Research on the Model of Internal Control of Computerized Accounting System Based on Network Environment

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Abstract

The computerized accounting system in the network environment can confirm, measure, calculate and report the business affairs of an enterprise, so as to provide scientific reference for the enterprise to operate, manage itself, and make decisions. In this paper, we elaborate the contents of internal control of computerized accounting system, and analyze it from two aspects: general control and application control. The work flow of the computerized accounting system in the Internet environment is demonstrated, plus with some new features of the system internal control. This paper explores the internal control flow of the computerized accounting system from the perspective of network environment, and then analyzes the internal control model elements from five dimensions: accounting data security control, accounting data confidentiality control, accounting data integrity control, system internal application and maintenance control, the relationship control between internal network and external environment. The corresponding analysis process and methods are also shown in the paper.

Keywords: Network Environment, Computerized Accounting, System Internal Control, Model Analysis.

1. RESEARCH BACKGROUND AND STATUS

1.1 Research background

The accuracy and reliability of accounting information is vital to an enterprise’s operation and decision-making, especially for listed companies. Whether the disclosed accounting information is true and accurate influences the healthy operation of financial markets and the investment decision-making process of investors. Therefore, enterprises are exposed to the survival and development issue of how to effectively improve the quality of accounting information and to avoid accounting information distortion. The computerized system in China has evolved from the then embryonic stage to the present mature stage, and the great change brought by applying information technology to accounting work is widely recognized. However, due to the use of information technology, it is more difficult to implement internal control of the accounting information system. People are worried and even query about the quality of information generated in the computerized accounting system. Therefore, it is necessary to study on the internal control of computerized accounting system.

1.2 Research status

The research on the internal control of computerized accounting system has close relationship with the development of computerized accounting management software. The development of electronic technology directly promotes the formation and progress of accounting computerization. The General Electric Company calculated wages in computer in the 1950s, and computerized accounting was promoted widely in the 1970s. At present, there are over 100 American companies engaged in the commercialized accounting software development. Based on the development of American digitalized accounting software, Japan emphasize on the systematization of digitalized accounting software. Accounting software should integrate harmoniously with planning management, device management, labor management and inventory management to form a uniform system. Meanwhile, the computerized data input method is upgraded, with more emphasis on the application and development of computerized accounting management software in the network environment. At present, the understandings of accounting computerization have become complete and systematized in the Chinese academic field. Due to social and economic development and the continuously raised demands in enterprise management,
computerized accounting is on the path of popularization in China, helping in the formation of a preliminary computerized accounting management software commercialization market.

2. COMPUTERIZED ACCOUNTING INFORMATION SYSTEM INTERNAL CONTROL CONTENT

2.1 Computerized accounting information system general control

According to the content, computerized accounting system internal control can be divided into general control and application control. The core of the computerized accounting system is the electronic data processing system (EDP), and the general control is a management means of the electronic data processing system. The main contents of the general control of the computerized accounting system are: First, with organizational control, the electronic data processing departments can process data effectively and avoid the presence of error or malpractice. Second, system security control, which includes five dimensions: system environment security control, software security control, the prevention and curbing of network viruses, system internal audit, and data security control. Third, operational control, which includes computer hard drives control and written accounting data control. Fourth, file control. Operation control includes the control of the computer room management system, the operation privilege, and the operation rules and regulations. (figure 1)

2.2 Computerized accounting information system application control

The main role of computerized accounting system application control has three levels. First, it ensures the integrity of the system data input and the validity of the data modification, and enables the operational connection between the accounting practice and the computerized accounting management software. Second, the application control can ensure the accuracy of the input data and the corrected data, so that data and accounting documents can precisely correspond to each other, which guarantees the effective system implementation. Third, to ensure data maintainability in the computer auto-control. Computerized accounting system application control can be implemented in three ways according to its function, i.e. input control, processing control and output control. (figure 2).
2.2.1 Input control of computerized accounting information system

The input process transforms input data into data that the electronic data processing program can recognize and analyze. This data conversion process is the process of input control, which should not only ensure the acceptability of the input data, but also avoid the loss, repetition, addition and other distortion means of data. The input process consists of the following measures: First, establish the account comparison file and the corresponding relationship reference file. Through this measure, system data can be measured under some principles or algorithms, and accordingly allow the electronic data processing program to identify and receive external data. Second, trial balance control. This measure allows the computer to automatically identify and correct data by using accounting methods or algorithms. Third, repeated input control and sequence check control. These two measures solve the problems of data deviation and data connection from different perspectives, so as to ensure data conformity and integrity. Fourth, total number control. The total number control ensures that the artificial input errors are controlled within acceptable limits and that the accuracy of system operation is not interfered with by human factors. Fifth, logical control. Logical control refers to the control of the relationship between accounting subjects and their document types.

2.2.2 Computerized accounting information system processing control

Processing control is mainly to complete the control of the computer system to process data. The accuracy of data processing cannot be guaranteed by determining input data, but instead by the effective control of data processing activities. Therefore, in the computerized accounting information system, the following data processing control measures should be set to ensure accurate data processing. First, processing output check measures. By checking the processing output, the computer auto-processed data will be checked again to ensure the reliability of data processing. Second, validity check measure. The validity of accounting documents should be checked. Third, error correction measure. Error correction can not only ensure the timely and accurate correction of errors in data processing, but also help in restoring changed data.

2.2.3 Computerized accounting information system output control

Output control is a control measure to ensure the accuracy of accounting practices such as general ledgers and subsidiary accounts. On the basis of accuracy guarantee, output control further ensures the rightness and security of important data transmission routes. The control measures are implemented in aspects of data format, data content, data transmission ways, and time dimensions, so as to avoid the occurrence of wrong transmission, multiple transmission and other transmission faults. The output control measures are of great practical meanings in the computerized accounting information system. Only by effectively implementing output control can the system outcome be applied in real cases, and accordingly improving the accuracy and effectiveness of accounting practices.

3. THE COMPUTERIZED ACCOUNTING SYSTEM INTERNAL CONTROL PROCESS UNDER THE NETWORK ENVIRONMENT

The traditional computerized accounting system was confined to one-of-a-kind computers or local area network. Currently, due to the wide use of Internet, computerized accounting systems will break the limited range of data transmission and maximize their functional and applicable value. The Internet-based computerized accounting system will calculate and check a variety of business items, and further provides scientific reference for enterprise decision-making. Enterprises establish Internet communication relationships with suppliers, sellers, government departments, and other external organizations through this system (Figure 3).

![Figure 3. Organization relation of enterprise and exterior organizations in computerized accounting system under Internet Environment](image-url)
The workflow of the computerized accounting system in the network environment is the process of data interconnection between the internal control system and the external environment via Internet. Branch companies or business departments transmit the data information through the network to the master computer database of the parent corporation that owns them. The master computer will analyze data statistically and upload the data output to related government offices through the Internet. Government offices such as industrial and commercial bureau, banks, and tax bureau will evaluate and check data according to certain criteria. Any inconsistent data, if there is, will be returned to the enterprise who will then return them to the branches or business departments requiring them to correct the data. The computerized accounting system categorizes the data that needs no collation or the corrected data, and automatically prepares and registers the vouchers in the primary and secondary accounts of the enterprise. The enterprise will disclose computerized accounting system data on the Internet according to the relevant management requirements for financial investors to refer to in making financial investments. Meanwhile, enterprise branches, business sector, bondholders, government departments and financial investors have the access to enterprise accounting information through the Internet. The computerized accounting system under the network environment will have a greatly expanded range of internal control. However, the network environment also brings high risk for internal control, and thus the security and maintenance of computerized accounting system will become an important research direction. In addition, the preservation of enterprise accounting records will increase the difficulty of achieving our research target.

4. THE WAY OF COMPUTERIZED ACCOUNTING SYSTEM INTERNAL CONTROL UNDER THE NETWORK ENVIRONMENT

4.1 Accounting data security control

Subject to many factors, accounting data and accounting information will possibly get missed, distorted or illegally replicated in the process of production, processing, storage and delivery. Accounting data security is the avoidance of such data phenomena through the effective internal control of enterprises by using the computerized accounting system. But this is not enough. Accountants or related managerial staff should actively strengthen the sense of accounting information security, plus with reasonable and rigid management systems to monitor accounting information. There are three main measures of security control. First, technological confirmation by digital signature. Digital signature serves for the lock of key accounting data, so as to avoid intercepting, tampering, missing or deleting data. To render digital signature further practicable, enterprises can add the extra encryption key to the digital information as a dual guarantee. Second, intensified auditing and monitoring. The internal control system will monitor accounting information, accounting data, and their changes. Data deletion or data correction has to pass two-tier auditing. Third, accounting information backup in time. Computerized accounting system internal control can automatically backup the relevant accounting data as well as some operational behaviors. With it, system data can be restored in the case of system data storage failure. Meanwhile, some important linked data are restorable through the operational records. (Figure 4)

![Figure 4. Safety control of accounting data](image)

4.2 Confidentiality control of accounting data

Accounting data confidentiality control requires a strong algorithmic coding technology to achieve. By encoding accounting data algorithms, accounting data are operable to users easily and secured against illegal operation.
The confidentiality control of accounting data can be realized through three measures. First, data privilege classification, whose dimensions include database log-in privilege, database administrative privilege and data resource management privilege. Second, accounting data classification. Through accounting data classification, users of different privileges acquire accessible accounting data, which helps in corresponding users to classified data. Third, accounting data encryption. Some key fields should be encrypted, such as account code fields of accounting software and comparable fields in relation operation. Data query conditions are unencryptable. (Figure 5)

![Accounting data security control](image)

**Figure 5.** Accounting data security control

### 4.3 Accounting data integrity control

Through the integrity control, accounting data can achieve consistency and correctness. The realization of accounting data integrity requires certain constraints on the logical relationship between accounting data. The main control measures are accounting data structure constraints, accounting data value constraints and dynamic constraints of accounting data. By restricting the logical relationship between accounting data, enterprises can set limits on the scope and type of accounting data and the precision of cross-level data. In this way, it is uneasy for the accounting data to undergo override control. Compared to regular accounting data definitions, the logical relationship based definition is more reliable, scientific, and steady.

### 4.4 System internal application and maintenance control

System application control includes data entry control, data processing control, and data output control. First, data input control, which refers to the authentication of input data by technical means. Only authenticated data have access to the system. Second, data processing control, which refers to the check of input data parameters such as format, record length and numerical number, and the evaluation of data security factors such as data infection. Third, data output control. The status of output data should be verified and checked its correctness. In addition, the whereabouts of output data should be verified to determine whether the data receivers are legal privilege users. The internal maintenance control of the system mainly includes code structure modification, software maintenance, as well as the adjustment and expansion of system functions. All maintenance-related operational actions are required to be recorded and stored both in the system and in paper formats.

### 4.5 Control of the connection between the intranet and the external environment

#### 4.5.1 Physical control

The primary matter of physical control is to set criteria on network quality and select networks of acceptable quality. The network coverage of computerized accounting system in Internet environment and Internet compatibility should be considered in combination with accounting practice workflow and accounting data security. The sharing of accounting data depends first on the confidentiality of accounting data, and the amount of accounting data needs to be considered in conjunction with system processing capacity. Economic efficiency is the criteria to measure system cost-effectiveness. Such metrics are the basic standards and principles under which enterprises establish models, conduct model analysis, and select reasonable network construction structures. Meanwhile, quality hardware facilities are the major contents of physical control. Computer hardware devices with huge storage space and fast data processing speed are the right master computers of the
digitalized accounting system. The requirements on network work station should be formulated not only according to enterprise situations, but also taking into full consideration the objective characteristics of the client.

4.5.2 Network port control

By limiting the landing number of fixed ports and setting login passwords as necessary, enterprises can guard the system from malicious software intrusion as much as possible. Moreover, master computers should disguise themselves to a certain extent, i.e. the establishment of “shadow” host. The shadow host will play a protective role in acting for the master computer in confronting malicious intrusion. The same strategy is applicable to user identity recognition. Dual port control serves users in identifying log-in commands in a special program, so that guaranteeing the security, confidentiality and integrity of accounting information to the maximum extent. The digitalized accounting system that is exposed to the Internet will be exposed to more uncertain Internet factors than before. In this case, the dual port control is more suitable for the operational needs of the digitalized accounting system.

5. CONCLUSION

Accounting information is of vital importance to an enterprise's management decision-making, which directly affects the market competitiveness and sustainable development of the enterprise. The computerized accounting system under the Internet environment breaks through the spatial limitation of the traditional computerized accounting systems, greatly enhances system quality and efficiency, and innovates the system data service capability. Accounting data security control, confidentiality control, integrity control, system internal application and maintenance control, and the relationship control between internal network and external environment are the core means of computerized accounting system internal control as well as the dimensions of internal control analysis model establishment. By scientifically modeling these crucial factors, enterprises can obtain scientific accounting big data for making management decisions, and guarantee the scientific nature of manufacturing, operational, and marketing strategies. Model analysis needs not only scientific analytical theories, but also the accurate and comprehensive model construction factors. In this paper, we decompose and explore the computerized accounting analysis system in the network environment from multiple aspects and dimensions, and analyzes its workflow, which provides full-scale reference dimensions and indicators for establishing corresponding model analysis methods. The internal control of computerized accounting analysis system in the network environment is an effective travel mechanism of accounting information and, particularly, an important management tool for enterprises to realize sustainable development in the new era.

REFERENCES