



Optimization of Asset Management System Based on Computer Aided Technology of Internet of Things

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Abstract. Fixed asset management is an important task for enterprises and institutions to manage the value of goods. Due to the various types of goods involved in fixed assets, the management process is complicated, so that there are management problems such as incomplete collection of item information, untimely information update, and cumbersome business processing. In order to solve the above problems and improve the management level, the main requirement of this article is to use the Internet of Things RFID technology to establish a fixed asset management platform based on the Internet of Things technology. First, the fixed asset information can be quickly exchanged with the asset management information platform. To achieve the purpose of efficient asset management; secondly, use the medium and long-distance recognition technology of the Internet of Things to establish the asset area management function, install identifiers in the access channels of the assets, and the system can automatically issue an alarm when a fixed asset passes illegally and enters the specified range. This function It can effectively protect the valuable assets of the enterprise. This article mainly studies the architecture design and detailed system design of the asset management system based on the Internet of Things technology, and implements the development of the enterprise fixed asset management system based on the Internet of Things technology, combining the Internet of Things technology and adopting the corresponding information system to achieve the company's fixed assets are recorded and the assets are monitored throughout their entire life cycle to achieve reasonable and efficient use and deployment of fixed assets, optimize and simplify the asset management process, and ensure the reliability and integrity of asset data; Economic and social benefits.

Keywords: Internet of things; asset management; computer

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1 INTRODUCTION

The Internet of things refers to the Internet between physical objects. It uses radio frequency identification (RFID), infrared sensors, global positioning systems, and other information sensing facilities to interconnect designated physical objects through a network according to a preset protocol, and exchange information between them. It can realize the functions related to intelligent recognition and positioning of objects. The Internet of Things (IOT) is the third wave in the history of the world's information industry through the integration of intelligent perception, recognition technology, computing capabilities and transmission networks after the birth of computers and the Internet.

The milestone event of the Internet of Things is the Smart Earth strategy proposed by IBM in November 2008. The strategy proposes that in the new stage of civilization development, mankind will fully integrate smart facilities and physical facilities through the network to achieve comprehensive and in-depth integration of computer networks and various industries. Ahsan et al. [1] realizes the scientific management of the social system and the natural system by mankind.

In recent years, Zhang et al. [2] thought the core technology of the Internet of Things radio frequency identification technology, that is, the application of RFID (Radio Frequency Identification) technology in various industries has been rapidly developed, especially in some large-scale key places and projects for large-scale promotion and application, and more It is the application level of the Internet of Things that has been greatly improved. Zhong [3] considered in foreign countries, the retailer Metro has been applying RFID technology in the retail sector. Currently, in Europe, RFID applications have been fully moved from the back-end asset warehouse management to the front-end merchandise sales link; in China, all luggage at Beijing Capital Airport is controlled by RFID The system, the Beijing Olympic Games adopted RFID electronic tickets, and the entire line of China's high-speed railways used RFID electronic tickets. All of these have brought new development to the Internet of Things industry, and at the same time opened up new development ideas for the Internet of Things industry.

Since the birth of the Internet of Things, Keivanpour and Kadi [4] mention enterprises have introduced this technology into the sight of asset management. The continuous maturity of the Internet of Things technology has not only laid a good foundation for the acquisition of original asset information of the assets operated by enterprises and the independent generation of asset lists, but also The automatic identification of assets and the formation of asset data in a short time provide convenience. At the same time, Lee et al. [5] think the Internet of Things technology can play a broader role in all aspects of enterprise operations, including product production, transportation and sales, and process management. It provides the possibility to build the real-time sharing of global item information on the Internet, which can help promote the development of Industry 4.0, greatly reduce the degree of human intervention in the future, and improve the automation and intelligence of enterprises [6,7].

In the daily production of enterprises, fixed asset management is an indispensable link. If enterprises want to strive for the upper reaches in the development, they need to abandon the previous management mode. Under this circumstance, the Internet of Things has shown its own superior capabilities, and the company's fixed asset management is based on it. If the asset management system based on the Internet of Things technology can be effectively used for the company's fixed asset information management, Save a lot of labor, cost and time. At the same time, this type of management system will make the company's fixed asset management more accurate, stable and efficient. Especially for large enterprises, due to the relatively scattered distribution of assets, the location and environment of assets are dispersed to a certain extent, the asset management system introduces an architecture model based on the Internet of Things technology to conduct efficient data transmission and interaction between asset data and asset

management systems, And the Internet of Things technology can ensure fast and smooth data flow in different use environments. Asset management based on the Internet of Things technology is an inevitable trend of future development. The scheme proposed in this paper can greatly improve the management effect of fixed assets, and at the same time realize the effective control of various costs, prompt enterprises to reduce operating costs, and effectively avoid problems such as excessive repeated purchases and excessive inventory. In this paper, the use of IoT technology in asset process management, combined with information system management, can make fixed asset management standardized, systematic and intelligent, abandon the previous randomness, improve the efficiency and accuracy of data processing, and achieve efficient and accurate Asset management purpose [8].

Based on the concept of the Internet of Things, many industries of the Internet of Things technology have been applied, and the content to be involved is very broad, and the Internet of Things itself has a lot of room for development. The Internet of Things technologies including sensing and transmission are developing rapidly. This article mainly studies the construction of fixed asset information management based on the Internet of Things technology. This system mainly applies the RFID card label technology of the Internet of Things, discusses around the management of fixed assets, and realizes the tracking and management of the entire asset process around the fixed assets with the help of RFID information media. And by scanning the RFID card on the fixed asset with the scanning terminal handheld to input the asset information, it can greatly improve the working speed of the interaction between the asset and the system. In addition, it can ensure that the data flow of related asset management is highly matched and consistent with fixed assets, so that fixed asset management can be systematic, standardized, and networked. Real-time networked management of fixed assets throughout the entire process, efficient and systematic management of fixed asset data, standardized management procedures, and further improved management efficiency [9,10].

In each pass of the asset information change, the asset information is updated through the Internet of Things RFID technology, and the non-contact tag information on the asset is interacted and transmitted with the information in the asset management system to achieve the full life cycle of the asset information Management. System management flow chart shown in Figure 1.

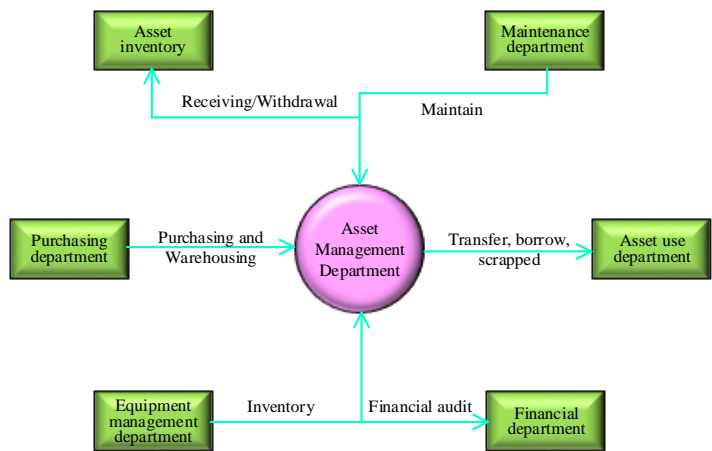


Figure 1: System management flow chart.

2 ASSET MANAGEMENT SYSTEM DESIGN

On the whole, the concept of system design is to use the Internet of Things technology to transfer fixed asset data to the database and implement corresponding asset management and control activities. Because of the role of various objective elements, fixed assets will more or less change,

such as increase or decrease, so it should be ensured that the corresponding authorization is obtained before input. In order to effectively integrate various businesses in asset management, the symmetry of information should be ensured, that is, the use of information sharing in the database to implement the design and operation of the authorization of operating credentials.

After that, the best solution is obtained through screening, that is, the asset management method, and the corresponding operations are implemented according to the accounting operation voucher authorization standard. The composed operation record is the so-called bookkeeping voucher. Finally, by outputting various reports in the asset management database, the fixed asset database can be searched and analyzed. The system design focuses on the following modules: asset operation, asset file management, asset data interface and asset report management, asset change management, basic setting management, etc. The architecture of the asset management system designed in this paper adopts the client/server (C/S) model. The main function of C/S is to share transaction logic tasks to the greatest extent, reducing the workload of client computers. The corresponding advantage is that the client feedback speed is fast.

The user can directly enter and log in to the client to achieve the purpose of accessing the back-end server, and then achieve the required operations. The more prominent feature of asset management is that it is not centralized. At the same time, it may not be an institution in the use of asset management. Choosing C/S can fundamentally reduce the company's management investment. Each institution can implement assets through simple configuration. Manage system operations and find related behaviors, and users don't need to sort out addresses and other information to directly access them, as shown in Figure 2 below.

Figure 2 shows that each unit participating in the asset management process can access the asset management system based on the Internet of Things through the Internet, local area network or wireless network, and then carry out related operations on different matters, such as finding the required statistical data, you can directly Obtain relevant information through the asset management system. RFID technology and middleware are used for information acquisition, replacing the previous bar code technology. Therefore, it is possible to achieve the intelligent collection of asset information and dynamic supervision of the management process.

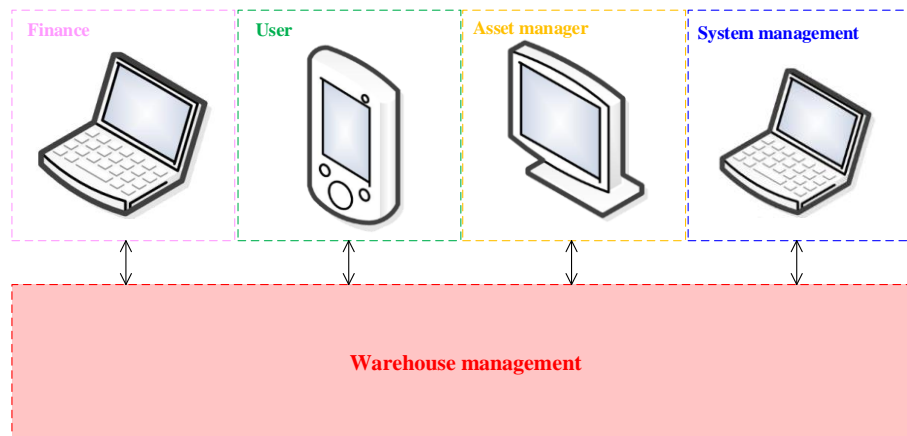


Figure 2: System overall business architecture diagram.

In terms of hardware, the management system based on the Internet of Things mainly includes the following items: the main control system, the reader and the handheld unit. The main control system mainly includes the main control computer, network controller, reader, etc. The main computer and the network control equipment are connected to each other, and at the same time, the data line is

used to communicate with the wireless network equipment, the reader and the identification antenna. The read-write and handheld units mainly include wireless network connectors, RFID tags, identifiers, identification antennas, and handheld devices.

The software architecture design is shown in Figure 3. The asset management system based on the Internet of Things mainly includes the following elements: asset claim, change, asset retirement, maintenance, and inventory. Use IoT devices and networks to transmit different asset data to the database of the asset management system, or the system can directly obtain relevant data in the asset database. The functional modules of each system can directly operate and transmit asset data with the help of RFID tags.

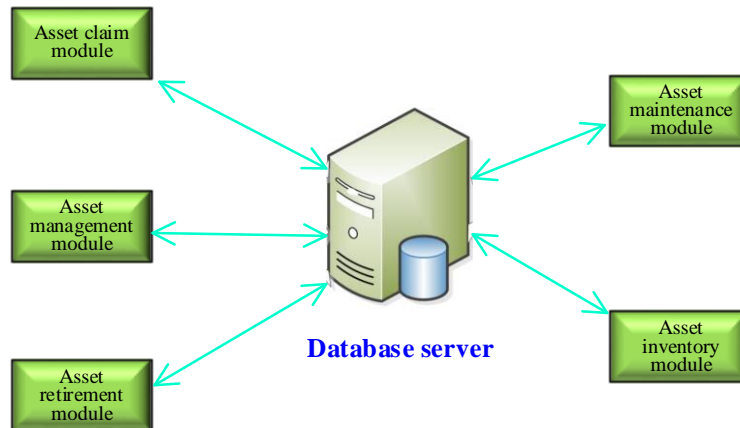


Figure 3: Software architecture of an asset management system based on the Internet of Things.

For this management system, basic setting management is indispensable. At the same time, the goal of this behavior is to unify the division of part of the managed data. Because in the link of fixed asset management, there is a close relationship with most asset information. Therefore, it is necessary to carry out effective basic setting operations on the above-mentioned data. Settings management includes multiple levels, such as data settings such as coding, operation permissions, and units. Coding settings belong to a type of settings for the company's fixed assets to be deployed through codes; operating authority settings are a type of management settings for actors; process settings are a type of management settings for enterprises to carry out asset management processes; department settings are aimed at goals Set up the department of the enterprise unit. The asset management system based on the Internet of Things technology uses high-frequency RFID sensor acquisition technology to process corporate assets informatization, achieving informatization, technology, and intelligent management of corporate fixed assets. After the design and demand analysis of the above chapters, this chapter mainly discusses the development of an automated asset management system based on the Internet of Things technology. The specific plan includes hardware implementation (omitted due to space limitations) and software development. Based on the enterprise's own information system, use its own information and network technology, including sensor technology combined with a private network to build a demonstration application project of the Internet of Things, and perceive the enterprise's information assets. Closely connected with practical needs, the technology is combined with practical applications in a targeted manner to complete the monitoring and management of the asset's environment and status. The method is adopted to realize the management of the system, which is convenient for the administrator to operate. The main functional modules are asset registration, asset warehousing, asset physical management, asset disposal management, asset inventory management, asset inspection,

handhelds, and regional monitoring. The asset management system is mainly composed of four basic contents. Asset change management is an indispensable step in enterprise fixed asset management. For this step, what needs to be dealt with is the increase or reduction of asset disposal and other types of treatment, that is, various effective ways to deal with the adjustment of fixed assets to deal with these changes.

The treatment of the increase in fixed assets belongs to the treatment of the increase in the company's fixed assets. Because the company will inevitably purchase and increase fixed assets to a certain extent during the development stage, effective countermeasures should be taken in the system design to target the company. When the fixed assets are added to the implementation of management, it should be expanded to add corresponding functions to the fixed assets, such as adding assets to the warehouse, modifying and auditing operations. Moreover, the preparation of reports for the increase in fixed assets should be carried out based on the classification of facilities and equipment management, and the delivery of facilities and equipment must be reviewed and approved by the relevant designated agencies before they can be obtained. It is the basic function to expand and correct the wrong information in the preparation of the storage list. In the process of implementing corrections, the first step is to record the operation steps, which can be traced back to the correction record, and the second is to carry out corrections, deletes, and other operations for the documents. But the corrective action should be based on the same subject as the operation and the writing of the information. At the same time, there is also an audit list function, which is mainly responsible for conducting audit operations on the compiled and revised information. In the audit link, if the audit initiator is accurate, the audit pass function can be selected, and the system will automatically enter the auditor's information and use it to show who the information of the increase order has been audited. The audit has already been approved. . The audit increase order also has a specific basis, that is, the actors can be different subjects.

Treatment of scrap or reduction of fixed assets. This is a type of processing function developed for the reduction of fixed assets due to objective factors. The company's reduction of fixed assets is closely related to other aspects of the processing in the response link, and the relationship can be found in the process of asset reduction. Regardless of the mode or composition, the reduction and increase of fixed assets are handled basically in the same way. The processing method for reduction is mainly manifested in the following levels: the function of preparing, modifying and reviewing reduction orders. First, in terms of establishment, the number of reductions depends on the relevant facility management agency. It is not independently established and should have an effective basis. During the compilation process, if you see wrong data, that is, there is wrong data in the input process, you should correct or delete it by means of correction. The first is to find the revised records, and then implement changes, deletions and other actions. The basis is also that the corrective actions should be based on the same subject as the operation and writing of the information. Second, for auditing, it is mainly to conduct retrieval and auditing of the originally entered processing order data, which should be audited one by one to avoid omissions. If the data processed by the audit is correct, you should click through the module. At this time, the system will automatically enter the reviewer's information, and in this way, the data on the reduction of fixed assets will be displayed through which person is operating. For the audit, the data of its operation will be autonomously input into the database through the system. In addition, the requirement of this operation is to ensure that the operator and the preparation operator are not the same subject.

Adjustment of the value of fixed assets. Regarding fixed assets, the management of occupation is a crucial operation. The reason is that in the company's operations, due to various objective factors such as prices, the value of fixed assets will change. At this time, appropriate operations should be carried out. Regulation and processing. The focus of fixed assets adjustment processing includes the following levels: fixed asset life adjustment, value enhancement, net residual value adjustment, changes in utilization, depreciation adjustment, etc.

Depreciation or scrapping of fixed assets. The reason for this operation is that the fixed assets have changed. In most cases, the depreciation operation is carried out based on the data of the

fixed asset files. Therefore, before implementing the depreciation operation, the method of screening depreciation provision should be designed in advance based on the accounting vouchers, and then the depreciation configuration table should be developed and compiled. Under normal circumstances, depreciation should be completed in a short period of time, as far as possible in the current period, because the increase in fixed assets does not require depreciation, but its reduction needs to start this operation. At the same time, the focus is to calculate depreciation based on the files of fixed assets, forming a depreciation allocation table. Moreover, after obtaining this table, the efficiency of information transmission can be improved. In the system processing link, the information should be transmitted to the subsystem. And this table is related to partial depreciation expressions, which can be designed using the system based on the accounting and financial system. At the same time, even if the depreciation allocation table is formed autonomously by the system to some extent, it cannot be changed manually.

Fixed asset file management. This operation contains a lot of content, which can be said to run through all areas of fixed assets. The data of the increase and decrease orders of fixed assets will be made into files and summary tables. This is an indispensable step for file management, which includes the following levels, which are the functions of compiling and querying files, and compiling and querying summary tables. The reason is that the archive management includes the following two important information, namely archives and summary tables. Before the implementation of the preparation of the archives, the preliminary work that should be prepared is the depreciation operation, and then, with the help of the system to independently form the archives. In order to remind, usually before writing, the system will send the user to ask whether the depreciation operation has already been carried out. For archives, there is a small amount of information that can be changed by users, but most of the information can only provide query services, and cannot be changed manually. At the same time, there is a close relationship between the generation of the summary table and the archives. The archives are divided into types according to departments and then obtained through aggregation. The reason for making the summary table is to facilitate an in-depth understanding of the details of the fixed assets of different institutions. After the production is completed, the query operation can be performed, but the modification operation cannot be implemented manually. The corresponding results are shown in Figure 4, Figure 5 and Figure 6.

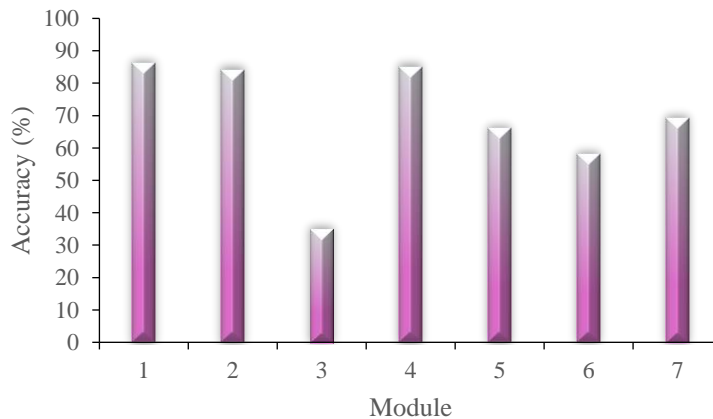


Figure 4: Correct rate before optimization.

Asset information interface and report processing. For system design, because it is related to data entry, output and management, the overall data of the system should be standardized. This includes the following functions: basic card management data entry, data Import and export and report generation functions. In the meantime, the first function should be operated manually. This is because there are some more important data that are not allowed to make mistakes, and must be

verified and verified manually, such as the number of years. All of the above information can be used for verification operations, and related data reports can be used for verification. In the system, in order to facilitate the docking with humans, a professional module has been created. This module can independently transport the collected information to the system. However, because fixed assets and data have a chance to produce certain changes, a sub-module should also be used to collect the changed information. In order to facilitate information processing, specific settings have been made for the import and export of data in the system. Because of the role of accounting statements, vouchers, information changes, etc., in the link of data interface and management, the list of changes related to fixed assets should be sent to the database. At the same time, the output of information should be expanded. Usually, the output is the information necessary for the accounting statement vouchers. The report formation can provide the system with a variety of accurate reports, which will be formed according to various depreciation treatments in the future processing.

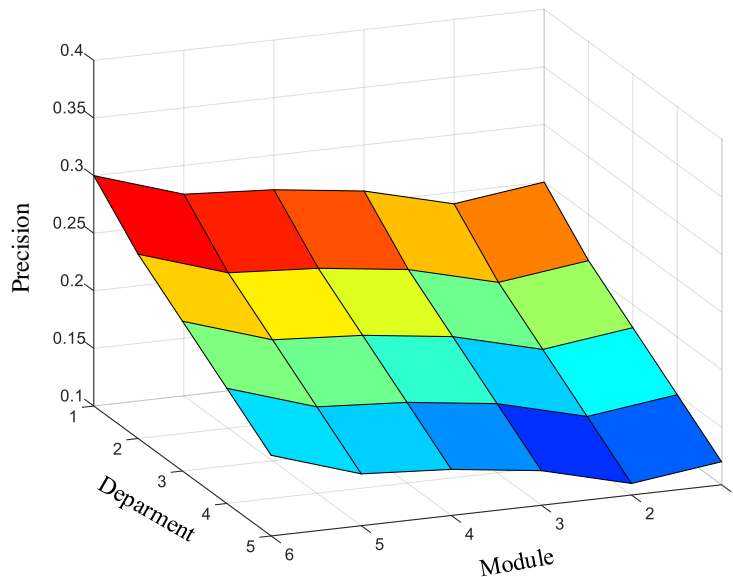


Figure 5: Precision before/after optimization.

Period-end settlement processing of fixed assets. This operation can be interpreted as a summary operation for the fixed assets of various companies before the end of the accounting period. Such a goal is to facilitate management and facilitate the smooth progress of the next accounting period. In a certain period of time, the various types of consumption generated and the closing operations through the profit status can be used to study and recognize the various conditions of the company's operations during this period, including the following two levels: First, the fixed asset change order function; Second, the transfer voucher function. The first is to summarize the changes in the current period; and the second function is to show the changes in the form of transfer vouchers, and then implement financial processing operations.

3 ASSET MANAGEMENT SYSTEM IMPLEMENTATION

This part describes the realization of the asset management system. This software mainly realizes the information management of the storage and lending of the fixed assets of the enterprise. For fixed assets, carry out storage and secondment registration, and use high-frequency RFID functions for valuable assets to monitor valuable assets in the area to prevent the loss of valuable assets, so

as to manage the company's fixed assets more standardized, more reasonable and effective, and improve The informatization level of the enterprise's asset management.

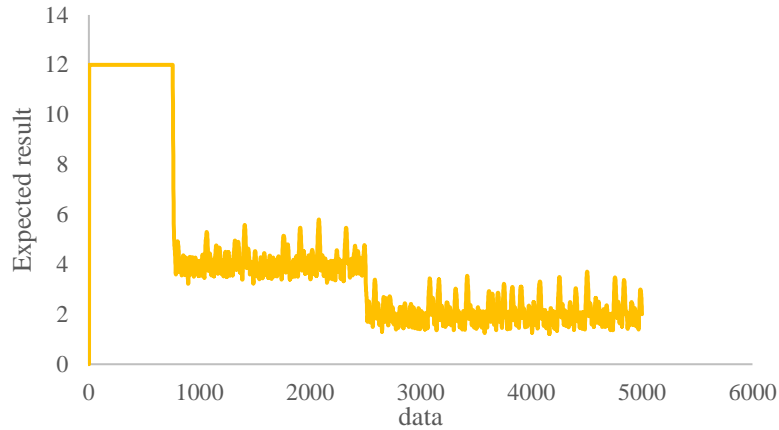


Figure 6: Expected result

Therefore, considering the complexity of programming and the operability of the software, in terms of software design, this design uses the VS2014 platform and SQL SERVER 2008 database to develop an asset management software system. It also explains how to implement and test the information system of this department. The correct rate after optimization is shown in Figure 7.

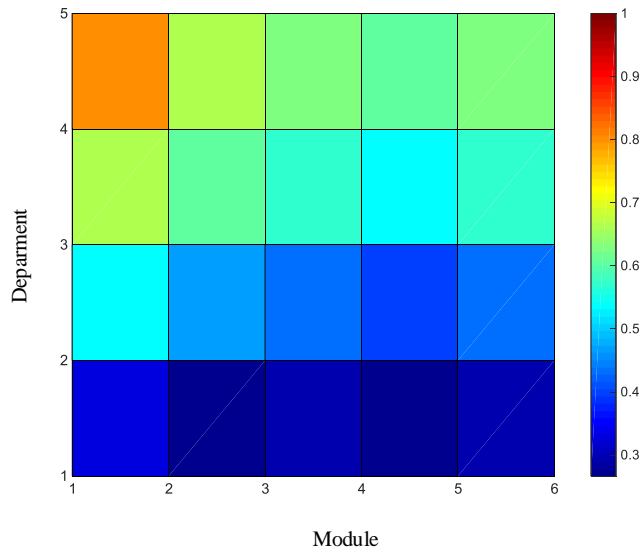


Figure 7: Correct rate after optimization.

The asset management system based on the Internet of Things technology uses high-frequency RFID sensor acquisition technology to process corporate assets informatization, achieving informatization, technology, and intelligent management of corporate fixed assets. After the above design and demand analysis, this chapter mainly discusses the development of an automated asset management system based on the Internet of Things technology. The specific plan includes hardware implementation (omitted due to space limitations) and software development. Based on the

enterprise's own information system, use its own information and network technology, including sensor technology combined with a private network to build a demonstration application project of the Internet of Things, and perceive the enterprise's information assets. Closely connected with practical needs, the technology is combined with practical applications in a targeted manner to complete the monitoring and management of the asset's environment and status. The method is adopted to realize the management of the system, which is convenient for the administrator to operate. The main functional modules implemented include asset registration, asset warehousing, asset physical management, asset disposal management, asset inventory management, asset inspection, handhelds, and regional monitoring. The specific effects are shown in Figure8 and Figure 9.

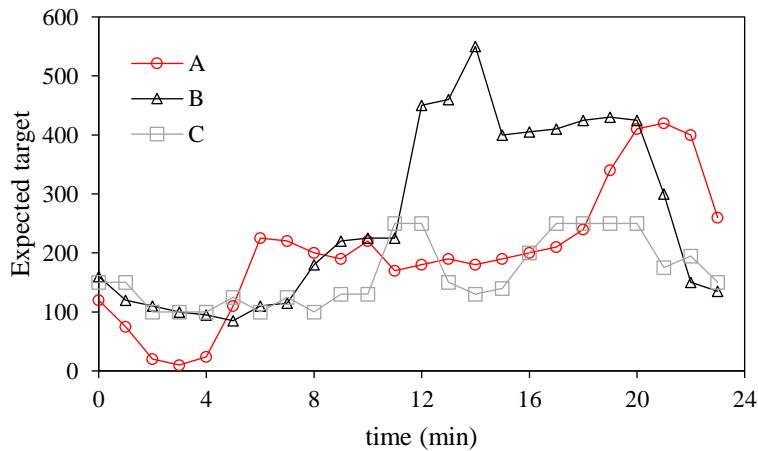


Figure 8: Expected value.

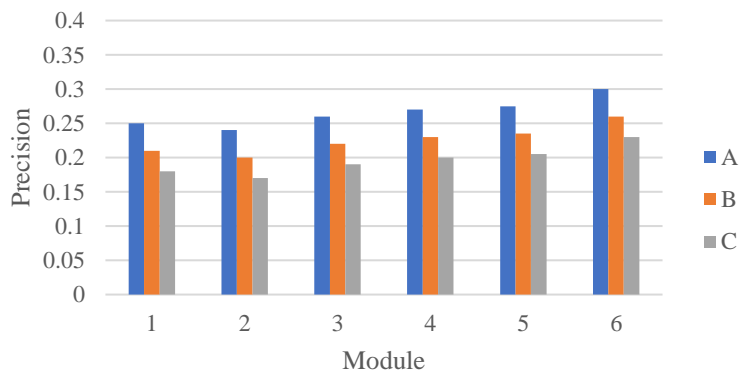


Figure 9: Precision in different examples.

4 CONCLUSION

This article mainly uses the Internet of Things RFID technology to establish a fixed asset management platform based on the Internet of Things technology. First, the fixed asset information is quickly exchanged with the asset management information platform to achieve the purpose of efficient asset management; secondly, the use of the Internet of Things COSCO's identification technology establishes the asset area management function, and installs identifiers in the access

channels of assets. When fixed assets pass illegally and enter or leave the specified range, the system can automatically issue an alarm. This function can effectively protect the valuable assets of the enterprise. This article mainly studies the architecture design and detailed system design of the asset management system based on the Internet of Things technology, and implements the development of the enterprise fixed asset management system based on the Internet of Things technology, combining the Internet of Things technology and adopting the corresponding information system to achieve The company's fixed assets are recorded and the assets are monitored throughout their entire life cycle to achieve reasonable and efficient use and deployment of fixed assets, optimize and simplify the asset management process, and ensure the reliability and integrity of asset data; Economic and social benefits.

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