

Construction of Conceptual Framework of Intelligent Accounting Under the Condition of New Generation Information Technology

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ABSTRACT

With the vigorous development of a new generation of information technology and the diversification of social needs, the information lag and singleness of the traditional accounting system have become increasingly prominent, and it is difficult to meet the current economic and social development. We find that the new generation of information technology optimizes the process of data collection, data storage and analysis, and data application, which promotes the emergence and development of “efficient, diversified and intelligent” accounting. We further propose the concept, characteristics and realization path of intelligent accounting, and construct a conceptual framework of intelligent accounting with basic assumptions, elements, and processes as the main content. It’s of great importance for improving the accounting theory system and adapting to the increasingly diverse, efficient, and intelligent new needs.

Keywords: *Intelligent accounting, Conceptual framework, New generation of information technology.*

1. INTRODUCTION

As a product of the development of social productivity, accounting is closely related to the development of society and economy. From the middle of the 20th century to the present, the reform of accounting has gone through the following three stages: (1) The emergence and application of computers in the middle of the 20th century ushered in the era of computerized accounting. Computerized accounting replaces part of manual labor in the form of simulated manual accounting, completing tasks such as bookkeeping, settlement and reimbursement, which improves work efficiency[1]. (2) After the 21st century, the rapid development of the Internet has made computer networks clearly visible in every field of society, and accounting has become networked. Relying on an open network environment, accounting in the network age makes up for the lack of independent and closed computerized systems. It can help people use network technology to achieve financial management, and greatly improve the utilization of resources. (3) In recent years, the rapid development of a new generation of information technology represented by cloud computing, big data, internet of things, artificial intelligence, and blockchain has caused tremendous changes in the environment which accounting is facing, and the current accounting

model is also suffering from a huge impact. The era of intelligence of interconnection of everything, intelligent computing, and open sharing has begun[2].

In 2017, the State Council of China issued the “New Generation Artificial Intelligence Development Plan” to cultivate a high-end and efficient intelligent economy. General Secretary of the Central Committee of the Communist Party of China Xi Jinping pointed out that it is necessary to promote the implementation of the national big data strategy, propel the integration and open sharing of data resources, and accelerate the construction of a digital China. The report of the 19th National Congress of the Communist Party of China also pointed out that China’s economic structure is continuously optimized, and emerging industries such as the digital economy are booming. The government’s requirements and emphasis on the digital economy have deepened the intelligent and personalized processing of accounting information. At the same time, it promotes the generation and development of digital assets. The digital economy strategy requires the development of accounting to be intelligent and efficient. The government’s digital strategy has pointed out the direction for the future development of accounting.

In order to cooperate with the national digital macro strategy, the Ministry of Finance of China has successively promulgated and formulated various policies to promote the digital transformation of accounting. In September 2015, in accordance with the strategic deployment of the Party Central Committee and the State Council of China to promote the “Internet +” action, the State Administration of Taxation issued the “Internet + Taxation Action Plan” to outline the tasks of inclusive taxation and intelligent taxation blueprints across the country. In 2018, the Ministry of Finance issued the “Implementation Plan for the Cultivation Project of Internationalized High-end Accounting Talents”, which embodies the government’s plan to cultivate high-level accounting talents to lead the accounting industry to become more international. The formulation and implementation of laws and regulations strengthens the management and standardization of accounting, and requires accounting to provide information to decision makers more accurately and quickly, which provides a policy guarantee for the efficient and intelligent development of accounting.

The traditional accounting model can no longer meet the new needs of high efficiency, diversification, and intelligence presented in the social and economic development under the new generation of information environment. Facing the opportunities and challenges of the era of wisdom, traditional accounting theories must be changed and adjusted. The concept of “intelligent accounting” is gradually emerging, and the construction of related theoretical systems is relatively lacking. It is of great practical significance and theoretical value to discuss the connotation and framework of intelligent accounting. Therefore, based on the new generation of information technology, this paper analyses its impact on accounting, defines intelligent accounting, and constructs the conceptual framework of intelligent accounting.

2. THE INFLUENCE OF THE NEW GENERATION OF INFORMATION TECHNOLOGY IN ACCOUNTING REFORM

This section will introduce the role of cloud computing, Internet of Things, big data, artificial intelligence, blockchain and other new-generation information technologies in data collection, storage and analysis, and application. The advancement of technology provides a guarantee for the reform of accounting.

2.1. Data Collection

When the data is generated, the new generation of information technology can collect the required data. The impact of this data collection capability on accounting is mainly as follows:

It ensures the integrity of accounting information. The Internet of Things collects needed information in real time through various sensing devices. Enterprises can use sensors of the Internet of Things to convert items into electrical signals in the procurement of raw materials, warehousing and sales of goods to complete the storage of electronic information, ensuring the integrity of information;

It ensures the accuracy of accounting information. The accuracy of electronic information collected through new technology is beyond the reach of traditional manual recording. It is conducive to users of accounting information to make more objective decisions;

It ensures the timeliness of accounting information. The new generation of information technology saves a lot of manpower and material resources through machine collection, obtains accounting information in time, and improves accounting efficiency.

2.2. Data Storage and Analysis

After the data is collected, it needs to be stored and calculated and analysed before it can be used by the enterprise. A new generation of information technology has built a storage platform for it. It also calculates and analyses the data. The impact of data storage and analytical capabilities of these technologies on accounting is mainly as follows:

It realizes the sharing of financial resources. Traditional accounting software is installed on a computer or local area network, while “accounting cloud” is online accounting software that can be used at any time and any place via the Internet, which will reduce the duplication of personnel, software and hardware systems, and reduce overall operating costs;

It strengthens financial management and control. It realizes data centralization through financial digitization and cloud transformation, provides accurate, timely and complete accounting information for management, deeply participates in business operation and improves operation ability;

It forecasts the future development. Big data thinking promotes unstructured and fragmented data to become big data, which can be used to analyse the relationship between it and the value of the enterprise[3], which helps enterprise information demanders to make correct decisions.

2.3. Data Application

The purpose of collecting, storing and analysing data is application. Perfect and accurate data collection, as well as the use of big data and other data analysis technologies, broaden the scope of data application:

It can personalize the company's panorama. With the maturity of blockchain, Internet of Things and other technologies, the information collected by enterprises takes financial data as the main line, forming vertical information around the upstream and downstream chain of financial information. The information network is detailed to every employee inside the enterprise and expanded to other enterprises in the industry externally[4]. It is dominated by financial information and reflects the overall situation of the enterprise. According to different users, this information will be directed to different individuals, showing individuality and diversification, and helping stakeholders understand the company.

It can optimize decision-making in complex scenarios. With the development of society, the competitive environment facing enterprises becomes more and more complex, and the future uncertainty increases. In complex environment, the new generation of information technology to help managers make optimal decisions is one of its application scenarios. The complexity of internal and external environment makes it difficult for management decision to rely solely on experience. Managers need to rely on big data, artificial intelligence and other information technologies to find risks in enterprise production and opportunities in the external environment, so as to help enterprises make decisions.

It enables efficient allocation of resources. Resource allocation includes internal resource allocation and external resource allocation. The development of the Internet of Things can help enterprises to grasp the performance and efficiency of assets. Big data and other technologies can help companies identify productive jobs or departments. All these can help enterprises to allocate internal resources. The allocation of external resources is the allocation of public resources by the government. The government relies on big data, cloud computing and other information technologies to monitor and govern enterprises with negative externalities in real time, and allocate social resources to enterprises with high productivity and efficiency and no negative externalities to achieve efficient allocation.

3. THE CONNATATION OF INTELLIGENT ACCOUNTING

The changes in the macro environment have made the limitations of traditional accounting increasingly prominent, and the new generation of information technology has led to the need to make a new definition of the conceptual framework of traditional accounting to meet the changes in economic and social development.

3.1. Definition of Intelligent Accounting

For intelligent accounting, there is currently no universally recognized authoritative definition. Based on related research [7,11], this paper defines intelligent accounting as follows: intelligent accounting is the integration of new generation of information technology such as big data and artificial intelligence with the personal tacit knowledge and experience skills of accountants, which provide low cost, highly automated, real-time, ubiquitous and intelligent solutions for accounting, financial management, auditing, and enterprise-related management decision-making. It deeply integrates financial functions, promote the integration of industry and finance, realize intelligent financial management, and liberate accounting personnel. Finally, it provides intelligent support for high-level investment and financing, operation management and business decision-making.

3.2. Features of Intelligent Accounting

3.2.1. Accounting process automation

Enterprises use the Internet of Things, RPA and machine learning, expert systems, relying on smarter financial software and more flexible information to automate the entire process of accounting automation, which reduces costs, improve efficiency, reduce errors. In the input of accounting information, the machine replaces humans to objectively perceive the internal business activities and external environment of the enterprise, and automatically complete the collection and entry of accounting data; In the output of accounting information, the system uses finer granularity to describe the results of automatic processing, and dynamically, channelized, personalized display of multi-dimensional financial report information, to meet the needs of enterprise internal and external decision makers.

3.2.2. Real-time provision of accounting services

Relying on existing information technology, accounting information can be collected in real time, breaking the time and space constraints, and passing these data to those who need information. Enterprise managers, internal employees and even external personnel can select the required accounting information in a timely manner according to different requirements in the work, and generate personalized real-time accounting reports, realize the dynamic reflection of data, and meet the real-time query of different stakeholders need. Through real-time accounting information, real-time comparison and analysis of business activities by enterprises can help enterprises make timely decisions that are conducive to their own development, thereby improving business efficiency and benefits.

3.2.3. Intelligent accounting decision support

Based on the artificial intelligence platform, intelligent financial tools understand the logical thinking of human acquisition, processing, analysis, prediction and decision making through repeated deep learning and data mining. It automatically collects, monitors, excavates and analyzes the financial data and macroeconomic data of enterprises in real time, so as to provide basis for prediction, in-process control and post-process analysis of enterprise management decisions. In the future, intelligent accounting will give full play to the role of financial robots. Financial robots will self-modify the original analysis model according to the specific needs of the enterprise, and imitate financial personnel for financial forecasting, management and decision-making, so as to provide enterprises with better financial services and multi-dimensional decision support[5].

3.3. The Realization Path of Intelligent Accounting

The basic goal of intelligent accounting is to realize all-round intelligence in accounting and financial processes. It can be divided into the following three stages.

3.3.1. Build a financial intelligence sharing platform based on the deep integration of operation and finance

The integration of operation and finance refers to the organic integration of the three main processes in business operations: business processes, accounting processes, and management processes. It establishes the financial integration information processing process, inserts the financial management requirements in the key link of the business process, and fully combines the business management requirements in the financial management process to realize the comprehensive value chain management of information, logistics, capital and operation flow. The financial intelligence sharing platform is the carrier of the information flow of the value chain. It collects information from all regions and sub-sectors of the enterprise, realizes the effective integration of information and all-round information management, and provides effective information for the recording, reporting, decision-making and development of the enterprise. The financial intelligence sharing platform provides a foundation for information integration and decision-making, and is the mainstay of intelligent accounting.

3.3.2. Build an intelligent management accounting platform based on business intelligence

Business intelligence describes a series of concepts and methods to assist business decision making by applying fact-based support systems. It mainly uses modern data warehouse technology, online analysis and processing technology, data mining and data presentation technology for data analysis to assist business decisions and achieve commercial value. The intelligent management accounting platform, based on business intelligence technology, will integrate and analyze data to help managers plan and control various economic activities, and finally make decisions. This is the core platform that embodies the development and growth of intelligent accounting.

3.3.3. Build an intelligent financial platform based on artificial intelligence

As a branch of computer science, artificial intelligence is dedicated to studying the laws of human intelligent activities and constructing artificial systems with certain intelligent behaviours. The establishment of intelligent financial platform is the combination of accounting information and artificial intelligence, and the establishment of expert system based on the integration of various data flows. It replaces human beings to deal with complex analysis and decision-making problems, greatly liberates accounting personnel and improves enterprise operation efficiency. The intelligent financial platform is our vision for the future trend of intelligent accounting, and a brand-new platform that can respond to the opportunities and challenges of the society in the future intelligent era.

4. THE CONSTRUCTION OF THE CONCEPTUAL FRAMEWORK OF INTELLIGENT ACCOUNTING

This article refers to China's accounting standards to construct an innovative concept framework for intelligent accounting from the aspects of basic accounting assumptions, accounting elements and accounting processes.

4.1. Basic Assumptions of Intelligent Accounting

The essence of the hypothesis is a reasonable setting, which is closely related to the environment in which accounting is located. Traditional accounting assumptions are compatible with the accounting environment of the industrial economy era[6]. At present, the social and economic environment on which traditional accounting assumptions are based has undergone tremendous changes. For example, the continuous innovation and widespread use of derivative financial instruments and the rise of virtual companies have made the basic assumptions of accounting based on the traditional environment ineffective to a certain extent.

To adapt to modern development, the assumptions of traditional accounting also need to be optimized.

4.1.1. Accounting entity assumptions

In the new generation of information technology environment, the emergence of virtual enterprises has caused the theoretical circle to discuss whether the traditional accounting entity assumptions are still applicable. A virtual enterprise refers to a dynamic alliance in which two or more enterprises with resource advantages and core capabilities carry out complementary advantages on the basis of information networks in order to seize market opportunities or achieve a certain goal[7]. They do not have a fixed form and fixed spatial scope, and can continuously adjust the member companies of the alliance according to their own development needs, and even often dissolve and rebuild. Compared with stable accounting entities in the traditional sense, these virtual enterprises are special accounting entities with temporary and unstable nature. We should, therefore, understand accounting entity in a broader sense and extend the meaning of the accounting entity from a mere entity concept to the entity and the concept of the incorporeal[8], so as to clarify the space scope of the accounting of the "virtual" accounting subject, and correctly confirm and measure assets, liabilities, income, expenses and other accounting elements, in order to provide accounting information users with useful information.

4.1.2. Going concern assumption

Although the fierce competition environment has increased the operating risks and shortened lifespan of many companies, the assumption of going concern is still meaningful. Take a virtual enterprise as an example. After the project ends, it will be dissolved, but the resources it owns will not disappear. Enterprise members seized the new market opportunities and quickly formed a new virtual organization, so as to use their original resources to the new virtual organization. So in essence, virtual enterprises, like traditional enterprises, are established for their own survival and development. Therefore, for virtual companies, the assumption of going concern is still necessary. At the same time, since the basic goal of financial accounting to provide useful information for decision-making has not changed, the provision of accounting information still needs to be based on the continued existence of the accounting entity. It is necessary to adhere to the assumption of going concern. In the information technology environment, we should give continuous operation a new connotation, and grasp it more dynamically.

4.1.3. Accounting period assumptions

The development of a new generation of information technology allows accounting informants to obtain real-time viewing. The real-time nature of accounting information eliminates the time breakpoint of accounting period, and it seems that traditional period is no longer necessary. However, what real-time information denies is "periodical information", not "accounting period". Companies still need accounting period to allow corporate stakeholders to understand the production and operation of the company in different periods. The difference is that the intelligent age is to make the accounting period flexible. The accounting cycle should be combined with the company's own development needs, and appropriate adjustments should be made according to the changes in the complete production and business cycles, so as to provide managers with timely and beneficial decision-making support.

4.1.4. Monetary measurement assumptions

On the one hand, the development of a new generation of information technology has strengthened international economic and trade activities and expanded the risks in the capital market. At the same time, the emergence and use of more and more "electronic money" makes money gradually become the product of notion. It intensifies the currency risk faced by accounting subjects and impacts on the assumption that currency value remains unchanged. Therefore, with the development of information technology, more stable measurement units such as electronic money may appear.

On the other hand, more and more non-monetary information is needed by users of financial reports, such as human resources, goodwill, and corporate external environment. This information, which is important for decision making, is difficult to quantify in monetary terms. As the disclosure of non-monetary accounting information is becoming more and more demanding, the accounting information provided by pure monetary measurement is increasingly unable to meet the needs of information users. Therefore, it is necessary to replace currency measurement with a multiple measurement system centered on currency measurement. In addition to the currency measurement system, the multiple measurement system also uses non-monetary indicators and qualitative rather than quantitative indicators.

4.2. Elements of Intelligent Accounting

4.2.1. Assets and Liabilities

In traditional accounting, most assets are made up of tangible assets, such as cash on hand, fixed assets, etc., and intangible assets account for only a small portion. With the increasingly significant role of information technology, intangible assets that were previously

ignored and resources that were not included in asset accounting may need to be included in the balance sheet, such as reputation, human resources, and data. Take data assets as an example. In traditional accounting, the costs and benefits of data are difficult to measure reliably, so they cannot be recognized as assets. In the era of new information technology, the benefits and costs brought by data will be reliably measured by big data technology, and thus belong to the asset class.

The use of information technologies such as the Internet of Things and big data can help companies predict the future earnings of assets and liabilities. Assets and liabilities are no longer only measured through past transactions. Enterprises can record assets and liabilities that will bring changes in economic benefits in the future through predicted results. The scope of accounting assets and liabilities will develop and change in the future. Current economic resources that have the potential to generate future economic benefits are included in the scope of assets and liabilities, and assets that cannot bring economic benefits to the enterprise will be liquidated.

4.2.2. Income and expenses

Under the new generation of information technology, the increase of business content will lead to the expansion of income range. Mainly reflected in two aspects:

One is the change of business model. In traditional accounting, the completion of sales represents that all risks have been transferred and revenue and expense can be recognized. However, with the development of society, service has become the key to the competitiveness of enterprises. The business model is not just about products, but about value-added services related to products. From the perspective of income, in the past product sales meant to achieve profits. In the age of wisdom, value-added services after sales is the key [9]. The completion of the sale can only guarantee this transaction, but value-added services can improve customer satisfaction and later transaction frequency which should also be included in the income category. From a cost perspective, these value-added services come at a cost and should be included in the corresponding costs.

The other is the change in business content. Companies use data such as clicks, page views, likes, and praise information to judge and analyze customer behavior preferences, value orientation and other characteristics, and formulate personalized products and services for different customers. In addition, new businesses of data sales and purchases can be derived from the original data, which expands the content of income and expenses.

4.3. The Process of Intelligent Accounting

4.3.1. Confirmation of accounting elements

4.3.1.1. confirmation basis

There are two basis for accounting confirmation: accrual basis and cash basis. In traditional accounting, whether it is the US Financial Accounting Standards Board (FASB) or the International Accounting Standards Board (IASB) in the conceptual framework structure system, it is assumed that accrual accounting provides more useful information about a company's earnings than financial performance on a cash basis. With the rapid development of information technology today, the real-time nature of accounting information can be guaranteed through big data, cloud computing, etc., so that accounting information can be confirmed when it is "received or paid". The cash-basis of the results can be guaranteed even more during application. However, this does not mean a change in the status of the accrual basis. The accrual basis reflects the essence of accounting matters better than the cash basis, and it will still dominate the main position. The enterprise should determine the basis of confirmation based on the specific accounting information required.

4.3.1.2. Confirmation scope

Some intangible assets, such as human resources, reputation, etc., cannot be reliably confirmed at current stage, but whether the assets need to be confirmed depends on whether they can bring value to the enterprise. The value of these intangible assets is the total value that an enterprise can obtain by owning them, including original value, incidental costs, and appraised value added (or impairment). Because these intangible assets bring different values to enterprises of different development levels, the asset value is confirmed by each enterprise according to the actual situation. At the same time, the scope of confirmation should be expanded from confirming the past to confirming the future. With the application of technologies such as big data and cloud computing, accounting elements are not only based on the past, but also look to the future to confirm the economic benefits that may be created in the future. Therefore, the future risks and opportunities of the company need to be included in the scope of confirmation.

4.3.2. Measurement of accounting elements

Technologies such as the Internet of Things promote changes in the measurement of accounting elements, mainly in three aspects:

4.3.2.1. the measurement attribute changes

Traditional accounting theory is restricted by accounting measurement conditions, so the historical cost is the most important accounting measurement attribute. The lag of historical cost affects the evaluation of enterprise value. With the development of new information technology, online information has become more open and transparent, and the trading environment has become more fair and just. The accuracy and transparency of accounting information become higher, and the market value of products can be more easily obtained, which will expand the range of fair value measurement attributes. The proportion used by other measurement methods such as net realizable value will also increase, and the proportion of historical cost measurement attributes will decrease.

4.3.2.2. the measurement result is more accurate

In the process of accounting measurement, when considering how to reflect the value of the confirmed object, in addition to considering the selection of appropriate measurement attributes, we should also consider the accounting environment, such as price changes, exchange rate changes, especially the impact of inflation. Traditional accounting uses simplified processing methods that do not reflect the impact of the accounting environment. However, information technologies such as the Internet of Things and artificial intelligence enable accounting measurement to combine the impact of the accounting business itself and the accounting environment, so that the measurement results will be more accurate.

4.3.2.3. the units of measurement are more diverse

In the era of wisdom, the types of information generation and transmission are more diverse, and the measurement units of information will be more diverse. In addition to currency, measurement units such as quantity, time, and information flow will also increase.

4.3.3. Recording of accounting information

The traditional accounting process is mainly based on records, and mainly relies on accountants to record data. It can only store currency information that can be confirmed and measured, and cannot provide non-monetary information[10]. However, with the development of technologies such as blockchain and big data, data is no longer stored by accounting personnel, but is recorded completely by information technology to ensure the integrity, accuracy and unalterability of information. In addition to the recording of financial data, companies pay more attention to the recording of unstructured information.

4.3.4. Reporting of accounting information

The impact of the new generation of information technology on accounting reports is mainly in three aspects:

4.3.4.1. changes in report content

At the present stage, the phenomenon of information disclosure overload of financial reports is increasing. Part of the reason is that the disclosure of off-balance sheet information is of low quality, resulting in unnecessary redundant. This may cause the information users to be disturbed by unimportant off-balance sheet information, which in turn will affect their subsequent investment decisions. With the development of artificial intelligence in the future, artificial intelligence can judge and filter useful information, independently generate financial reports, and help people make decisions[11]. This can reduce labor costs and ensure the true accuracy of reports.

Non-financial information such as the marketing flow and page view is becoming more and more important in management decisions. However, the original three statements cannot disclose these information, and the enterprise can only disclose non-financial information in the off-balance sheet, resulting in the overload of off-balance sheet. There are growing calls for a "fourth table" that focuses on business data with non-financial data as its core. It provides more comprehensive performance evaluation for enterprises, helps enterprises to understand the characteristics of the industry and customers, and make decisions for future development.

4.3.4.2. changes in the presentation of reports

The previous single print report may be replaced by a visual DV report, and corporate management or supervisors can dynamically understand the report through video, making the report more readable. The combination of big data and artificial intelligence technology can automatically analyze the characteristics of information users, and formulate diversified and personalized reports according to different people to meet their needs, so that non-accountants can also understand financial reports and directly master their own needs. Managers can generate financial reports according to their own needs, that is, self-service reports.

4.3.4.3. changes in the speed of report generation

Restricted to manual preparation in the past, financial reports often take days or even months after an accounting period is over. It is difficult for managers to obtain the financial information needed for decision-making in a timely manner. When the information is available, corporate decisions have already been made. The lagging information seriously reduces its supporting role in management decision-making. The development

of artificial intelligence such as block chain has ensured the real-time nature of reports, and companies can obtain relevant financial reports at any time to achieve real-time.

5. CONCLUSION

With the rapid development of a new generation of information technology, the problems of singleness and lag in traditional accounting have become increasingly prominent, and there is an urgent need to redefine the conceptual framework related to traditional accounting. The new generation of information technology optimizes the process of data collection, data storage and analysis, and data application. We then promote the generation and development of “efficient, diversified, and intelligent” accounting by defining the intelligent accounting and optimize the conceptual framework. In general, this article refers to the traditional accounting conceptual framework as a whole, combined with a new generation of information technology, and constructs an intelligent accounting conceptual framework from the aspects of accounting process, elements, and quality characteristics. The below Figure 1 is the framework diagram of intelligent accounting, which summarizes the framework structure of the above.

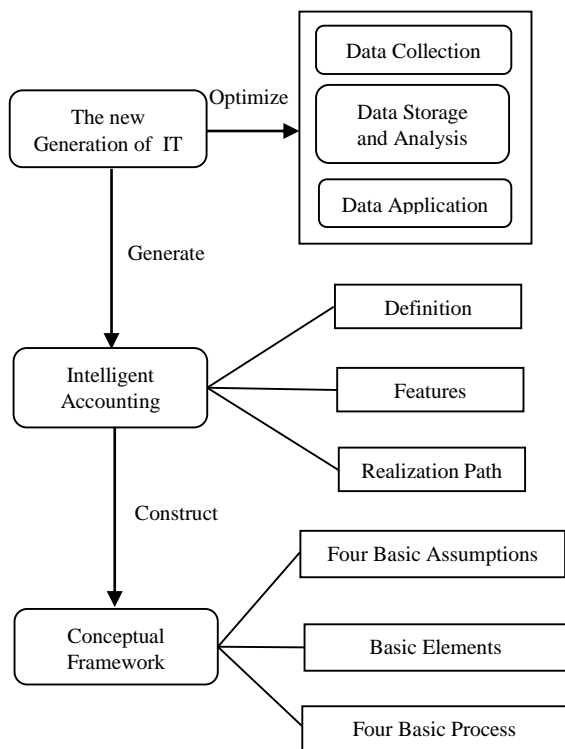


Figure 1 The framework of intelligent accounting

Although this article has initially constructed the conceptual framework of intelligent accounting, the new generation of information technology is still in the early stages of development, and the definition of intelligent accounting in terms of institutional norms is relatively vague, the development of intelligent accounting still needs further exploration and testing. In the future, we

will continue to improve intelligent accounting related research from intelligent accounting application scenarios, intelligent accounting and corporate process reengineering, intelligent accounting and corporate value.

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