

Analysis on the Integrated Accounting System of Enterprise Accounting and Statistics in the Big Data Era

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Abstract. In recent years, our country's comprehensive national strength has been continuously enhanced, the market economy system has been continuously improved, and the development of each industry has also undergone certain changes. The increasingly vigorous development of society and the increasingly fierce market competition are both opportunities and challenges for enterprises. If an enterprise wants to get better development, it is necessary to strengthen the management of its financial work. The current establishment of an integrated system of accounting and statistics is a good idea to improve the efficiency of corporate financial management and promote corporate development. Therefore, this article aims to study the integrated accounting system of enterprise accounting and statistics in the era of big data, and make full use of it on the basis of analyzing the status quo of our country's economic information system, the reasons for this status, and the integration of accounting and statistic accounting. The advantages of big data technology have built a new economic information production system based on big data, organically combined accounting and statistical accounting, and tested the functions of the system. The test results show that, the functional test finally found no bugs, and the performance meets the current needs of users and choices.

Keywords: Big Data, Accounting, Statistical Accounting, Integration.

1 Introduction

With the development of the market economy, accounting has developed from recording, measuring and reporting the results of economic activities to controlling and supervising the entire process of business activities, participating in business decision-making and long-term decision-making, and making contributions to macroeconomic management, and national regulations provide important information [1-2]. The characteristics and calculation characteristics of the statistical period and time point indicators with respect to numbers provide a theoretical basis for the difference between accounting stock accounting and flow accounting [3-4].

In recent years, in the operation and management of enterprises, they have gradually and rationally used the combination of accounting and statistics to perform financial accounting. This method can systematically, completely and uniformly grasp various quantitative relationships in economic operations. It is not only the core of the

macroeconomic system, but also the basis for enterprises to achieve scientific management and decision-making [5-6].

Based on the analysis of the status quo of our country's economic information system, the reasons for this status, and the role of the integration of accounting and statistical accounting, this paper makes full use of the advantages of big data technology to build a new economic information production system based on big data. The accounting and statistical accounting are organically combined, and the function of the system is tested.

2. Analysis of the integrated accounting system of corporate accounting and statistics in the era of big data

2.1 The status quo of our country's economic information system

(1) The degree of information sharing is low. Information exchange between departments, departments and social stakeholders is even more difficult than during manual accounting. It not only wastes manpower and equipment, but also increases the amount of data, and the error rate reduces the timeliness of the use of accounting and statistical information, and its impact is much deeper than on the surface [7-8].

(2) The basic work of economic information is weak, causing information distortion and backwardness. Under the planned economy system, enterprises and grassroots organizations lacked strong demand for information, lacked the enthusiasm to collect and store their own and macroeconomic information, regarded the reporting of various reports as an additional burden, and lacked a sense of responsibility, benefit mechanisms, and legal obligations. Related to this, the manpower invested in information work is relatively weak and unstable, and the methods are relatively backward, making it difficult to accurately collect and transmit economic information in a timely manner, resulting in distortion and backwardness of macro-information [9-10].

(3) The content and methods of economic information collection and processing: The processing methods are backward and cannot meet the requirements of socialism and market economy. At present, the collected information is difficult to reflect the price information, value indicators, benefit indicators, supply and demand information of market economic activities, and there is a big gap; in terms of collection methods, the collection of major economic information such as statistics and accounting basically depends on comprehensive arrangements. The method of reporting level by level and summarizing level by level is cumbersome and cumbersome, with a long cycle and high cost, and it is difficult to adapt to the needs of the socialist market economy; in terms of processing methods, the overall level of modernization is low, and the grassroots is still mainly manual processing. Although statistics, accounting and other comprehensive departments are equipped with some computers, the software development, remote transmission, and database construction are not matched, and they lack uniform specifications and standards, resulting in low equipment utilization, low information development, and low sharing[11-12].

(4) In terms of the management system, the national economic information management agency is weak in organization and coordination. Government statistical agencies with relatively concentrated economic and social information are also unable to coordinate accounting, business accounting, and segmented departmental statistics due to institutional constraints, causing duplication, contradictions, closures, and loss of economic information, which affects the accuracy of economic information, sensitivity, systemicity, and relatively high cost.

2.2 Reasons for this status quo

(1) Traditional accounting and statistical theory

Theory comes from practice and serves practice as well as accounting theory. Accounting assumptions are based on a specific environment to better explain the nature, functions and basic requirements of accounting. When the objective environment changes, that is, when the assumed assumptions change, the accounting assumptions should also change accordingly. With the popularization of network technology and information technology, the emergence of virtual alliances and strategic alliances between companies has broken the scope of activities undertaken by the original accounting entities: online mergers and acquisitions, bankruptcies, etc. questioning the case of continuing operations. The emergence of financial statements can happen at any time, and the assumptions of the accounting period are useless; the emergence of electronic money and electronic banking makes people dream of paperless transactions and non-monetary measurement. This series of new changes will inevitably lead to changes in traditional accounting theories, and continue to be subject to traditional accounting theories, which will inevitably produce many problems.

Most of the country's statistical information comes from the report data of enterprises and the original vouchers of business activities. The transformation of traditional accounting theory and accounting information production mode also affects the accounting content and methods of statistics; in addition, many issues such as the globalization of the economy, the global nature of the network, and the blurring of industrial boundaries also affect the content, methods, and methods of statistical accounting and other theoretical systems. Today, when network technology and information technology are so developed, the traditional statistical theory system no longer meets the needs of modernization and is not compatible with more advanced productivity.

(2) In terms of individual information production mode

According to the traditional information production model, due to the limitation of technical means and the theoretical limitation of the "accounting object", when an economic activity occurs, the enterprise as a participant can perceive the occurrence of the transaction activity and only record information. The subject matter of the transaction, while ignoring the transaction link of economic activity. In this way, the company's accounting staff confirmed the company's internal financial operations and performed a series of tasks such as preparing coupons, writing account books, summary statements, tax returns, and external reports. From the above analysis, it can be seen that the traditional accounting information production model is an individual model, and most of the statistical data of the country's macro-audit comes from corporate statements and local summary statistics. After the company completes various statistical tasks, the local management department summarizes the statistical data, and then the management department summarizes the statistical data level by level, and finally forms the national macro-audit and financial management statistical information. In fact, the traditional statistical information production method is also an individualized and mechanically concentrated production method. The National Bureau of Statistics only conducts the final collection. Too many levels of centralization and reporting in the middle provide time and space for falsifying statistical information, which makes it difficult to coordinate accounting and statistics, and to share information, resulting in many difficult problems to solve.

2.3 The effect of implementing the integration of accounting and statistical accounting

(1) It can promote healthy and sustainable business growth. At present, the enterprise

management system is gradually being improved and perfected, and the business decision-making of the enterprise will be more scientific. For a long time, financial data summarized through accounting and statistical calculations have played a reference value for corporate management. For example, when performing accounting, it is necessary to measure certain contracts, purchases and other data according to the actual operating conditions of the company. It is necessary to allocate resources rationally and to ensure that the company's financial benefits are maximized.

(2) The combination of accounting and statistical accounting can continuously improve the quality of comprehensive information. The integration of the two can reduce the workload of financial personnel and statisticians, prevent repeated transmission of information, make the accounting cycle smaller than before, further improve the efficiency of information processing, and gradually improve the level of corporate governance. Accounting and statistical accounting work covers a large amount of information about the company's financial data. The integration of the two can make financial data more accurate and timely, thereby helping business managers make correct decisions and promoting business growth.

3 Experiment

3.1 Database management system

(1) The functional structure of the database management system

The main function of the database management module is to collect, organize, store, and transmit raw data (information), manage the data of the entire system, and realize information sharing and information automation and integrated production. Once all kinds of data are truthfully input from the network terminal, the database can be established and refreshed. This means that as long as the system defines the agreed data format, structure and corresponding processing procedures, the data will be automatically based on the mode required by the system. To carry out the assembly, instead of just organizing and managing the traditional conference data as the key element. Its functional structure is shown in Figure 1:

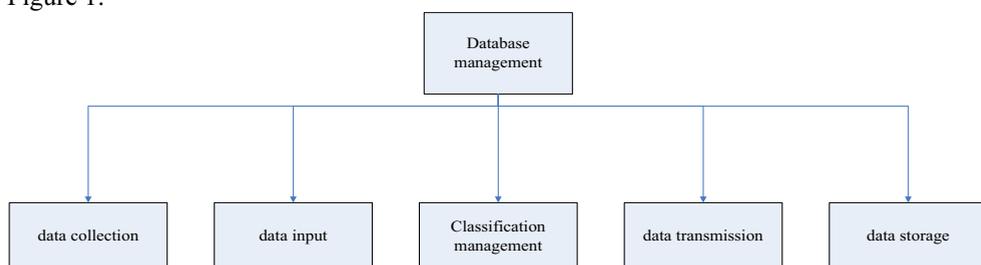


Fig. 1. Functional structure diagram of database management system.

(2) The main database

The databases used in SIPS mainly include the following categories: 1) enterprise-founded database; 2) accounting and financial database; 3) statistical information database; 4) industry contact database; 5) local transaction database; 6) remote transaction database; 7) Central transaction database; 8) GDP database; 9) Economic analysis database; 10) Input-output database; 11) Other economic data and economic analysis databases.

3.2 Economic entity establishment system

The main function of the establishment of an economic entity is to establish the establishment of an economic entity (including individuals), and allocate a certain amount of cyberspace to it, and grant certain permissions to it. A series of subsequent operations are based on its own cyberspace and data. And refresh the content in the database accordingly, and at the same time query and browse other information according to the permissions granted to the funds.

The establishment of economic entities generally includes the following contents: 1) Enterprises, including various enterprises engaged in economic activities; 2) Financial institutions, including banks, stock exchanges, etc.; 3) Government agencies at all levels, including governments at all levels from the bottom up Departments, such as the Taxation Bureau, the Statistics Bureau, the Industry and Commerce Bureau, and some other administrative agencies; 4) Intermediary agencies, including accounting firms, taxation firms, law firms, and other intermediary structures; 5) Individuals, anyone has to log in to the system, set up his own account and password, and obtain the information he needs according to his own needs.

3.3 Information system processing subsystem

(1) The functional structure of the information processing subsystem

This system is the core part of the integration of accounting and accounting. It is mainly used to process the original data of all business activities carried out by the enterprise from the establishment of economic entities to the economic activities, and perform a series of processing such as accounting and statistical accounting. All kinds of economic information needed by different departments are sent to economic information networks at all levels at the same time for all regions to collect and inquire.

(2) System description

This system mainly includes the following modules: 1) entity creation processing; 2) daily transaction accounting processing; 3) accounting information processing; 4) statistical data processing; 5) special declaration processing. The functions and roles of each module are as follows:

1) Entity creation processing. The main function of this module is that after the economic entity has successfully registered, it will establish an account and database associated with it, and perform corresponding accounting and statistical processing in its database, as follows: ① In the accounting database. The newly-built enterprise establishes accounting accounts and account books, and performs accounting initialization data processing (preparing vouchers, registering account books, financial reports); ② Establishing a statistical data processing account in the statistical information database for initial processing of statistical data. Technically, it can be carried out by establishing a sub-directory (folder); ③ At the same time, record the relevant indicators of the economic entity in the regional economic information network, such as registration place, registered capital, etc., so as to facilitate related aggregation and statistical processing.

2) Daily transaction accounting processing. The economic transaction data in the to-be-processed database needs to be processed through the daily transaction accounting function to realize the processing of the accounting data (preparing vouchers, registering account books, financial reports), and generating the accounting data of each business entity. This is the data processing work of this system Important part.

3) Accounting information processing. On the basis of the above functions, the financial reports of each operating entity are compiled regularly for inquiries and use by information users who are authorized to inquire. For example, the financial reports of listed companies

are for public inquiry and can be sent and placed on the public information network for free inquiry. The financial reports of general enterprises are only open to authorized persons.

4) Statistical data processing. The part of enterprise statistical data derived from economic transaction data is stored in the to-be-processed database, which can be used for statistical processing, so as to realize the unification and information sharing of enterprises. Other information that needs to be specially declared by the business entity can be completed through the special declaration processing module.

5) Special declaration processing. In order to deal with issues like inventory consumption of production materials, or other information that requires special declarations by business entities, consider setting up this special declaration processing module.

3.4 Economic information analysis system

The role of the economic information analysis system is first to analyze economic information. Due to the advantages of the big data environment, accounting statistics can be integrated and socialized, economic information can be shared to a greater extent, and transparency and authenticity can be increased. So it can bring out the value of economic information to a greater extent. This system mainly uses the various basic data formed before, based on data warehouse, data mining, OLAP/OLTP and other advanced technical means, to analyze the accounting information and statistical information of enterprises, regions and even countries, and calculate various indicators such as GDP, etc. In order to dig out more valuable unified information, it is also conducive to the economic decision-making and macro-control of enterprises, regions and even countries.

3.5 K-means data mining algorithm

Cluster analysis is an important part of people's daily life, and it is also applied to various fields, such as business, education, Internet, and so on. Through clustering, people can discover which things are clustered together and which things are more similar, so that things can be well summarized and concentrated, and people can dig out some valuable and meaningful information from it.

Use formulas to describe the similarity of data in interval scale variables. The most commonly used distance formulas are Euclidean distance and Manhattan distance.

The Euclidean distance formula is shown in formula (1):

$$d(i, j) = \sqrt{(x_{i1} - x_{j1})^2 + (x_{i2} - x_{j2})^2 + \dots + (x_{in} - x_{jn})^2} \quad (1)$$

The Manhattan distance formula is shown in formula (2):

$$d(i, j) = |x_{i1} - x_{j1}| + |x_{i2} - x_{j2}| + \dots + |x_{in} - x_{jn}| \quad (2)$$

4 Discussion

The whole test process of the system is iterated three times. In the iterative integrated function test phase, the total number of bugs tested is 28, 3, and 0 during the three iterations, respectively, showing a downward trend. The specific test summary of each module is shown in Table 1.

Table 1. Module bug statistics.

Test function module	Number of integrated function test bugs	Number of rectified bugs	Rectification ratio
Database management system	3	3	100%

Economic entity establishment system	4	4	100%
Information System Processing Subsystem	13	13	100%
Economic Information Analysis System	9	9	100%
Summary	29	29	

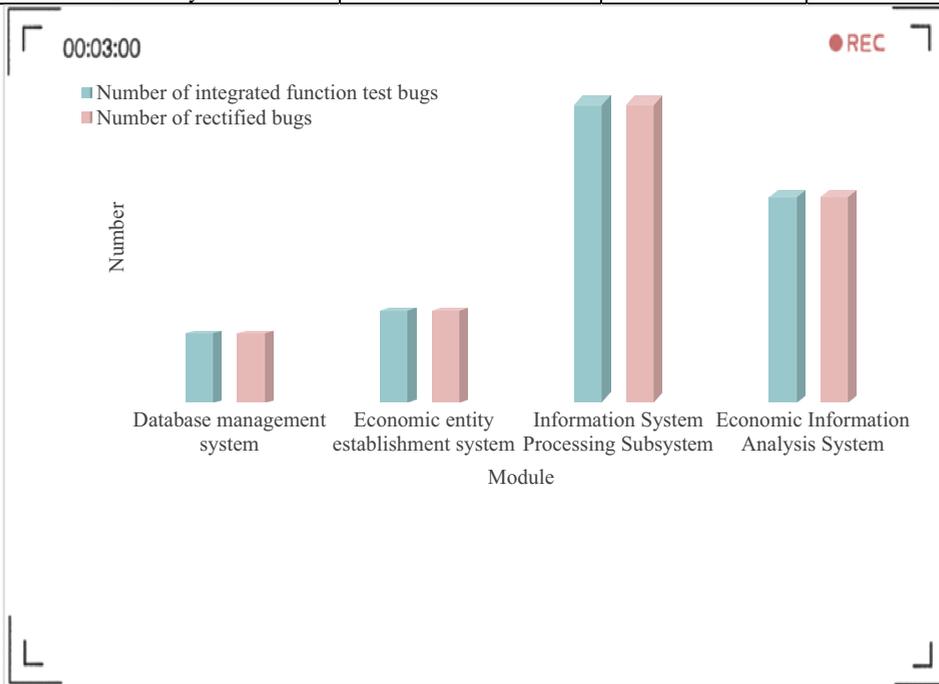


Fig.2. Module bug statistics.

As shown in Figure 2, in the testing phase, the system strictly follows the software testing process. The entire testing process is an iterative process. In the end, no bugs are found in the functional testing, and the performance meets the current user volume and selection requirements.

5 Conclusions

The continuous improvement of our country's financial system has put forward higher requirements for corporate financial management. If an enterprise wants to gain a firm foothold in the competition, it must start with financial management, innovate the financial management system, improve the integrated accounting system of accounting and statistics, and improve the quality of accounting personnel in order to maximize the financial benefits of the enterprise.

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