Empirical Study on the Reform of the Accounting Management Model for Small and Medium-Sized Enterprises Based on Cloud Computing

Yang Wang, Wei Zhang

Hebei Agricultural University, Baoding 071000, China

Abstract

Accounting informatization is the main trend in the development of the enterprise accounting management, while in the traditional accounting informatization construction, the enterprises often use a large amount of funds to purchase and maintain the hardware equipment, which however have been beyond the acceptable range for the small and medium-sized enterprises. Therefore, in the accounting informatization construction, the small and medium-sized enterprises often take the attitude of being willfully blind, thus resulting in low level of accounting informatization construction in China and being difficult to push the development of small and medium-sized enterprises. In recent years, with constant development of cloud computing, particularly the high-level building of the enterprise-class cloud computing service, new development space has been provided for the accounting informatization construction. Cloud computing means that the virtual processing is made on the computer software and hardware resources, so as to collect certain fund by providing the enterprises with the leased internet service, so that the enterprises can enjoy the multilayered and multimodal services. While the fund collected in such means shall be undertaken by the small and medium-sized enterprises, eliminating the expenses for the purchasing and maintenance of the equipment, usually more suitable for the small and medium-sized enterprises. Therefore in the background of cloud computing technology, the difficulty for the small and medium-sized enterprises in accounting informatization, playing an important role in pushing the accounting informatization construction of the small and medium-sized enterprises in China.


1. INTRODUCTION

1.1 Study Background

In the background with high development of market economy, there are more and more enterprises in China, particularly small and medium-sized enterprises, which have the increasingly higher percentage in the market. According to the statistics, in 2014, there were more than 43 million small and medium-sized enterprises in China, accounting for 99.3% of the enterprises, with the GDP contribution accounting for 55.6% of that of all enterprises, the taxes accounting for up to 46.2% that of all enterprises, and the amount accounting for 62.3% of total export amount, and the employment positions accounted for more than 75% that provided by all enterprises. It may be seen that, in the current market economy environment, the small and medium-sized enterprises have become the important part of the economic development in China, not only significantly pushing the economic development in China, but also providing a large amount of employment positions, and effectively alleviating the employment problems in China. Therefore, how to push the development of the small and medium-sized enterprises has become the main problem that should receive the attention in China. And due to the influence of the subjective or objective factors, the small and medium-sized enterprise has the service life of only 2-3 years, and thus is difficult to realize the sustainable development. In addition, due to the management approach error and the insufficiency in the management capability, the enterprise scale has not been effectively expanded after obtaining the scale benefit, and thus the enterprise cannot achieve the scale-based operation. While with high development of information technology, because of its advantageous characteristics, the informatization management approaches have become the main direction for the development of enterprise management, and is also used as the main approach for improving the economic benefits of small and medium-sized enterprises and elevating the competitiveness of small and medium-sized enterprises. While since the small and medium-sized enterprises take an important position in the economic structure in China, it is required to enhance the informatization construction level of small and medium-sized enterprises in order to improve the overall enterprise development level in China. Therefore, enhancing the accounting informatization
construction level of the small and medium-sized enterprises will have the considerable realistic significance in pushing the sustainable economic development in China.

1.2 Literature Overview

In the accounting informatization construction, a large amount of fund will be used for the equipment purchase, daily maintenance and personnel training. For the large enterprises, the fund consumed for informatization construction is acceptable. While the small and medium-sized enterprises have the limited benefits and the insufficient working fund, thus impossible to undertake the human resource and labor service cost inputted in the preliminary stage. In case of intentionally carrying out the accounting informatization construction, this might result in the breaking of the fund chain so that the small and medium-sized enterprises might undertake the irredeemable influence. In addition, the work in the traditional accounting management system lags behind, and cannot push the development of small and medium-sized enterprises, and would make the operation of the small and medium-sized enterprises fall into the endless loop (Li and Wang, 2015). By carrying out the accounting informatization construction by using the cloud computing, it is possible to reduce the demand of small and medium-sized enterprises for hardware, so that it is only required to pay certain expenses to the cloud computing service provider on a monthly basis in order to enjoy the cloud computing service, thus effectively enhancing the informatization construction level of the enterprises, constructing the complete information management system, and enhancing the sensing efficiency of the enterprise, elevating the market competitiveness of the enterprise, and laying solid foundation for the enterprise development (Xu et al., 2016). Small and medium-sized enterprises have been an important part of the market economy in China, and under the background with the deepening of the opening up and reform, there are more and more small and medium-sized enterprises, which are strong in promoting the employment, and play an important role in the economic development in China. As a modern management approach, the information management is the road to modern enterprise management, to improve the management efficiency and enhancing the enterprise competitiveness; the accounting information is the core information management system of the enterprise to improve the informatization level of the enterprise. So accounting is an important motive to improve the enterprise informatization level. To improve the informatization management level of the enterprises in China, it is required to improve the informatization management level of the small and medium-sized enterprises accounting for the majority of the enterprises. So, improving the informatization management level of the small and medium-sized enterprises will effectively improve the overall management informatization level of the enterprises in China, and play a very important role in the economic development in China (Mao and Liu, 2015).

2. QUALITY APPRAISAL MODEL OF ENTERPRISE ACCOUNTING INFORMATIZATION MANAGEMENT IN THE PERSPECTIVE OF CLOUD COMPUTING

2.1 Overview of the Analytical Hierarchy Process (AHP)

Analytical hierarchy process (AHP) is a method combining qualitative analysis and quantitative analysis, and it is simple for use and intuitive in results. It has wide application in many aspects. While in the enterprise accounting information management quality, the quality is mainly reflected in whether the economic benefits and management level of the enterprise have been improved. While the improvement of the economic benefits can be reflected by using the financial statement, and the management level is the item difficult for the evaluation with the quantitative indexes (Zhang and Shao, 2016). Therefore, the analytical hierarchy process (AHP) can be used to evaluate the accounting informatization construction quality, with the steps described below.

2.2 Construct the Judgment Matrix

For the judgment matrix A of the accounting informatization construction quality appraisal, the construction method is shown below:

\[
A = \begin{bmatrix}
    u_{11} & u_{12} & \cdots & u_{1n} \\
    u_{21} & u_{22} & \cdots & u_{2n} \\
    \vdots & \vdots & \ddots & \vdots \\
    u_{n1} & u_{n2} & \cdots & u_{nn}
\end{bmatrix}
\]
In analytical hierarchy process (AHP), it is required to compare the influence indexes in the same level in the above matrix, and evaluate the difference of the significance for two influence indexes (Li, 2016). The difference is mainly expressed with the scale of 1-9, and every scale has the meaning as shown in Table 1.

### Table 1: Compare the Meaning of the Result Scale

<table>
<thead>
<tr>
<th>Scaling</th>
<th>Explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The two are equally important</td>
</tr>
<tr>
<td>3</td>
<td>The former is slightly more important than the latter</td>
</tr>
<tr>
<td>5</td>
<td>The former is more important than the latter</td>
</tr>
<tr>
<td>7</td>
<td>The former is more important than the latter</td>
</tr>
<tr>
<td>9</td>
<td>The former is more important than the latter</td>
</tr>
<tr>
<td>2,4,6,8</td>
<td>Between the two</td>
</tr>
</tbody>
</table>

In the next step, it is required to carry out single hierarchical arrangement on the evaluated results. Single hierarchical arrangement, in principle, is the maximum characteristic value and characteristic vector, and the maximum characteristic value is $\lambda_{\text{max}}$, characteristic vector is $W = [w_1, w_2, w_3, ..., w_n]^T$, where, $AW = \lambda_{\text{max}}W$. The calculation formula is shown below:

$$\omega_i = \frac{1}{n} \sum_{j=1}^{n} \frac{a_{ij}}{\sum_{k=1}^{n} a_{kj}}$$  \hspace{1cm} (2)

In actual situations, it is required to carry out the consistency check, to judge whether the matrix conforms to the overall consistency. Only the overall consistency can ensure the judgment of rationality in matrix logic, thus it is required to continue analyzing the results (Zhang and Xu, 2017). The steps for the consistency check are shown below.

First, calculate the consistency index $CI$, with the formula shown below:

$$CI = \frac{\lambda_{\text{max}} - n}{n - 1}$$  \hspace{1cm} (3)

Second, it is required to determine the random index (RI) by looking up the RI table, with the value range as shown in Table 2.

### Table 2: Consistency Index RI

<table>
<thead>
<tr>
<th>Order number</th>
<th>RI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td>0.58</td>
</tr>
<tr>
<td>4</td>
<td>0.90</td>
</tr>
<tr>
<td>5</td>
<td>1.12</td>
</tr>
<tr>
<td>6</td>
<td>1.24</td>
</tr>
<tr>
<td>7</td>
<td>1.32</td>
</tr>
<tr>
<td>8</td>
<td>1.41</td>
</tr>
<tr>
<td>9</td>
<td>1.45</td>
</tr>
<tr>
<td>10</td>
<td>1.49</td>
</tr>
<tr>
<td>11</td>
<td>1.52</td>
</tr>
</tbody>
</table>

After finding out RI value, it is required to calculate consistency ratio (CR), with the formula below,

$$CR = \frac{CI}{RI}$$  \hspace{1cm} (4)

Finally, in case of $CR \leq 0.1$, it proves that it is possible to accept the consistency of the matrix, and the results are accurate (Ma and Liu, 2015).

### 3. BASIC DEMAND FOR THE ENTERPRISE ACCOUNTING MANAGEMENT MODE IN NEW PERIOD

#### 3.1 Typical Accounting Information Structure of Small and Medium-Sized Enterprises
The enterprise accounting management system in China has the history of more than thirty years, and the complete system has been formed, jointly pushing the development of the traditional enterprises in China. In the traditional accounting information management system, all focus on the account processing subsystems, while the payable subsystem, cost subsystem, fixed asset subsystem, salary subsystem, stock subsystem, purchasing subsystem and sales subsystem are linked with fund management and financial processing subsystem, jointly constituting the typical accounting information system structure of small and medium-sized enterprises (Lu and Wu, 2015).

3.2 Advantages of Cloud Computing Accounting Management

Compared with traditional accounting management model, the cloud computing accounting management has the advantages mainly in the following aspects,

**Table 3 Cloud Computing Model Compared with the Traditional Model of Information**

<table>
<thead>
<tr>
<th>Contrast project</th>
<th>Cloud computing model</th>
<th>Traditional mode</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Project content</td>
<td>Comparison results</td>
</tr>
<tr>
<td>Software</td>
<td>Hire fee</td>
<td>low</td>
</tr>
<tr>
<td>Hardware</td>
<td>Computer and network</td>
<td>low</td>
</tr>
<tr>
<td>Maintain</td>
<td>nothing</td>
<td>low</td>
</tr>
<tr>
<td>Convenience</td>
<td>unified management</td>
<td>convenient</td>
</tr>
<tr>
<td>Construction speed</td>
<td>Fast</td>
<td>fast</td>
</tr>
</tbody>
</table>

3.3 Selection Factors of Cloud Computing Service Supplier

3.3.1 Payment Mode

Now the payment modes provided by the cloud computing service suppliers are generally classified into the payment on the annual, monthly daily and even hourly basis. Since the business quantity of the enterprise is not unchanged but has certain periodic fluctuation. Therefore, the enterprise is required to choose the most reasonable payment mode according to the specific demand, thus effectively reducing the payment cost of the enterprise (Chen and Fan, 2015).

3.3.2 Supplier Network

Cloud computing undertakes the storage and analysis function of the mass information data, and raises critical requirements on the network quality and performance. Whether the cloud computing service supplier has independent content distribution network is an important reflection of evaluating the qualification of cloud computing service supplier (Li, 2015).

3.3.3 Safety and Stability

Safety and stability is the first element for the enterprise to choose cloud computing service supplier. Only after guaranteeing the safety and stability of the information, and guaranteeing the integrity of the financial data file, it is possible to guarantee the enterprise demand. It is required to carry out the survey from multiple aspects, such as all-weather service, data access authority, and encryption measures of transportation and storage (Wei and Lu, 2015).

3.3.4 Technological Level

The technological level of cloud computing service supplier has direct impact on the cloud computing service
quality. The enterprise is required to evaluate the fame, development team qualification and professionality of the cloud computing service supplier in this industry, thus effectively avoiding the happening of the cloud computing loopholes.

3.3.5 Exit Mechanism

The enterprise generally does not have long-term cooperation relations with the cloud computing service supplier. When the enterprise has the enlarged business demand and the increased scale so that the cloud computing service supplier cannot meet the enterprise demand, the enterprise will look for other cloud computing service supplier. Therefore, how to transfer the information data has become one of the key problems to be emphasized. Thus before signing the transaction contract, it is required to define the exit mechanism proposed by the cloud computing service supplier, describe the rights and responsibilities of both parties, thus reducing the exit cost.

3.4 Overall Demand of the Enterprise Accounting Informatization

3.4.1. Unified Accounting Demand

The current enterprise accounting work is mainly of the decentralized or centralized type, and the accounting system, means and basic information of most of the small and medium-sized enterprises do not have the clear standard. In addition, the accountants of different companies will raise different accounting items, which thus have certain impact on the financial statement summary, check and management. Therefore, in the enterprise accounting informatization management model based on the cloud computing, it is required to specify a unified standard for different financial information of the subsidiaries, save it into the database, and construct a financial accounting management platform. In addition, with constant development of the enterprise and constant improvement of the financial information, it is required to gradually withdraw the substitute accounting and cultivate the professional personnel. (Wu, 2012).

3.4.2 Unified Fund Management Demand

Fund is the important basis for maintaining the enterprise survival and development. For the enterprise, the significance of the fund does not lie in the condition that it can purchase something, but in the use of the fund to create the value. If the enterprise has low fund management level, the development prospect of the enterprise will be very limited. Therefore, the small and medium-sized enterprises shall construct the unified fund management platform, push the transparent and systemized development for the fund management of small and medium-sized enterprises, have clear understanding of the fund use, inventory, structure, profit and risk, and have fuller use of fund and achieve the goal of promoting the improvement of the economic benefits in the enterprise.

3.4.3 Financial Analysis Demand

The financial management department of the enterprise will regularly prepare the financial statements, which mainly reflect the financial standing in certain time or in certain specific date. The financial statements mainly include balance sheet, income statement and cash flow statement. Under the background of cloud computing, the enterprise can automatically generate the financial statement according to the demand, and introduce a complete financial analysis system, for the manager in the decision management.

3.5 Construction of the Enterprise Accounting Informatization Management Model Based on Cloud Computing

3.5.1 Qualification of Cloud Computing Service Provider

Before the construction of the accounting informatization management model, it is required to have clear knowledge of the operation scale, operation qualification and service record of the cloud computing service supplier. These have directly reflected the service level of the cloud computing service supplier. Besides, it is required to define the business range of the cloud computing service supplier. Different cloud computing service suppliers focus on different fields, some on financial work, some on sales, human resources and collaborative office. Only the professional cloud computing service supplier can guarantee the supply of the professional
service (Du, 2012).

3.5.2 Consulting Capacity of Cloud Computing Service Supplier

In the transaction between the enterprise and the cloud computing service supplier, the supplier is required to know the actual demand of the enterprise, so as to develop the most reasonable informatization construction scheme. And provide the enterprise with the diversified service options. Excellent cloud computing service supplier can help the enterprise avoid the bends in the informatization building, and plays an important role in pushing the development of the enterprise accounting informatization (Jin and Wei, 2012).

3.5.3 Cloud Computing Service Quality

The service quality of the cloud computing service supplier has direct influence on the analysis and processing of the financial information provided by the enterprise. So before choosing the cloud computing service supplier, the enterprise is required to have clear knowledge of the service quality of the service supplier, choose the most reasonable charging mode according to specific demand, thus improving the accounting informatization management level and reducing the enterprise operation cost.

3.5.4 Security and Integrity of the Financial Information Data

The information data provided by the enterprise is generally in huge amount. To make full use of the storage space of cloud computing and reduce the impact since cloud computing is attacked, the supplier often separates the information data provided by the enterprise into several data blocks, which are then stored in different racks. While such separation of the financial information will easily create non-trust on the cloud computing service supplier, thus requiring the cloud computing service supplier to enhance the emphasis on the information data security and integrity, and add the information label with about 5-byte into every whole data file, so as to maximally guarantee the security and integrity of the financial information data (Teng and Liu, 2012).

REFERENCES

Li Z. (2015). "Internet plus" grasp the pulse of the times were open a new chapter of informatization construction of management accounting -- "management accounting practice, China into the information industry seminar held on, finance and accounting, (15), 76-77.
Wei W, Lu X.Q. (2015). Discussion on the effective implementation strategy of management accounting
informatization under Financial Shared Services, financial circles (Academic Edition), (20), 211, 334.
Zhang X.P., Xu K. (2017). "Internet plus" from the perspective of the present situation of accounting service information management research -- Taking Shaanxi Province as an example, service accounting management accounting friends, (6), 129-133.