

On the Management of Accounting Files in Public Institutions Based on Informatization

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Abstract: In this paper, the necessity that public institutions should build a comprehensive information platform combined with other related information systems was analyzed, with the Internet+, big data, cloud computing, and other information technology as the means, internal control as the core, business information, and financial information systems as the support, to improve the management level and governance capacity of public institutions.

Keywords: Management of Accounting Files, Business Information System, Informatization

1. Introduction

In recent years, the Ministry of Finance issued a series of norms and documents, such as norms for internal control of public institutions (trial), guiding opinions on comprehensively promoting the construction of internal control of public institutions, and notice on conducting the basic evaluation of internal control of public institutions [1-2]. In the field of accounting file management of public institutions, the current industry and scholars have carried out extensive exploration [3-4]. Deng Shaoyong made a detailed analysis of the problems that need to be faced in the construction of accounting file management of administrative units and the status quo of administrative units, pointed out the problems and proposed the solutions of accounting file management of some public institutions, providing a reference for accelerating the construction process of internal control of public institutions [5-6]. Wang Huichuan tried to combine the main common risks and problems of public institutions. Chen Bin analyzed the construction ideas of accounting file management in public institutions and proposed corresponding solutions for the possible problems, to promote the quality of internal control management.

2. Accounting file information algorithm



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The maximum depth of the big data set field is set to as $N, N \leq n$. The corresponding code of the space grid finally divided is $q_1 q_2 \dots q_N, q_1 q_2 \dots q_N \in \{0, 1, \dots, 7\}$. In this way, we can use this form of coding to uniquely represent any space grid element with the smallest size. Moreover, this kind of space coding has a suitable property. For any point with known coordinates in space, we can directly find the coding of the grid where it is located. Meanwhile, if the coding of any space grid is known, the coordinates of its front left and bottom corners can be identified. For example, For a point in space $p(x, y, z)$, x, y, z are rounded up to obtain the corresponding binary representation

$$\begin{aligned} x &= i_1 i_2 \dots i_n, \\ y &= j_1 j_2 \dots j_n, \quad i_l j_l \in [0, 1], \quad l = 1, 2, \dots, n \\ z &= k_1 k_2 \dots k_n, \end{aligned} \quad (1)$$

The cube grid where p is located is encoded as $q_1 q_2 \dots q_N$,

$$q_l = i_l + 2j_l + 4k_l, \quad l = 1, 2, \dots, N \quad (2)$$

If a space grid is known to be encoded as $q_1 q_2 \dots q_N$, The coordinates of the lower left corner of the space grid are

$$\begin{aligned} x' &= i_1 i_2 \dots i_N 0 \dots 0, \quad \text{number of zeros to be filled after is } (n - N) \\ y' &= j_1 j_2 \dots j_N 0 \dots 0, \quad \text{number of zeros to be filled after is } (n - N) \\ z' &= k_1 k_2 \dots k_N 0 \dots 0, \quad \text{number of zeros to be filled after is } (n - N) \end{aligned}$$

For example, compared with direct partition, direct partition method needs six times to judge whether a point is located in a certain area; while accounting file information algorithm only requires one time for determination, which takes nearly $1/6$ of direct partition method, greatly speeding up the speed of adaptive fast algorithm. The fast and high efficiency of accounting file information algorithm comes from this.

3. Status quo and existing problems in the construction of accounting file management in public institutions

Given the status quo of the management and construction of accounting files in public institutions, the author investigated and interviewed the accounting center of a District Education Committee in Beijing. There are 190 public institutions in a District Education Committee in Beijing, including kindergartens, primary schools, and high schools. The accounting center of the District Education Committee is responsible for the accounting consulting services and accounting supervision of 190 units. According to the data obtained by the accounting center of the District Education Committee, by the end of September 2018, all 190 units affiliated to the District Education Committee had implemented financial system informatization. Among them, 162 units established the accounting file management system, 28 units that had not yet been established, and the accounting file management rate reached 85%. There are obvious differences in the application degree of accounting file management. In the 190 units, 150 launched the revenue and expenditure approval system, only 33

units have established the information system of six business modules, and 26% of the units are using internal control to establish the initial system.

The above data show that the accounting file management rate of the affiliations to the District Education Committee is still relatively high, up to 85%, but the rate of realizing the accounting file management of all six major businesses is only 17%, and the accounting file management work has a long way to go. The author also selected a kindergarten, primary school, and high school to research accounting file management. The survey showed that the application of accounting file management in various units was uneven, the breadth and depth in the application of accounting file management should be strengthened. The organization of accounting file management was not perfect. In our country, it is not usual for institutions to set up a special internal control management department, but the financial or IT department is responsible for the management. It has not only increased the workload of the financial or IT department but also makes it impossible to fulfill accounting file management professionally and effectively. The internal control activity of the unit is a system engineering led by the "First in command" and participated by all staff. It is a work that involves the relevant personnel at all levels of business, financial, IT departments, and leaders in the approval activities. In practical work, the personnel handling business and examination and approval do not take the initiative to be familiar with and adapt to the business information system with internal control as the core. When they encountered problems, they usually consult IT personnel and financial personnel for solutions or even let them handle them on their behalf, which not only brings extra workload to IT and financial personnel with heavy workload but also does not conform to the norms of internal control. According to the survey, all units have no special accounting file management department, and the financial informatization director takes the lead in carrying out accounting file management.

4. Framework of accounting file management platform in public institutions

The company should build an accounting file management platform from the perspective of building a business information system with internal control as the core. At the same time, the integration of the interface with the internal information and external information systems of the company should be considered. Finally, a full information platform with internal control as the mainline should be established. Hence, the business information system with internal control as the core should include the underlying layer, business layer, and analysis layer. The underlying layer can realize the essential functions of configuration management and support services, which is to support the management module of the business layer and the management module of the analysis layer. The business layer mainly includes six business management modules covering the corresponding internal control processes and methods, which can implement the electronic flow of budget, revenue and expenditure, purchase, contract, asset, project, and other businesses, and solidify the economic business regulations, thereby achieving information sharing and efficient coordination within the unit. The application of the business layer can be operated at both the PC and mobile end, which is convenient for business personnel to handle business quickly and efficiently. By providing various reports, the analysis layer provides relevant staff with information for statistical analysis and decision support, such as work execution progress, approval efficiency monitoring, etc.

Backstage data access, focusing on the prevention of illegal access to data and illegal tampering. The main measures are: using file database to access files to prevent file loss, illegal access and illegal

alteration; using irreversible hash algorithm (such as MD5) to encrypt and save each record of structured data, checking in relevant links (such as archiving) to prevent data from being tampered in any case. The backstage data security verification process is shown in Figure 1 as follows.

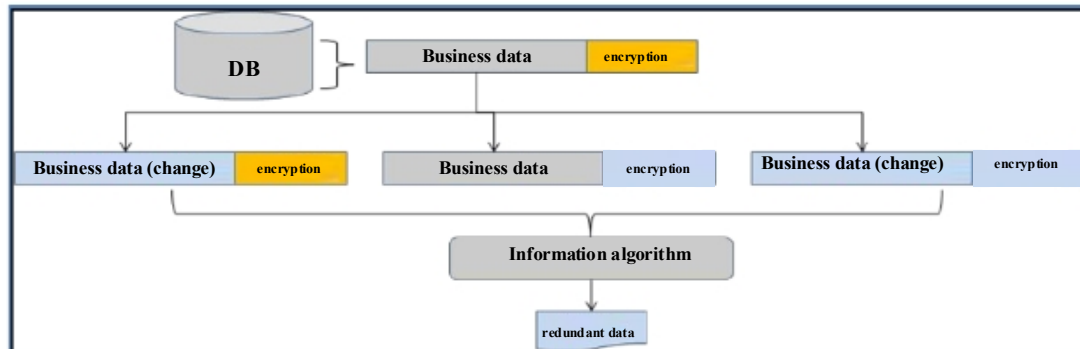


Figure1. Background data security verification diagram

5. Implementation path of accounting file management construction in public institutions

It is a systematic project that the “First in command” is in charge of the whole staff to carry out accounting file management in public institutions. The most ideal state is to be able to establish an accounting file management department, which is led by the person in charge of the unit and composed of backbone personnel such as financial department, business departments at all levels, information department, and take full responsibility for the establishment, implementation, and operation of the accounting file management of the unit. If the company's personnel are too short of establishing an internal control department, an accounting file management group led by the person in charge of the company and composed of key staff from the financial department, business departments at all levels, information departments can also be established to take charge of the accounting file management of the company.

The accounting file management department or group is responsible for the preparation, selection, implementation, and operation of accounting file management. In the preparation stage, we should fully mobilize the enthusiasm and participation of the employees and leaders at all levels, especially the leaders at all levels. Before, they seldom contacted the information system, and most of the work content was policy and decision making, which were not be involved in the specific information work. In the accounting file management, the approval control at all levels was completed by the relevant leaders, where they are not familiar with the application of the information platform and do not pay attention to it, even if it is completed by financial personnel, it will inevitably affect the efficiency of business implementation and also bring fraud risks. In the selection stage, for the specific situation of the unit, the operation status and effect of the existing information system should be fully considered to establish an accounting file management platform suitable for the actual situation of the unit. In the implementation stage, the critical work is to fully consider the advantages of information technology, optimize or even reconstruct the internal control process of the unit; in the operation stage, we should pay attention to whether the control points of each business play a control role and also pay attention to whether there is excessive control phenomenon. After the system runs for some time, the control

points in the original business process should be further sorted and optimized.

There are three ways to choose the business information system with internal control as the core, which are self-development, purchase of commercialized platform, and SaaS (software as a-service) model. It is less likely for public institutions to develop their business information system with internal control as the core, which requires strong professional developers and technical teams. It is a more common practice to purchase a commercial business information system, which has the advantages of low cost, fast implementation, and professional services. When they procure a commercialized information system, it is necessary to select a cloud application information platform with features suitable for the actual situation of the unit, and pay attention to the service capacity of the supplier. In recent years, SaaS model is relatively popular, SaaS mode is a mode of providing software services through the Internet, the unit does not need to purchase software, but only needs to rent the accounting file management platform from the supplier. It is not suitable to use this mode for units with high requirements for data security and confidentiality.

6. Conclusions

In conclusion, the management of accounting files in public institutions is a systematic project led by the "First in command". It is necessary to thoroughly investigate and integrate the status quo of the existing information systems in enterprises and fully consider the characteristics of modern information technology such as Internet+, big data, and cloud computing. A comprehensive information platform should be established with internal control as the core, supported by the business information and financial information systems, integrated with government procurement and other relevant information systems, to promote the construction of internal control of public institutions comprehensively, standardize internal economic and business activities, strengthen the restriction on the operation of internal power, and drive the continuous improvement of public service efficiency and internal governance level of institutions. The above measures aim to improve the effect and efficiency of internal control objectively by technical means, while the highest level of internal control effect and efficiency is shown in the cultural atmosphere where all institutions value and are engaged in internal control activities, all personnel involved in internal control activities have professional integrity and high sense of responsibility, honesty and trustworthiness, dedication, integrity, and self-discipline.

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