportation route selection, vehicle real-time monitoring, etc. Through IOT technology, vehicle scheduling can scientifically manage resources and dispatch vehicles.

5. Conclusion

This paper analyzes the influence on regional economic statistics from three aspects: enterprise's own factors, IOT technology application and external factors. Therefore, this paper puts forward some suggestions. First, enterprises should further improve the degree of informatization. Enterprises should integrate forward-looking statistical management ideas and technical means into IOT data acquisition system. Through configurable modular combination, enterprises can meet the demand of government regional economic statistics data collection, which realizes the synchronization of functionality and ease of use. Therefore, through the implementation of IOT data acquisition system, we can improve the quality of enterprise statistical data collection. Second, government statistical departments should make unified planning as soon as possible, which will promote the application of IOT technology in statistical work. Based on the statistical data collection platform architecture of statistical departments, enterprises can build a unified statistical data collection platform, which will facilitate the construction and utilization of various business systems of government statistical departments. Third, strengthen the application of IOT technology in statistics. The relevant government departments should improve the relevant laws and regulations, which will better protect the safety, health, sustainable and effective development of IOT data acquisition system.

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