

# The Research of IS Auditing Theory System in Information Technology Era

YUN Biyan, GUAN Yamei  
Nanjing University of Finance and Economics, Nanjing, Jiangsu, 210003  
guanyamei@sina.com

**Abstract:** With the application of information technology in the society and enterprises, it has become an important managerial tool. Information system auditing (IS auditing) arose consequently. It is not only a pivotal way to improve enterprise management, but also a key step for traditional auditing to transit into IS auditing. This research established IS auditing theory system based on auditing objectives, auditing process, auditing foundation, auditing model, as well as IS auditing development tendency. The further research focus on the institution of information system audit in China and abroad, then give some suggestions on the construction of information system audit in China. This essay ends on an outlook for information system audit in China after pointing out the problems and the causes of information system audit in China and analyzing the environment that information system audit in China faces. In this essay, analyzing the opportunities for information system audit in China and pointing out that advanced management cultures abroad will promote the information system audit in China.

**Keywords:** IS auditing, theory system, auditing model

IS auditing, namely information system auditing, refers to the whole process for an auditing organization to organize and plan auditing projects, implement auditing with the help of information technology to assess whether the information system is safe, reliable, and effective. IS auditing also assesses the impacts of information system on financial statement, or produces independent auditing reports to identify auditing risk, evaluate enterprise information strategies, optimize company operation independently and objectively.

## 1. IS auditing review

### 1.1 1960s is the embryonic period of the Information Systems Audit (IS Audit)

With the gradual popularization of the computer's application in enterprise, enterprise began to deal with accounting information by the implementation of the computerization. Because of the e-enabled of paper accounting documents, auditor has to concern about the data-processing business such as electronic data's acquisition, analysis, computation in carrying out the traditional process of auditing. Since then, a prototype of information system audit - audit of electronic data processing (EDP Audit) arising. Specialized organizations for electronic data processing audit - EDP Auditors Association (EDPAA) was also established in 1969 in Los Angeles.

### 1.2 1970s is the development period of the Information System Audit

During this period, with the expanded scope of computer applications, electronic data processing and management information systems have been widely available in enterprise, both the theory and practice of information systems audit have been developed rapidly. In practical, business has a rapid increased demand of the EDP audit, computer-assisted audit techniques have been applied initially in practice. Institute of Internal Auditors Association of the United States put forward various computer-assisted auditing techniques, which is the breaking exploration in the field of using computer to audit computer information systems directly.

### 1.3 The Information system audit was matured in 1980s

With the rapid development of network and communication technologies in the 80's, the rapid development of enterprises' informationization in developed countries led to wide range requirements of information system audit in society, computer-assisted audit techniques has been widely applied. But

computer crime rose sharply, security system for information systems is still far from adequacy.

#### **1.4 The Information Systems Audit has entered a period of rapid universal development after 1990s**

Along with the rapid popularization of network technology, as well as the emergence of the ERP and e-commerce, information systems became more and more complicated and networks. How to ensure the information systems' safety, reliability and effectiveness on network platform have become more and more important. The strong demand of information systems audit was increasing in community, and information systems audit in developed countries has entered a period of rapid development of the popularity.

## **2. IS auditing procedure**

IS auditing procedure follows three stages, including preparation, implementing, and finishing phases .

### **2.1 Auditing preparation phase**

Auditing preparation phase is the starting point of the whole auditing procedure.

- A. Clarification of auditing subjects. Auditing personnel need to clarify auditing subjects and direction at the planning phase.
- B. Identification of auditing targets. IS auditing targets can be categorized as general objects and special objects. Generally speaking, IS auditing objects should include improving safety of the information system assets, enhancing data integrity, increasing system efficiency to utilize all system resources, as well as improving system validity.
- C. Determining auditing objects and scope. It refers primarily to the information system that is centered with computers.
- D. Formulation of auditing plan, as well as auditing service agreement. Primary tasks at this phase include:
  - A) Familiarize with client information;
  - B) Identify and evaluate risks;
  - C) Determine auditing place and facility;
  - D) Determine auditing resources;
  - E) Familiarize and evaluate auditing results from previous year.

### **2.2 Auditing implementing phase**

- A. Collecting and analyzing data and information;
- B. Determining auditing or testing methods;
- C. Looking up relevant policy, standards and criterion of the audited company;
- D. Testing all controls and appraising their fitness and appropriateness.

### **2.3 Auditing finishing phase**

- A. Evaluating test results;
- B. Communication with managers;
- C. Writing up auditing reports.

## **3. Theoretical basis for IS auditing**

Information is the most valuable assets in an organization. Therefore IS auditing is not only a simple extension of traditional auditing, but a multi-disciplinary field. As shown in figure 3, IS auditing is based on eight theories:

### **3.1 Information Technology Theory**

The information technology theory includes: the network technology theory, the data mining theory, the system integration theory, the multimedia theory, and the artificial intelligence theory etc. The application of these theories and technologies greatly enhanced the auditing efficiency and the auditing surveillance quality, expanded the auditing theory from the depth and the width.

### **3.2 Economics Theory**

The economics theory may transform our thinking mode, introduce the economics theory into auditing theory, which helps us analyze auditing theory development from the view of economics, enhance auditing efficiency, innovate auditing methods, as well as reduce auditing costs.

### **3.3 Judicial Theory**

First of all, the acquisition of true and reliable auditing evidence requires many judicial and detective methods. Next, in this auditing lawsuit detonation time, auditing personnel must learn to cope with numerous lawsuits with the help of judicial theory. Therefore, integration with judicial theory is an inevitable choice for the development of auditing theory.

### **3.4 Behavior Management Theory**

Behavior management is a comprehensive science to study individual's psychological behavior and interpersonal relationship with the help of management science, behavior science, sociology, physiology, ethics, and anthropology etc. In the auditing process, auditing personnel need to cope with all kinds of company and people. Therefore, the behavior management, as a basis of auditing theory, can not only fill the objective request for managerial auditing, but also provide valid auditing theory and methods.

### **3.5 Statistics Theory**

The application of statistics in auditing will help auditing personnel carry out linear regression analysis to test fitness of all variables in the econometrics model, which will dramatically improve auditing methods and the accuracy of the auditing results.

### **3.6 Philosophy Theory**

In auditing practice, auditing personnel can apply the concepts of moral ethics, the logic thinking modes, as well as the dialectical materialism thoughts of philosophy into auditing theory, which will help auditing personnel make appropriate decision. Meanwhile, these philosophy research idea/methods will shed lights into auditing practice.

### **3.7 Traditional Accounting and Auditing Theory**

The traditional accounting and auditing theory provides IS auditing with rich internal control theory as well as practical experience, which guarantee all transaction data processed correctly.

### **3.8 Computer Management System Theory**

Computer management system theory refers to how to better manage the development and operation process of information system. It dramatically improved the system capability to enhance assets safety, information integrity, as well as the enterprise's ability to meet targets.

## **4. IS auditing model**

### **4.1 Bypassing computer auditing model**

This model regards the computer as merely a machine to store and process data, auditing personnel only investigate input and output data, as well as the managerial methods. In fact, this model is similar as the traditional manual model. It is not intensive in auditing techniques, does not disturb daily work of the audited system very much. However, the auditing result of this model is not as reliable as that of other models, and the auditing scope is relatively limited.

#### **4.2 Passing-through computer auditing model**

This model is also called direct auditing. It audits not only input and output data, but also system programs, application programs, data files, as well as computer hardware of the company's computerized accounting system to appraise the reliability of its control and processing functions, to determine the nature, time and scope of the substantive test. The auditing risk of this model is low enough to be at the acceptable range. However, this model tends to disturb routine work of the company being audited. In addition, this model requires auditing personnel to grasp not only knowledge and techniques in computer science, but also data processing and data management.

#### **4.3 Computer-assisted auditing model**

Computer-assisted auditing model uses computer technology and auditing software to audit the accounting information system. This model enhances auditing efficiency, expands auditing scope, and improves reliability of the auditing conclusion. However, in this model, auditing personnel have to grasp relevant knowledge in computer science to utilize, as well as to code specific auditing program for computer-assisted auditing.

#### **4.4 Network auditing model**

Network auditing model is also called on-line real-time auditing. It refers that the auditing personnel carry out real-time auditing via network. This model can realize remote auditing to get real-time auditing evidence, improve auditing efficiency as well as surveillance function. Therefore, it represents the developing direction of auditing in the future.

### **5. IS auditing development strategies in China**

#### **5.1 IS auditing efficiency - establishing independent and objective auditing expertise system**

Expertise system is a new field in the application of artificial intelligence. It is an intelligent software system based on knowledge. The system summarize expertise's knowledge and experience to set up rules and store the database in computer to adopt appropriate control strategies to carry out inference and deduction from raw input data, to make conclusion and decision. It therefore plays an expertise's role in the field. Another advantage of the expertise system is that it is objective and independent because the expertise system is based on expertise's knowledge and experience, regulation, rules and policy, as well as inference mechanisms. Therefore it will guarantee an objective, honest and independent auditing attitude, as long as the system is developed independently.

#### **5.2 IS auditing software commercialization – coordination between accounting software and auditing software.**

First, as cited in Chapter 7 of 'Tentative regulation by Audit agency on computer-assisted auditing', "for the convenience of computer-assisted auditing, the computer application system of the audited company is required to have data output terminal which can export data at the format requested by audit agency. Therefore, all accounting software must have the standard data output terminal to transform data into standard format that can be recognized by auditing software, so as to save auditing time and efforts, improve auditing efficiency. The existing accounting software must be further improved to add data transformation module to export data at standard format to be compatible with auditing software, and to realize integration of accounting and auditing.

Next, accounting software should have the corresponding module to provide complete data revision record for clear and valid auditing evidence. This requests internal control surveillance subsystem in software development.

#### **5.3 IS auditing legislation – establishing authority of auditing laws and regulations**

First, IS auditing is not clearly defined and regulated in 'Auditing Law'. Therefore, it is the priority issue to clarify the legal status of IS auditing in legislation.

Next, the auditing evidence in IS auditing is primarily digital/electronic data, thus, the legal status of this

sort of auditing evidence is the core issue in legislation.

Third, with comprehensive and guiding auditing laws/regulations, auditing personnel are able to have access to data easily, quickly, and accurately, which is worry-free and trouble-free from mis-quotation of auditing laws/regulations.

#### **5.4 Introduce the concept of risk-based audit to develop information systems audit**

Risk-based audit's advantage is to classify system through risk identification and assessment, which put the audit resources on high-risk audit areas, decide audit's priorities and progress, to ensure the effectiveness of the audit as well as save cost and improve audit efficiency. Information system audit is the new audit model with a risk-based audit as its theoretical basis. Therefore, only introduced the concept of risk-based audit could help us understand the significance of information on system audit and vigorously promote its development in our country.

#### **5.5 Information systems audit rapidly develops with the extensive application**

It is foreseeable that the driving force of information system audit to audit technology will become stronger in the future. At present, information systems auditor's position has been decisive in many large accounting firms, information systems auditor has become one of the most sought-after talents in the global as well. Lot of large accounting firms put into enormous resources in the field of information technology, in order to achieve opportunity in the future audit market. With the expanding areas covered by enterprise information system, the demand for auditors raised more and more, the auditor must know more about the audited object in-depth and comprehensive.

#### **Author Biography:**

Yun Biyan (1974), female, Han nationality, lecturer of Nanjing University of Finance and Economics, Research Interests: Accounting and Auditing theories and practice.

Guan Yamei (1970), female, Han nationality, Associate Professor of Nanjing University of Finance and Economics, Research Interests: Accounting and Auditing theories and practice.

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