Based on Analysis and Design of Fixed Asset Management System for Electric Power Enterprises Based on NET

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Abstract. Fixed asset management is a part of enterprise management and the foundation of enterprise management. In recent years, with the rapid development of the national economy, the quantity, variety, and value of fixed assets in power enterprises have grown rapidly. The quality of fixed asset management directly affects the operation and development of enterprises, and the complexity and dispersion of fixed assets in power enterprises make fixed asset management more challenging. In the past, power companies pursued a large and comprehensive approach to fixed asset management, while a small and comprehensive approach emphasized investment and resource allocation. Traditional manual accounting methods were still used for fixed asset accounting, resulting in a disconnect between investment and operation. The lack of strong means of revitalizing the existing assets of the enterprise was overlooked due to the outdated management methods. On the one hand, the stock assets of enterprises are increasing day by day, and on the other hand, there is a situation where idle and insufficient assets coexist, resulting in investment shortages and the solidification of stock assets. This has led to significant cost pressures, resource waste, and decreasing profits year by year. The establishment of a powerful fixed asset management system by electric power enterprises through the use of information technology is of great significance for standardizing, institutionalizing, scientific, and information-based management of fixed assets, in order to improve their utilization rate, integrity rate, and maximize their benefits.

Keywords: Electric power enterprises, Fixed assets, Comprehensive management, system development

1 Introduction

For a long time, fixed asset management has been a weak link in the management of power enterprises due to outdated management methods and extensive management methods. Therefore, strengthening the management of fixed assets in power enterprises is of great significanc[1-3]. The establishment of a powerful fixed asset management system by electric power enterprises through the use of information technology is of great significance for standardizing, institutionalizing, scientific, and information-based management of fixed assets,

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in order to improve their utilization rate, integrity rate, and maximize their benefits. Firstly, the development of a fixed asset management information system focuses on integrating physical and financial systems to achieve consistency between accounts and cards, achieving data sharing and information synchronization. Secondly, the focus is on meeting the needs of physical and financial management, using computer network technology as a carrier to optimize business processes, reduce business overlap and data duplication, and achieve high efficiency, no loss, integration, and informatization. Provide a comprehensive and systematic advanced management platform for enterprise data statistical analysis, real-time decision-making, dynamic control, and quantitative evaluation. Realize the integration of physical and financial fixed asset computer management and information networking, so as to adapt fixed asset management to the operational needs of modern power enterprises[4-6].

The main countermeasures for revitalizing the fixed assets of large enterprises are emphasized in several aspects, such as expanding channels for revitalizing idle assets, formulating and improving reward methods for revitalizing idle assets, scrapping and eliminating some idle fixed assets. In his article "Analysis and Research on the International Competitiveness of Large Chinese Companies", Li Junfa compared the international competitiveness of large Chinese companies with foreign multinational corporations in terms of resource ownership, production scale, assets and structure, capital composition, profitability, marketing ability, risk resistance, international production and operation, and research and development ability. Li Yushuang and Liu Xuechao pointed out in their article "The Management and Application of Accounting Computerization in Fixed Asset Accounting" that many enterprises have been lagging behind in using traditional manual accounting methods for fixed asset accounting[7-8].

In recent years, the West has proposed quality management theory for fixed asset management and has achieved significant achievements. Motorola and General Motors were the first to adopt Six Sigma's quality management program, which not only greatly reduced costs but also made the previously chaotic fixed asset management program clearer and more concise. Western investment theory experts also attach great importance to the study of the relationship between economic growth and fixed capital investment. Investment theory includes the Harold Thomas model[9-10]. It is a growth model based on Keynesian economic theory The basic formula is the economic growth rate, savings rate, capital output, or economic growth rate, incremental national output, early national output, investment rate, and early national output. There are also new classical economic growth models and new Cambridge economic growth models in investment theory. The neoclassical economic growth model emphasizes that economic growth is not only driven by capital investment, but also by all factors including labor and technological progress. The New Cambridge Theory emphasizes that the savings rate is a variable. Andersen, one of the world's top five accounting firms, has studied leading companies with outstanding performance in fixed asset management. Andersen integrates the knowledge of experts, consultants, and industry leaders to promote and implement the concept of fixed asset management. Many experts and institutions abroad have conducted extensive and in-depth research on fixed asset management[11-13].

This article analyzes the current situation and prominent problems of fixed asset management in power enterprises, and explores the ideas and methods for establishing a comprehensive management information system for fixed assets in power enterprises. On the basis of a detailed analysis of the business requirements for fixed asset management in power enterprises, this paper uses application development tools to design and develop a software system that

integrates fixed asset system management, data management, institutional management, statistical analysis, query and printing functions. This system has achieved standardized, modern, and information-based management of fixed assets in power enterprises, improving the quality and efficiency of fixed asset management in power enterprises.

2 Basic knowledge of fixed assets

2.1 The concept of fixed assets

Fixed assets refer to labor materials that are available for long-term use, have high value, and do not change their original physical form during production, commodity circulation, and service processes. Fixed assets must meet the following conditions simultaneously: held for the production of goods, provision of services, rental or business management, with a service life of more than one year and a high unit value. The new accounting standards have abolished the previous restrictive provisions on the unit value of fixed assets of 2000 yuan. In practical application, enterprises can determine the value judgment standards based on the nature and consumption methods of different fixed assets, combined with the characteristics of their own business management.

2.2 Classification of fixed assets

In order to strengthen the management of fixed assets and organize the accounting of fixed assets correctly, it is necessary to scientifically classify fixed assets. This is a necessary foundation for the accounting and management of fixed assets. According to the current accounting system for industrial enterprises, they are divided into seven categories: fixed assets for production, fixed assets for non production, leased fixed assets, unused fixed assets, fixed assets that do not need to be used, and fixed assets for land and financing leases.

(1) Fixed assets for production and operation. Refers to various fixed assets that directly serve the production and operation processes of enterprises. Including houses, buildings, machines, appliances, tools, etc. used for production and operation.

(2) Non production and operation fixed assets. Refers to various fixed assets that do not directly serve the production and operation processes of enterprises. Buildings, equipment, and other fixed assets used in employee dormitories, canteens, bathrooms, etc.

(3) Leasing out fixed assets. Refers to fixed assets leased to external units for use in accordance with regulations.

(4) Fixed assets that do not require use. Refers to fixed assets that the enterprise does not need to use and are prepared for disposal with the approval of higher authorities.

(5) Unused fixed assets. Refers to newly added fixed assets that have not yet been used and transferred to fixed assets that are yet to be installed for renovation or expansion, as well as fixed assets that have been approved for cessation of use.

Other classification methods for fixed assets include:

(1) Classified by economic use. Divide all fixed assets into two categories: production fixed assets and non production fixed assets. Mainly used to grasp and analyze the proportion and

changes of the two major types of fixed assets, to promote enterprises to reasonably equip and fully utilize existing fixed assets.

(2) Classify according to usage. Divide all fixed assets into four categories: in use fixed assets, leased fixed assets, unused fixed assets, and unused fixed assets. Mainly used to grasp the usage of all fixed assets and encourage enterprises to take measures to maximize the efficiency and utilization of unused and unnecessary fixed assets.

(3) Classified by property ownership relationship. Divide fixed assets into two categories: self owned fixed assets and leased fixed assets. Leased fixed assets can be divided into two types based on their leasing method: operating leased fixed assets and financing leased fixed assets. For enterprises that lease fixed assets for operation, they only have the right to use them without ownership. After the lease term expires, they generally need to return them to the lessor, so these fixed assets cannot be recorded in the enterprise's fixed asset account book, However, only a temporary registration can be set up for fixed assets under operating leases. For fixed assets under financing leases, half of their ownership will belong to the enterprise after the expiration of the lease term. This leasing method has actually transferred the risks and rewards related to the ownership of the asset retained by the lessor to the lessee. Therefore, during the lease term, they should be accounted for and managed as if they were the enterprise's own fixed assets. Dividing fixed assets according to their ownership is beneficial for clarifying their ownership.

Some calculation formulas used by power companies in fixed asset management. These formulas can help power companies better manage their fixed assets, improve asset utilization efficiency, and reduce maintenance costs. The following are some commonly used fixed asset management formulas for power companies:

$$X^* * (1 - Y^*)/Z^* = R^* \tag{1}$$

Formula 1 is the fixed asset depreciation formula, where X^* is the original value of the fixed asset, Y^* is the estimated net residual value rate, Z^* is the estimated useful life, and R^* is the annual depreciation amount.

$$X^* - L - T = V \tag{2}$$

Formula 2 is the fixed asset net value formula, where L is cumulative depreciation, T is impairment provision, and V is the fixed asset net value.

$$R^*/A^* * 100\% = S \tag{3}$$

Formula 3: Fixed asset utilization rate formula, where R^* is the actual usage area, A^* is the total area, and S is the fixed asset utilization rate.

$$W^*/(A + 1) = S^* \tag{4}$$

Formula 4 is the fixed asset maintenance cost formula, where W^* is the total maintenance cost, A is the number of repairs, and S^* is the cost of each repair.

3 Design of fixed asset management system for electric power enterprises

System design, also known as system logic design. The task of this stage is based on the system analysis of the previous stage Further clarify how the new system meets the requirements of the management system. System design should consider the flexibility, reliability, and economy of the system. After system analysis, the logical model of the system has been obtained, and a deep understanding of the system has been gained, clarifying the issue of what the system does. In the system design phase, it is important to focus on solving the "how to" problem. By adopting a structured system design method, the logical model of the system is transformed into the information structure or database physical mode and software structure of the system, and the input and output formats of each software module are designed to form a system design manual or document, which serves as the direct basis for programming during the system implementation phase.

3.1 Overall design

The process of functional decomposition is a process from abstract to concrete. A functional structure diagram is a chart drawn based on functional dependencies, and each box in the diagram is called a functional module. The design concept of the functional structure diagram of this system is to initialize the original fixed asset increase/decrease change vouchers and input them into the fixed asset database. According to accounting standards, appropriate depreciation methods are selected to calculate the depreciation amount, the utilization efficiency of fixed assets, and the accounting vouchers are synthesized. A standardized report is output to query and analyze fixed assets. The functional structure diagram of this system is shown in figure 1. This system mainly includes 5 functional modules.

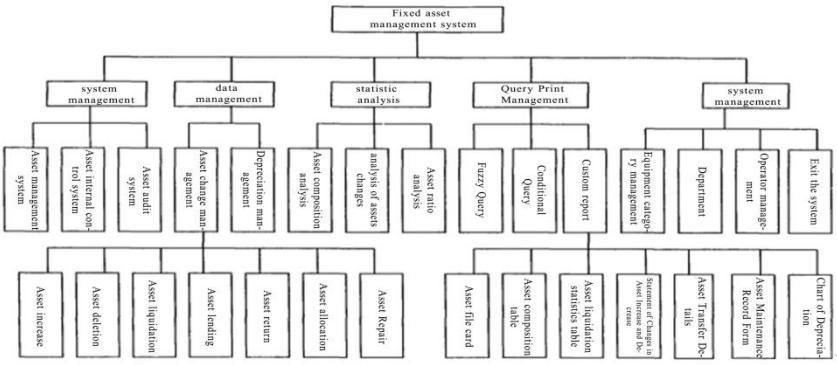

Fig. 1. Overall structure diagram.

(1) System management module. Provide management of equipment categories in the fixed asset management system, including personnel management and basic company information management, adding, deleting, and modifying functions, and outputting various comprehensive information of fixed assets.

(2) Data management module. This module is used for data operators to manage and query information related to fixed asset equipment, including asset change management and depreciation management. Asset change management includes the addition, deletion, cleaning, lending, return, allocation, and maintenance of assets.

"Asset Increase" is used by data operators to add new fixed assets, including asset number, asset model, asset name, type, department, purchase price, depreciation price, and purchase date.

"Asset deletion" mainly refers to the deletion of existing equipment Assets that are registered incorrectly or do not require a record after exit can be deleted in this window. It should be noted that deleted assets cannot be restored again.

"Asset cleaning" is used to clean up scrapped fixed assets The added content includes asset number, asset name, cleaning date, and cleaning method.

"Borrowing and returning" mainly refers to the registration of equipment borrowed or lent by a certain department, which facilitates the display of the status of the equipment.

"Asset transfer" is used to record the transfer date and facilitate the query of the transfer in and out departments.

Asset maintenance mainly involves registering the assets that need to be repaired, recording the repair date, repair costs, etc.

(3) System management module. Provide fixed asset management system, internal control system, and audit system to facilitate supervision of asset management and serve as the basis for evaluating the effectiveness of fixed asset management.

(4) Statistical analysis module. This module includes asset composition analysis, asset change analysis, and asset ratio analysis.

Asset composition analysis is applicable to analyzing the composition of fixed assets from the perspectives of asset categories, usage departments, etc.

Asset change analysis is used to track the specific increase or decrease in fixed assets for a specified month.

"Asset utilization and effect analysis" is mainly used to analyze the utilization efficiency of fixed assets. The higher the ratio, the higher the utilization rate The better the management level. If the turnover rate of fixed assets is relatively low compared to the industry average, it indicates that the utilization rate of fixed assets by the enterprise is low, which may affect the profitability of the enterprise. It reflects the utilization level of enterprise assets through query and printing management. This module includes three sub modules: fuzzy query, conditional query, and custom report. The query module is used to query and access various data according to management needs. When the content of the fields used as query criteria cannot be accurately known, use fuzzy queries; otherwise, use conditional queries. Custom reports are mainly used for outputting and printing various reports.

To verify the effectiveness and feasibility of the system, we conducted a series of experiments. The experimental results are shown in table 1:

Table 1. Asset Category Table.

Number	Experimental steps	Observing phenomena	Data record
1	User login	The user is able to successfully log in	Success
2	Asset Information Management	Information can be successfully added	Success
3	Asset acquisition management	The claim information can be successfully added	Success
4	Asset scrapping management	Scrap information can be successfully added	Success
5	Asset maintenance management	Repair information can be successfully added	Success

Logic functional testing is used to test the logic of a system, mainly targeting the business logic and operational logic of the system. The operation logic check mainly includes: page link check, relevance check, checking whether the function of the button is correct, information duplication, checking deletion function, etc. Taking system login testing as an example, as shown in table 2, describe the functional testing process of this system.

Table 2. Functional testing.

ID	20110607004	Name	System Login
Use case description	System login Enter the system with a valid username and password Page information includes: Page background display User name and password input interface, login system interface after inputting data		
Use case entry	Open IE and enter the corresponding address in the address bar to enter the login page of the system		
Test Case ID	Scene	Testing procedure	Expected results
TC1	Initial page display	Enter from the entrance of the use case	Design consistency
TC2	User name input verification	Enter an existing user	Admin input successful
TC3	Password entry	Enter data associated with username	Input successful
TC4	System login	Click the login button	Successfully logged into the system

The above test results show that the stability of this system can effectively manage power asset management.

4 Conclusion

This system implements functions such as asset increase, change, scrapping, damage, depreciation, allocation of departments for use, changes in departments for use, setting of management personnel, asset exchange between departments, printing of various reports, and combination queries. For each fixed asset, detailed records can be kept of all information

related to its purchase, entry into account, use, department of use, and release for use. The dynamic query function can ensure that management personnel have comprehensive information and materials at the first time. Automatic report preparation and printing are fast and accurate, saving a lot of manual report preparation time. The system consolidates previously dispersed management information and combines it into an information platform with overall fixed asset management capabilities.

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