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Big Data Asset Valuation of Internet Enterprises —Case Study of Netease Company

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Abstract: With the continuous development of Internet technology, big data assets, as an intangible asset, have become an important strategic material of enterprises, playing an increasingly important role in enterprise decision-making and operation. With the development of enterprises, the number and types of big data are also increasing, and the opportunities for big data to generate value are also increasing. In order to improve the value of big data assets, most enterprises gradually pay more attention to big data assets. In order to solve the ensuing problem of big data asset evaluation, this paper studies the data asset pricing method based on the analysis of the characteristics of Internet enterprise big data evaluation, citing the present value of income method, market value method and replacement cost method. The analytic hierarchy process (AHP) is applied in practice to construct the judgment matrix of evaluation index system and calculate the weights of each item. This paper takes the big data asset evaluation of Netease Internet enterprise as a case study to study the construction and application of the big data asset evaluation model of Internet enterprise.

Keywords: *Data assets, Evaluation index system, Valuation model, Value Assessment*

I. INTRODUCTION

With the widespread spread of the concept of Internet finance, more and more people or enterprises begin to advocate the Internet finance industry. In such a big development trend, its own strength is constantly enhanced, the relevant system is gradually improved. Internet financial institutions mushroomed, pushing China's economy forward a big step .Additional, more and more netizen becomes the latent force that promotes Internet economy to stride forward silently [1].

We can refer to the data directly or indirectly owned and controlled by an enterprise as assets. But now many enterprises lack the importance of data assets, not to mention the establishment of data measurement and evaluation system. At present, except for some enterprise whose core competitiveness is big data services, most of them think that data may be used as assets [2].

Big data assets appear in the form of a new thing, which needs to go through a process from research to exploration and finally to perfection. In recent years, due to the rapid development of digital economy, data plays an increasingly important role in economic society, but the academic circle lacks research on it at present. The value generated by big data assets is used by enterprises and local governments to create

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significant economic benefits. There is no doubt that Internet enterprises with big data as the core are in a leading position in the industry [3].

In January 2016, Guiyang established the first big data asset evaluation laboratory in China, and after Guiyang created the first one. Then Shanghai, Yancheng, Wuhan, Xuzhou, Beijing, Chongqing, Harbin and other cities followed. Big data is mainly concentrated in the government, Internet, finance and various industries, and has spawned a trillion yuan industry. According to the 2015 China Big Data Development Survey Report, the size of China's big data market reached 11.59 billion yuan, with a growth rate of 38%.In such a huge market, local governments and big data enterprises are seeking business opportunities in big data technology and service industries. According to statistics, there are more than 400 self-proclaimed big data enterprises in China at present, among which only more than 50 have received financing, and few have received large financing.

At present, many enterprises and governments have a lot of data, but these are just fake. Real big data is formed through calculation, evaluation and other processes. The fledgling lab got its first big case from The People's Daily to evaluate its "communication effectiveness evaluation system". In the process, the market pricing method is used to analyze and evaluate its various dimensions. The evaluation results show that the system is expected to generate hundreds of millions of dollars of economic value from users across the country.

In addition, big data not only brings practical benefits to domestic enterprises, but also brings benefits to foreign enterprises. McKinsey once conducted an assessment for big data, which concluded that big data saved 200 billion euros in costs and 40 billion euros in economic growth for developed European countries and the European Union. It reduces the cost of American healthcare industry by more than 300 billion dollars every year, and makes the foreign financial industry develop rapidly.

As data owners need to consume resources and are expected to bring economic benefits through various acquisition channels, making it conform to the definition of assets and intangible assets in Accounting Standards for Business Enterprises - Basic Standards, big data needs to be capitalized and evaluated as intangible assets.

II. LIRERATURE REVIEWS

2.1 Research on big data asset valuation model

Zhu and Ni [4] pointed out that in the current big data environment, data assets become an important asset, its public degree reached an unprecedented height, to facilitate data assets management theory research and practical development of the operation for the purpose, must be comprehensive combing and analyzing the research status and hot topics. Taking journal papers of data asset research as samples, the paper features, references and authors are analyzed, and the existing research materials are summarized and analyzed.
Zhang et al [5] pointed out that big data asset is playing an increasingly important role in the daily operation of enterprises. Companies must give due attention to big data, in order to achieve the improvement of business value. In this paper, the composition and influencing factors of big data assets are combined with the weights of various evaluation indicators of data assets to build relevant models for the value evaluation of big data assets.

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Li and Zhang[6] pointed out that big data has gradually become a driving force for enterprise transformation. The formation of big data is the data that can bring economic benefits to enterprises after a series of processing of original data. In this paper, we use ahp and GREY relational analysis to determine the comparable assets, modify the market method, build a model and determine the value of data assets.

Si[7] pointed out in the research on the value evaluation model of data assets in Internet enterprises that since the release of the Big Data Industry Development Plan, local governments and enterprises have accelerated the development of big data assets to achieve accurate profits. However, in such an Internet context, the pricing strategy of big data is still being explored, and the public attaches great importance to how to determine the value of big data assets. Based on the existing research, this paper sorts out and analyzes the big data of Internet enterprises, and constructs a model suitable for the value evaluation of Internet enterprises.

Dong and Guo et al[8] pointed out in the value evaluation model of data assets based on profit maximization that "data is valuable and will become an economic commodity", which has been widely accepted. However, there are differences between data assets and intangible assets in competition. Based on the analysis of commodity value and evaluation methods, the model is further constructed and the method is finally proposed.

Li[9] pointed out that the era of big data has many characteristics. In addition, the global data output value is developing at a high speed, so we need to strengthen the analysis and extraction of big data information, and give play to the advantages of computers and statistical models to build a sound asset evaluation database and information management system.

Wu[10] pointed out that the development of information technology leads to big data is not only an academic word, but also a commodity name. In order to solve the availability and commercial value of big data, combined with the 4V characteristics of big data, based on the probability model of big data characteristics, the algorithm of realizing block sampling of big data and the algorithm of big data value estimation are proposed.

Jiang[11] pointed out that why the big data value can become an important object of study has become the social public issues of concern, this article through to big data trading pattern, risk valuation, property rights define discussion research, such as the three major traditional evaluation method combined with various evaluation index, to analyze the risk of big data assets valuation, build large data assets value assessment framework.

2.2 Research on big data asset evaluation methods

Wang [12] pointed out that data assets, as a branch of intangible assets, have become important strategic materials for enterprises. In order to promote the application of data assets in the company and solve the difficult problem of data enterprise valuation, this paper puts forward the game method and artificial intelligence method for big data evaluation research on the basis of the three traditional evaluation methods.

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Le and Liu et al[13] pointed out that in the current era of popular data, data assets appear in front of enterprises in a new way, but the non-quantification and uncertainty of big data assets lead to inaccurate evaluation. This paper draws lessons from the three traditional evaluation methods and combines the existing evaluation model to test through actual cases.

Zhang[14] pointed out that in order to make enterprise big data valuation more efficient and scientific, this paper constructs a value model based on enterprise customer valuation by analyzing various customer valuation indicators.

Lin[15] pointed out that with the continuous development of the Internet, big data assets, as its derivatives, bring enormous economic benefits to enterprises and are widely concerned by the society. Based on the literature review, this paper combines the insights of domestic and foreign scholars on big data and evaluation methods, and finally reaches the research prospect.

Zuo and Teng[16] pointed out that with the development of big data trading market, big data asset price management has attracted the attention of all parties in society and become an important problem to be solved by all parties. Because of the new and complex form of its assets, the traditional evaluation method has met various difficulties in its evaluation, so the method based on user perceived value and case analysis are proposed to verify its feasibility and rationality.

Zhao and Li[17] pointed out that big data has become a national development strategy, and big data asset pricing problem has been research hot spot in academic circles, the first comb the literature at home and abroad were reviewed, analyzed factors that influence the big data pricing to use traditional evaluation methods to build on the basis of the price range of the theory of the large data assets of the three sections of the bargaining model, calculate the final equilibrium price.

Ma and Pan[18] pointed out in the analysis of the application of big data assets in the field of asset appraisal; The development of big data technology has brought changes to the asset appraisal industry. By analyzing the impact of big data technology on traditional appraisal methods, this paper studies the problems that big data may face and proposes countermeasures in the field of re-asset appraisal based on big data technology.

Lin[19] pointed out that big data, as a derivative of the current era, is a potential driving force of enterprise economic interests. After the research and analysis of a variety of evaluation methods, this paper finally determines the best method of big data value evaluation as cost method, and gives relevant steps.

2.3 Research on big data asset evaluation of Internet enterprises

Luo and Xu et al[20] pointed out that there are many problems in power enterprise at present, such as irregular management and disorder. Therefore, we need to combine the relevant research results at home and abroad with the background of big data, and on the basis of the analysis of electric power enterprises, obtain methods, build a panoramic view of data, quantify the data, and propose management methods.

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Li and Li[21] pointed out in the research on the evaluation methods of data assets of Internet enterprises that at present some enterprises pay more attention to big data assets in the operation process, but there are still few researches on data assets and their value in China. Therefore, this paper adjusts the applicable conditions of traditional valuation methods by studying data assets, laying a good foundation for future theoretical research and practical application.

Shi and Gao[22] pointed out that the society and enterprises should pay more attention to the data assets. In this paper, based on the existing research, combined with the characteristics of big data, the system model is constructed, and finally the evaluation framework is proposed.

Wang and Wang[23] pointed out that: in the study of this paper to improve the data value of the asset and its intrinsic value in the enterprise development, using the Internet to enterprise operation features, on the basis of constructing evaluation index system of enterprise data assets influence, through B - S theory to conduct a comprehensive assessment, it is concluded that the data assets internal relation between influencing factors.

Bi[24] pointed out in the research on the valuation strategy of data assets of Internet financial enterprises that network data has become an indispensable part of the Internet era.It is not only beneficial to the public's living needs, but also brings huge economic benefits to enterprises. Taking Internet financial enterprises as the breakthrough point, this paper studies the valuation methods of data assets and forms the valuation of big data assets.

Niu[25] pointed out that with the development of big data among enterprises and more and more attention is paid to it, we should comply with the trend of The Times and use big data to protect the legal rights of the right holders more effectively.

Song et al[26] pointed out that effective management of enterprise big data asset value evaluation can better promote the improvement of enterprise data asset input-output level. This paper constructs EDAV index system and model system to provide ideas and reference for EDAV evaluation.

In the context of the Internet, the society lacks emphasis on big data assets, so it is necessary to strengthen the research on data asset evaluation. In this paper, the method of data asset pricing is studied by the method of present value of income, market value and replacement cost. The basic research method is analytic hierarchy process (AHP), which takes the construction of evaluation system, judgment matrix and weight as the process, and the construction of asset evaluation model as the target.

III. INFLUENCING FACTORS OF ENTERPRISE DATA ASSET VALUE

The risk factors affecting the application value of existing data enterprise assets are mainly considered from two main dimensions: risk return and application risk of existing data application assets[27]. The risk return of data application assets mainly depends on the technical quality and practical application value of existing data application assets. The security and quality stability of data center assets is an important basis for realizing application value.

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3.1 Data Asset Quality Value Dimension

The quality value of data assets includes authenticity, integrity, accuracy, data cost, security and so on[28].

Integrity refers to the integrity of data on all related metrics of a record object. Missing critical data can affect the value contribution of the data to the application or increase the cost of completing the data. The higher the integrity is, the greater the data value is.

Accuracy recording generally refers to the overall accuracy of data in the process of data recording. In the work, the current analysis data must be divided into clear outliers, blank data values, invalid data values, double values and so on. This new work process is expected to take almost half the manpower time of the entire data analysis process. The emergence of full-time "data sweeper" also fully demonstrates the high complexity of enterprise data resource cleansing. The higher the application accuracy of data, the lower the application cost of data resource cleaning is, and the greater the application value of data is.

Data processing costs. If a data analysis market is not active, there is no clear way to calculate the value of the data and calculate the analysis. The seller's quotation for the sale of customer data will first need to consider the transaction cost of buyer data. Data collection methods are usually collected internally or outsourced. For data generated and collected internally, explicit costs include, in particular, the cost of work and storage equipment. Intangible costs that cannot be reliably measured in the survey and attitude procedures are mainly research and development costs and wage amortization of the companies attached to the data. The higher the purchase cost, the greater the transaction value of the data.

Security refers to the ability not to steal or corrupt data. The higher the information security value of data itself, the more stable the contribution to the interests of an enterprise; At the same time, the higher the cost of the data asset holder's personal data protection asset, the greater the protection value of the data asset.

3.2 Application Value Dimension of Data Assets

The key factors that affect the overall dimension of information application and the overall application value of big data information assets are information scarcity, timeliness, multi-dimension, scene and economy[29].

Scarcity represents the extent to which data owners monopolize data. The essence of competition in the commercial market is the fierce competition for scarce resources. As the production difference flattens, the underlying business message behind scarce resources highlights their value. The timeliness of the data determines whether the decision is valid over time. Multidimensionality can represent the diversity of network data coverage. The more dimensions of data, the greater the scope of data, the greater the value. Scenarios are economical, and the economic value contribution of data lies in the close combination with the enterprise application economy scenarios. In different enterprise application economy scenarios, the value contribution of data to the scenario economy is different. For example, the economic value of transportation information used by logistics companies is greater than that of transportation information used in individual travel scenarios.

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There is also a dimension of risk, which is hard to measure[30]. The risks of data assets mainly come from the legal and ethical constraints in their operating environment, and the quantitative impact of data assets on quality changes. These factors should be fully considered when evaluating the value of data assets. If the law does not specify which data can never be traded and which data can only be traded after design. These issues not only limit data traffic but also the value of data values, with the practical effect, of course, of correspondingly increasing tighter regulation of data transactions, compliance costs and security costs for both parties. Although data compliance and security industry as side effects will have development space, but it will have a significant impact on the development of the whole data wealth market, will affect the overall development of digital economy, development and the concept of tolerance should be used, given the data exchange the introduction of laws and regulations or the drafting of the classical decision may affect the value of related data items, from quantitative change to qualitative change. Moral pressure constraint risk is generally refers to the moral risk that the society is under great public pressure. If the user company illegally abuses the personal data of other users and does not respect the personal privacy of other users, it will seriously affect the corporate brand image of the user company and its confidence in customer service, and have a significant negative impact on the use value of personal data and the development of its business value to the company.

IV. DESIGN OF INDEX SYSTEM FOR BIG DATA ASSET VALUE EVALUATION OF INTERNET ENTERPRISES

4.1 Index Levels of Big Data Asset Evaluation

(1) Big data quality value and evaluation

Big data quality is the extent to which big data can meet the specific needs of business scenarios under the premise of meeting the consumer's purpose of use in an economic environment. Consumers have different requirements for the quality of big data in different business scenarios. Some people pursue the real-time performance of big data, while others pursue the accuracy of big data. So, as long as the data meets the consumer's purpose, it can be said that the quality of the big data meets the requirements. As the data did not meet the expected quality, we judged the integrity, correctness, consistency and repeatability of the data quality assessment.

Integrity Q1: Refers to the state of whether big data is missing, including the missing of the whole big data record or the missing of a certain field information record. The integrity of big data is the most basic evaluation standard of big data quality, which determines whether the big data can be used for reference.

Correctness Q2: Refers to whether big data is abnormal or has errors. Common big data errors include garbled characters and abnormal data size. The accuracy of big data quality can occur in individual records as well as in entire data sets.

Conformance Q3: Whether the data is performed to a uniform standard. The consistency of big data quality depends on whether the recording of big data is standardized and whether big data is logical.

Repeatability Q4: Data may be recorded twice. In reality, a subject may have incorrect expressions because of grammatical or other differences, leading to different expressions to describe the same subject, leading to repetition of the subject.

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(2)Application value and evaluation of big data

In marketing, big data plays an important role that cannot be ignored. In addition to providing conversion strategies, sales forecasts, revenue growth and customer life cycles, it helps us determine what is most effective at each stage of the sales cycle and how to improve our CRM system. If a company is providing cloud-based enterprise software services, big Data can also provide information on how to reduce customer acquisition costs (CAC), customer lifetime value (CLTV), and manage many other customer-driven metrics that are critical to running a cloud business.

Big data has many advantages, such as large capacity, wide types, fast data reading speed and high application value, etc. Big data was first applied to the IT industry, and also rose in the IT industry. The application value of big data includes scarcity (A1), timeliness (A2), multi-dimension (A3) and scene value (A4). See Table 4.1.

Table 4.1 Index system of data value evaluation

Level indicators	The secondary indicators
Data Quality Value (Q)	Integrity (Q1)
	Correctness (Q2)
	Consistency (Q3)
	Repeatability (Q4)
Data Application Value (A)	Scarcity (A1)
	Timeliness (A2)
	Multidimensionality (A3)
	Scenario Economy (A4)

4.2 Determine and judge the quantitative scale and meaning

For the calculation of different index weights, the expert scoring method is used to compare with each other.In the process of comparing the two factors, a definite scale is needed, and the scale method in Table 4.2 is adopted.

Table 4.2 Determining quantitative scale

scale	meaning
1	Represents two factors of equal importance
3	Refers to two factors in which one is slightly more important than the other
5	Represents two factors in which one factor is significantly more important than the other
7	Refers to two factors in which one is more strongly important than the other
9	Refers to two factors in which one is more important than the other
2,4,6,8	The median value of the above adjacent judgment

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(1)Big data quality judgment matrix and weight

Expert scoring method: Compare the importance of big data in pairs to build a judgment matrix of big data quality.

Table 4.3 Big data quality judgment matrix

	integrity	correctness	consistency	repetitive
integrity	1	1	3	5
correctness	1	1	3	5
consistency	1/5	1/3	1	3
repetitive	1/5	1/5	1/3	1

Weight determination: According to the judgment matrix, calculate the weight of big data quality.

Table 4.4 Weight of big data quality

Level indicators	The secondary indicators	The weight
Big Data quality	Integrity (Q1)	W1 = 0.32
	Correctness (Q2)	W2 = 0.32
	Consistency (Q3)	W3 = 0.21
	Repeatability (Q4)	W4 = 0.15

(2)Big data application value judgment matrix and weight

Expert scoring method: Compare the importance of big data in pairs to construct the value judgment matrix of big data application. As shown in the following Table 4.5.

Table 4.5 Big data application value indicator judgment matrix

	scarcity	timeliness	Multidimensional nature	Scene economy
scarcity	1	1/3	1/5	1/9
timeliness	3	1	1/3	1/3
Multidimensional nature	5	3	1	1/3
Scene economy	9	3	3	1

According to the judgment matrix, the weight of big data application value index is calculated. As shown in the following Table 4.6.

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Table 4.6 Index weight of big data application value

Level indicators	The secondary indicators	The weight
Big data application	Scarcity (A1)	W1 = 0.08
	Timeliness (A2)	W2 = 0.14
	Multidimensionality (A3)	The W3 = 0.22
	Scenario Economy (A4)	W4 = 0.56

V. VALUATION METHODS AND SELECTION OF INTERNET ENTERPRISES' BIG DATA ASSETS

5.1 Basic Methods of Asset Valuation

The basic methods of asset appraisal include: market method, income method and cost method.

5.1.1 Market method:

(1)There are active comparable markets:

(2)There is a reference in the market with a short time interval between the transaction time and the appraisal base date and comparable to the assets being evaluated;

(3)No fewer than three references should be selected, and the data should be authentic and the result of normal transactions.

5.1.2 Cost method:

(1)The physical characteristics, internal structure and functions of the assessed asset must be comparable to the hypothetical new asset;

(2)The use of cost method is based on available historical data;

(3)There will be some necessary wear and tear;

(4)The assessed asset creates an economic benefit for those who own or control it during its ongoing use.

5.1.3 Revenue Method:

(1)Monetary measures can be used to predict future expected returns;

(2)Be able to predict and use monetary measures to achieve the expected return risks;

(3)The expected profit life of the assessed assets can be predicted.

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5.2 Application Analysis of the Valuation Method of Big Data Assets of Internet Enterprises

(2) Forest stock conversion factor method

Due to the uncertainty and non-quantification of data assets, the three basic methods of asset appraisal are not completely applicable, so the three traditional methods are especially innovative and applied. See Table 5.1.

Table 5.1 Summary of basic methods and innovation points of big data asset valuation

category	Core formula and symbol description	Innovation and application
Market Method	$V_0 = \frac{1}{m}\sum_{i=1}^{m} W_i V_i$ The V_0 Represents the price of big data asset to be evaluated, Vi represents the price of the ith comparable big data asset, m represents the numbers of comparable big data assets, Wi represents the adjustment coefficient of the ith comparable big data asset.	Added big data buyer use feature correction to the market method formula. The higher the requirement of buyer analysis technology capability and use value, the greater the use characteristic correction coefficient .Otherwise, the correction coefficient of big data usage characteristics will be lowered.
Cost Method	$V_0 = \sum_{i=1}^{m} f_i \alpha_i$ The V_0 Represents the price of big data assets to be evaluated; α_i represents the combination coefficient; f_i represents the price of the ith cost factor (part of big data assets) in the big data assets to be evaluated.	If f represents factor price, portfolio coefficient α_i =1; if f represents part of big data asset price, portfolio coefficient α_i>1 when each part of big data asset portfolio increases in value; otherwise, α_i<1 or α_i=1
Revenue Method	$V_0 = \sum_{i=1}^{m} \frac{R_i}{(1+r)^i}$ The V_0 Represents the price of the big data asset to be estimated, Ri represents the future earnings of the big data asset to be estimated in the ith period, r represents the discount ratio, m represents the numbers of the earning periods.	When determining the objective income and income, the buyer's ability to analyze large receipts and its influence on the use value should be fully considered, and the relevant parameters should be reasonably determined

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VI. CASE STUDY ON BIG DATA ASSET VALUATION OF NETEASE COMPANY

6.1 Company Profile

Netease (NASDAQ: NTES), founded by Founder and CEO Ding Lei in Guangzhou in 1997, was listed on NASDAQ stock Exchange in 2000. It is a leading Internet technology company in China. In Internet applications, services and other technologies, it has always been in a leading position in the Chinese industry. With the purpose of promoting the rapid development of Chinese Internet enterprises, Netease promotes the exchange and sharing of information among people by virtue of advanced technology.

Netease has a wide range of business, including websites, games, email, music and other major aspects. The headquarters project of Netease in Guangzhou Tianhe Smart City is scheduled to be completed in January 2019, and Netease Game headquarters will settle in. In 2016, game business revenue accounted for 73.3% of Netease's total revenue. In 2011, Netease Hangzhou Research Institute was launched. Netease Media is in Beijing. Netease has launched Netease Kaola.com, Netease Cloud Music and other projects in Hangzhou.

Netease's annual financial report shows that its annual net income in 2019 was 59.24 billion yuan; based on non-US GAAP, net profit attributable to shareholders of Netease from continuing operations is 15.66 billion Yuan.

In 2019, Netease made major breakthroughs by deepening its strategic focus, sticking to the content consumption field and actively laying out core tracks such as games, education, music and e-commerce. While maintaining steady growth, Netease Youdao, Chuangxin and other business sectors have exploded with strong potential, providing continuous momentum for long-term development in the future.

6.2 Selection of Netease's value evaluation model

Netease is an asset-light Internet company, and its big data is of great importance to it. Because cost method is the evaluation of tangible assets, it is not suitable for the value evaluation of Netease.

Although under the influence of the Internet + era, more and more Internet enterprises have appeared one after another, but the real listed companies are few, and each has its own development model. At present, can find in the open market with the game development as the core competitiveness and annexation of the website development of Netease Company has been very little. Although there are crossover points in business model with Sina, Weibo, Sohu and other companies, the core competitiveness is still very different from each other, so we can only use the market method in a wide range to make comparative analysis with a few enterprises.

Option pricing is a new pricing model that includes option value, which can broaden our thinking. It has a great advantage in the evaluation of high-risk companies. However, although Netease has been listed for a short time compared with most traditional enterprises, its financial statements show that its revenue and profit have set new highs one after another, and it is developing at a high speed. Cash flow discount method

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is a kind of valuation method that can accurately evaluate the value of a company, especially for Netease, an Internet enterprise in the stage of rapid development, which has great advantages. Therefore, in this case, the free cash flow model will be adopted to evaluate the value of Netease.

6.3 Evaluation of Netease's big data assets

The free cash flow model is adopted to evaluate the value of Netease:

Free cash flow = EBIT * (1- tax rate) + depreciation and amortization - increase of non-cash working capital - capital expenditure

(1)Table 6.1 and Table 6.2 can be found out according to the financial statements of Netease from 2010 to 2020.

Table 6.1 Forecast of Depreciation and amortization and Capital Expenditure of the Company from 2010 to 2020 (unit: THOUSAND Yuan)

The annual	Depreciation and amortization	Percentage of net revenue	Capital spending	Percentage of net revenue
2009	143580	3.82%	566269	15.07%
2010	232171	4.22%	244614	4.44%
2011	293419	4.00%	330096	4.50%
2012	374561	4.00%	702303	7.50%
2013	472895	4.00%	1891578	16%
2014	660893	4.50%	734325	5%
2015	796531	4.50%	885035	5%
2016	1047225	5.00%	1675559	8%
2017	1215488	5.00%	3403367	14%
2018	1362612	5.00%	1635134	6%
2019	1620451	5.50%	1767764	6%
2020	1703634	5.50%	2787764	9%
Termination of the year	1914093	6.00%	3828186	12%

Table 6.2 Forecast of non-cash current assets and liabilities during 2010-2020

The annual	Proportion of non-cash current assets	Ratio of non-cash current liabilities
2010	22.30%	24.54%
2011	22.30%	28.61%
2012	22.30%	28.61%
2013	22.60%	28.70%
2014	22.60%	28.70%
2015	23.00%	28.80%
2016	23.00%	29.80%

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2017	23.50%	29.90%
2018	23.50%	29.90%
2019	24.00%	30.00%
2020	24.00%	30.00%
Termination of the year	26.00%	31.30%

(2) According to the above data, forecast the free cash flow is as in Table 6.3.

Table 6.3 Free Cash Flow Statement (Unit: THOUSAND RMB)

The annual	business income	ebit profits	Income tax	EBIT * (1 - t)	Depreciation and amortization	capital spending	Increase or decrease in non-cash flow capital	free Cash flow
2010	5507669	2576471	344446	2232025	232171	244614	80157	2299739
2011	7335475	3434415	515162	2919253	293419	330096	343375	3225951
2012	9364034	4375805	656371	3719434	374561	702303	127906	3519599
2013	11822363	5227962	784194	4443767	472895	1891578	130888	3155972
2014	14686507	6245597	936839	5308757	660893	734325	174750	5410074
2015	17700698	7422105	1113316	6308789	796531	885035	130802	6351088
2016	20944492	7846759	1177014	6669745	1047225	1675559	397627	6439037
2017	24309765	8498353	1274753	7223600	1215488	3403367	131643	5167364
2018	27252237	9927765	1489165	8438353	1362612	1635134	188356	8354434
2019	29462740	9382187	1407328	7974859	1620451	1767764	23650	7851195
2020	30975155	9854705	1478206	8376499	1703634	2787764	90764	7383133
Termination of the year	31901548	6785226	1696307	5088920	1914093	3828186	167715	300711

(3) FCFF valuation. See Table 6.4.

Table 6.4 FCFF valuation table

WACC	8.03%(Second growth stage)
Sustainable growth rate	3.00%
Discounted cash flow (thousand yuan)	17307633
Final value (tens of millions)	27392120
Company value AVE (thousand yuan)	44699753
+ Non-core asset value	9479109
- Minority equity	17173
Net debt	0
The value of the company	54196035
Usd/RMB exchange rate	6.60
Weighted average Of American Depositary Receipts, Basic (thousands)	129857.04
Value per share (US $)	63.24

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According to the evaluation model in this paper, we can conclude that the value of Netease Internet enterprise is 54.5 billion yuan, and the value of each share is $63.24 based on the current weighted average of 1.299 billion American depositary shares and the current RMB exchange rate of 6.60.

VII. CONCLUSIONS

In the current financial context, big data assets have become an indispensable asset for every enterprise. Big data assets can not only bring economic benefits to enterprises, but also promote the development of national economy to a certain extent. However, only a small number of enterprises with data as their core competitiveness attach great importance to data, and most of them lack of attention to data.

With the establishment of the first big data asset evaluation center in Zhongguancun and the first big data asset evaluation laboratory in Guiyang, it shows that governments and enterprises in many places have gradually begun to pay more attention to big data asset evaluation.

Although this paper takes Netease as a case to estimate the business growth of the enterprise, its Internet products are updated at a fast speed, and various situations may occur in the future, which is difficult to predict. As an Internet enterprise, the growth and sustainability of the company's value are not only determined by its financial statements. Due to the limited conditions, the influence of other factors such as human intelligence on the company is not taken into account. For the prediction of discount rate, the risk-free rate is mainly for the macro environment. As for the estimation of beta value, due to the limited data and short selection period in this paper, it may cause deviation to the company's valuation.

The asset appraisal industry should establish a complete big database and perfect the big data appraisal system. Local governments and enterprises should attach great importance to big data; Marketization of data assets to promote the development of relevant commercial industry chains; Strengthen talent training for big data evaluators.

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