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UNRAVELING DATA ASSET ACCOUNTING: A BEGINNER'S GUIDE TO IDENTIFICATION AND VALUATION

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Abstract: In the contemporary era, marked by the pervasive influence of artificial intelligence and information technology, information intelligence has emerged as the cornerstone of development, giving rise to what is now commonly referred to as the "Intelligent Era." Within this era, the digital economy has gained remarkable momentum, reshaping economic landscapes.

The evolution of the digital economy can be traced from its rudimentary beginnings as simple data tabulations to its current sophisticated state, characterized by electronic data processing, extensive data volumes, and in-depth data analysis. In 2022, China's digital economy surged to new heights, reaching a staggering 50.2 trillion yuan, making it the world's second-largest contributor to GDP at 41.5%. The digital economy has assumed a central role in today's economic landscape, holding immense significance for individuals, enterprises, and nations alike.

This paper delves into the pivotal role of data resources in empowering contemporary enterprises. It explores the dynamic growth of China's digital economy, its influence on the national GDP, and its implications for modern business development.

Keywords: Digital Economy, Information Intelligence, Intelligent Era, Data Resources, Economic Development.

Background of the study

In the past, it was the agrarian era and the industrial era. With the exploration and development of artificial intelligence and information technology, information intelligence has become the main development mode of the contemporary era, and today's era is also called the intelligent era, in which the digital economy is developing with great momentum. And looking back at the growth of the digital economy, its initial form is a simple tabulated summary of data, with the generation of computers, the development of maturity to enhance the form of data from paper to electronic, from a small amount of data to a large amount of data, from a simple record summary to in-depth analysis and processing of data. Today, the digital economy has reached a development High-speed stage, as can be seen from the scale of China's digital economy in GDP, the scale of China's digital economy reached 50.2 trillion yuan in 2022, the total volume of the world's second, the proportion of GDP to 41.5%. The digital economy is occupying a pivotal position in the current economy, and is vital to the development of individuals, enterprises and the country, especially for enterprises today, which should be good at using data resources to

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empower development. The scale of China's digital economy and its GDP share in the past five years are shown in Figure 1.

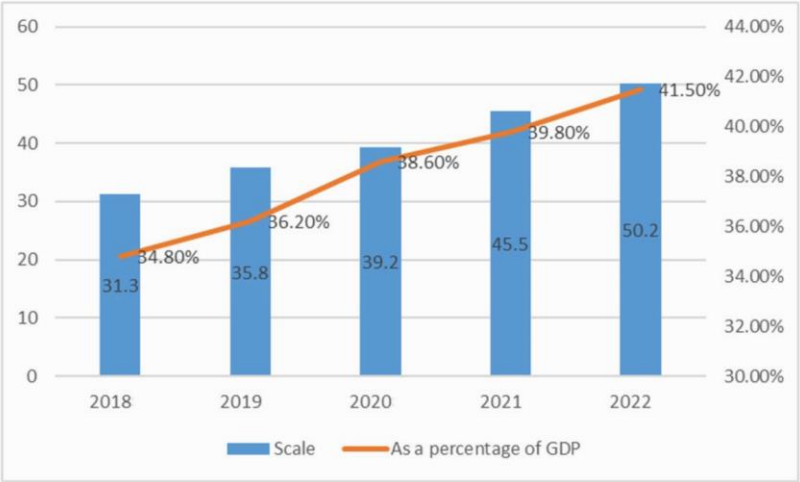

Figure 1: Size of China's data assets and share of GDP.

In 2011, Facebook's book assets were US$6.6 billion, while the market valued it at US$104 billion. The huge difference comes from the market's recognition of the value of the data owned by the company, and the value judgment of the data has been generated in the minds of investors. These values, if not recorded in the accounting statements, will directly affect the relevance of the accounting statements, thus, it is essential to assetize the data, which is conducive to the rational allocation of resource elements. On the one hand, the above case proves that numbers can bring great value to enterprises, and on the other hand, it also proves that it is crucial to do a good job in accounting recognition and measurement of data assets, otherwise it will be impossible to ensure the transparency of enterprise information.

In recent years, the development of digital economy has achieved remarkable results, but there are still problems in the management of data assets, such as the lack of a unified definition of data assets among economic entities, inaccurate valuation leading to unclear values in financial statements, and unreasonable measurement methods leading to errors in asset evaluation, which will affect the business management of enterprises. In order for enterprises to "ride on the east wind" in the era of digital economy, this paper discusses the definition, recognition and measurement of data assets in the following three aspects.

1. The concept of data assets

In the context of digital economy, it is common for companies to use data to create huge benefits, therefore, the definition of the concept of data assets has been widely discussed in academia, mainly in terms of utilization methods, characteristics, etc. Gartner Group considers big data to be characterized by large capacity, high rate of change, and diverse forms[1]. Mckinsey & Company believes that data can be collected, stored and analyzed, which is consistent with traditional resource elements[2]. Summing up the views of the above scholars, two aspects of the concept of data assets can be proposed: First, the data asset system is relatively large, i.e., the information content covered is massive, so the utilization of data has to be accomplished with the help of higher level data processing technology. Second, data assets can create value for enterprises, i.e., they are consistent with traditional resource elements, and therefore, the reasonable management of data assets is extremely important.

Original Article

The traditional definition of asset is that an asset is a resource formed by past transactions or events, owned or controlled by an enterprise, and expected to bring economic benefits to the enterprise. However, data assets do not fully meet the traditional definition of assets because they are predictive in nature and therefore do not meet the requirement of "formed by past transactions or events" in the traditional definition of assets. At the same time, data assets are extremely time-sensitive; a data set of customer preferences may only be applicable for one year, and similarly, a data set related to enterprise performance collected and processed two years ago will not bring benefits to the enterprise after two years, which reflects that data "formed by past transactions or events" does not meet the definition of assets. Therefore, in the process of defining data assets, it is important to expand the traditional definition of assets to achieve an accurate description of data assets.

One of the accounting objectives is truthfulness, i.e., to fully and accurately reflect the financial status of an enterprise, which includes the status of assets. Based on the accounting principle of substance over form, the definition of data assets cannot be determined simply according to the traditional definition of assets, and the relevant definition should be appropriately adjusted according to the unique nature of data resources, so as to prevent the ambiguity of financial data caused by the inaccurate estimation of data asset value, and in addition, the future economic inflow of data will not be confirmed, which will seriously affect the enterprise decision-making and business activities.

In 2023, the "White Paper on Data Asset Management Practices (Version 6.0)" was officially released with the definition of data assets: Data assets are data legally owned or controlled by organizations (government agencies, enterprises and institutions, etc.), recorded electronically or otherwise, such as text, images, voice, video, web pages, databases, sensing signals, and other structured or unstructured data, which can be measured and traded. Can directly or indirectly bring economic and social benefits.

2. Recognition of data assets

The definition of asset has been expanded in the above definition, and data assets need not be formed by past transactions or events. Therefore, the conditions for recognition of data assets include the following three aspects: 1. the asset must be owned or controlled by the enterprise; 2. it is probable that the economic benefits associated with the data resource will flow to the enterprise; and 3. the cost or value of the data resource can be measured reliably.

Data assets, as resources of the enterprise, must be controlled by the enterprise. The data generated in the course of business management activities is used by the enterprise itself and has nothing to do with other market entities, and its ownership and control are exclusive to the enterprise only. This is not only an asset, but also one of the conditions for the recognition of data assets.

As a new type of asset in the information age, the economic benefits associated with data resources may not all flow into the enterprise, which indicates that the raw data collected by the enterprise in its business activities are not all data assets of the enterprise, but also require investment in labor and technology costs, and eventually bring in economic benefits after screening and processing processes. The premise of data asset recognition is that data resources can bring economic value to enterprises and enhance their benefits. Therefore, whether enterprises use data assets for external transactions or their own operations, they need to ensure that the economic benefits related to data resources are likely to flow into enterprises.

Original Article

Accounting measurement is the basis of accounting, and at the same time, it is also an important guarantee for the accuracy of data related to financial statements. Only true and accurate measurement can ensure the correctness of business operators' decisions. At present, the data resources held by enterprises are mainly used in two ways: one is for external sales, and the other is for enterprises' own use. The former is traded in the market, and with the gradual improvement of the big data market, relevant laws and regulations, and the continuous development of data trading centers, the big data assets used for trading can be measured by the market price. The latter is mainly combined with the business model of enterprises to bring economic benefits to enterprises by helping them save costs, plan development strategies or directly participate in operations.

3. Measurement of Data Assets

The selection of appropriate measurement attributes is an important basis for truly and accurately reflecting the value of data assets and ensuring the relevance and reliability of the quality of corporate accounting information. Therefore, when measuring assets, different accounting measurement attributes should be adopted according to the different nature of assets. The current accounting standards in China stipulate that the measurement attributes of assets are: historical cost, present value, fair value, replacement cost and net realizable value.

Which measurement attribute should be selected for the big data assets owned by enterprises, on the one hand, should consider the difference of measurement attributes; on the other hand, the selection needs to be combined with the characteristics of data assets.

4.1. Historical cost measurement

Since data assets are "intangible", some scholars classify them as intangible assets, and then use historical cost measurement as intangible assets. Liu Yu (2014) believes that data assets should be classified as intangible assets and has different secondary accounts according to the different sources of data assets, but the primary accounts are all intangible assets [3]. Similarly, Yang Xun (2016) considers data assets as one of the intangible assets and the measurement method also uses the measurement of intangible assets [4]. Chen Zongzhi and Chang Xin (2016) also suggest that data assets can be recognized as intangible assets [5]. Some other scholars believe that data assets are different from intangible assets and cannot simply be classified as intangible assets. Li Yaxiong and Ni Suan (2017) suggest that a separate accounting account of "data assets" should be set up to account for data assets [6]. Zhang, Junrui and Guiyanlin et al. (2020) also proposed to set up a separate account of "data assets" for data characteristics and further set up secondary accounts to account for data assets of different purposes [7]. Yazhen Ye, Guohua Liu et al. (2018) proposed to first box data information into a set and then perform value assessment [8].

The value realization of data assets is always dependent on the business management model of the enterprise, a feature that differs from the identifiability of intangible assets, i.e., data assets lack independence. In addition, the value of intangible assets is often estimated at the end of the research and development phase and is more stable, while the use of data assets can bring a surge in profitability to the enterprise. If data assets are recognized as intangible assets, the cost recognition process only reflects the acquisition and processing costs incurred, which are significantly underestimated compared to the excess revenue generated, thus affecting the reasonable use of financial information by decision makers. Finally, data assets are highly time-sensitive, and may be replaced by new data, resulting in a precipitous depreciation, or may increase in value very quickly due to updates or environmental changes, which shows that the value of data assets is volatile. At this time, if data assets are

accounted for as intangible assets, i.e., cost measurement and amortization, the value of data assets cannot be accurately reflected, which will affect business decisions.

4.2. Present value

Present value is a measurement attribute based on the value of assets. Theoretically, present value measurement can reflect the size of the value of data assets by estimating the present value of future net cash flows of data assets, and the value reflected in this way is more accurate and true, but for data assets, which are a special form of assets, their value estimation is extremely subjective, and enterprises cannot accurately use money to estimate the future profitability of data assets, therefore, in the recognition process of data assets, present value measurement will have large errors and is not applicable to the measurement of data assets.

4.3. Replacement cost

Replacement cost is the amount of cash or cash equivalents that would be paid to reacquire an asset under current market conditions. However, the value of data assets fluctuates frequently and dramatically, and it is extremely difficult to find the same asset again in the market, therefore, the replacement cost measurement is also not applicable to the accounting of data assets.

4.4. Net realizable value

Net realizable value tends to account for assets that are held for sale, such as inventory, while data assets are assets held by an enterprise and used for its own use; therefore, net realizable value measurement is not applicable to the measurement of data assets.

4.5. Fair value

Fair value measurement is a measure of the price that a market participant would receive to sell an asset or pay to transfer a liability in an orderly transaction date occurring on the measurement date. Fair value measurement reflects the gain or loss of the asset held due to market price fluctuations, which is appropriate for the volatility of data asset values and provides a more complete picture of the economic benefits that can be derived from data assets. In addition, fair value measurement reflects the market value of assets, which is more objective and can reflect the true value of data assets dynamically, and can reflect the value fluctuation of data assets in a timely manner. Based on the theoretical basis of decision usefulness view, fair value measurement is more conducive to the decision making of information users and makes up for the deficiency of historical cost in this regard. Therefore, this paper believes that it is more appropriate to adopt fair value to measure big data assets.

4. Suggestions and Countermeasures

In the context of the digital information era, digital resources are releasing powerful kinetic energy to help enterprises enhance their efficiency, and digital assets are playing a huge economic role. Therefore, enterprises should make good use of digital resources to help them achieve growth and development.

First, the definition of data assets should be clear. Different from the traditional enterprise assets, the value of data assets fluctuates greatly and is difficult to estimate. It is necessary to combine the characteristics of their attributes, define the concept of data assets well and unify the standards, so as to enhance the utilization and circulation of data assets. Second, the mining and identification of data assets should be reasonable. Whether data resources can enter accounting, recognition is the key. On the basis of the definition, the recognition of data resources should be standardized in combination with relevant regulations to ensure that data assets are accurate and true in accounting. Finally, the measurement of data assets should be accurate. In view of the characteristics

of data resources, in the estimation of their value, it is often difficult to estimate, subjective and other problems, therefore, when evaluating data assets, it is necessary to choose a suitable measurement method to reflect the value of data assets more realistically and ensure the reliability of accounting information.

References

Gartner. Big data [EB/OL]. http://www. gartner. com/it-glossary/big data/, 2013.

Manyika J, Chui M. Bigdata: The next frontier for innovation, competition, and productivity [R]. produktivitet [R]. Mckinsey Global Institute, 2011:1-137.

Liu Y. An overview of the recognition and measurement of big data assets [J]. Business Accounting, 2014, No. 546(18):3-4.

Yang Xun, Zhou Yu. Feasibility analysis of data asset accounting [J]. Cooperative Economics and Technology, 2016, No. 543(16):151-153. DOI: 10. 13665/j.cnki.hzjjykj. 2016. 16. 071.

Chen Zongzhi, Chang Xin. A study of big data assets into accounting statements of big data enterprises [J]. Economist, 2016, No. 331(09):112-113.

Li Yaxiong, Ni Suan. Research on accounting recognition and measurement of data assets [J]. Journal of Hunan Institute of Finance and Economics, 2017, 33(04):82-90. DOI:10. 16546/j. cnki. cn43-1510/f. 2017. 04. 011.

Zhang Junrui, Jiang Yanlin, Song Xiaoyue. Research on the accounting treatment and information presentation of enterprise data assets [J]. Accounting and Economic Research, 2020, 34(03): 3-15. DOI:10. 16314/j. cnki. 31-2074/f. 2020. 03. 001.

Paoloni M, Coluccia D, Fontana S, et al. Knowledge management, intellectual capital and entrepreneurship: a structured literature review[J].Journal of Knowledge Management, 2020, aheadof-print(ahead-of-print).DOI:10.1108/JKM-01-2020-0052.