

# Improvement Path of Enterprise Economic Management in the Era of Big Data

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**Abstract:** With the development of big data (BD), the market environment is also changing, especially the advent of the big data era, which brings both development opportunities and development risks to enterprises. Under the mode of networking and digitalization, the economic management of enterprises must carry out active reform, keep in line with the development trend of the times, grasp the lifeline of the times, cope with the development challenges brought by BD, and maintain the development speed of the company. In this paper, the enterprise economic management and BD were firstly introduced respectively in detail, then the strategy of enterprise management in the era of BD and the current problems were proposed. Finally, the advantages of computer processing of massive data (the acceleration ratio is 1279.52% under processing 20G data set 2) was verified through the experiment of BD description and analysis system.

**Keywords:** Enterprise Economic Management, BD Era, Business Management, Data Processing

## 1. Introduction

In the economic operation of a country, enterprises are an indispensable link, and only the benign development of enterprises can further promote the development of the national economy. In recent years, along with the reform of China's economic system, each enterprise has encountered unprecedented opportunities and challenges. If the original business management system continues to be used without change, then there is bound to be a situation where the best can win and the worst can lose. Therefore, in the new economic environment, each enterprise is also constantly seeking solutions to problems and strengthening institutional innovation and reform.

For the improvement of economic management of enterprises, a large number of experts have made relevant studies. Kryshnanovych S used the integrated, analytical, deductive, inductive, mathematical, and expert research methods. The analysis of the current situation of the development and utilization of mountain tourism resources illustrates the importance of the development and utilization of mountain tourism resources. It is a special way of managing the social and economic development of mountainous areas with the aim of improving the operational efficiency of tourism. Through this study, various threats were identified, which have the worst impact on the management system of social and economic development of mountain areas. The innovation of the subject is the creation of a system of coordination of trust and distrust between managers and administrators of tourism companies [1]. In order to explore the theoretical approach to the definition of the economic substance of agricultural companies in the region, as well as the directions for the construction of economic security of agricultural companies in the region, Hmyria V proposed that in the current scientific context, the economic security of agricultural companies was considered a complex branching process, which is a method, an instrument, a lever for influencing the activity, the goal of which is to increase the efficiency of the economic activity of the entity. In this context, there are many disagreements about the components of economic security of the company. Practice showed that its formation and its use in agricultural production had their own characteristics in the territory. The Fawcett technological modernization model established by the research allows to better determine the impact of investments in agricultural companies, the tax burden on industrial and credit companies, on depreciation deductions, etc., which positively affects the business behavior of agricultural companies and, in turn, ensures their basic economic security [2]. Using a sample of UK publicly traded companies, Ahmed D examined the relationship between the social and environmental behavior of companies and the cost of equity capital through four ex ante measures. First, his study reviewed the currently available research

findings on the social and environmental aspects of firms. Secondly, through the "Social and Environmental Responsibility" survey of the "Best Companies in Britain", 236 companies were selected from 236 companies from 2010-2014 and four implicit costs of equity capital were experimentally assessed. On this basis, the cost of equity capital of the company was analyzed in relation to its social and environmental performance. The empirical results showed that the higher the degree of a company's social and environmental behavior, the lower the company's cost of equity capital. These findings help people to better provide users with valuable decisions. At the same time, it confirms the idea that socially responsible companies are less risky and more valuable [3]. Although the above-mentioned studies have made certain experiences of improving management effectiveness in different areas of business economic management, they are not universal.

At present, the era of BD is an irreversible trend in the development of enterprises, and it is being gradually applied in many industries in China. The combination of BD and enterprise management can also better promote enterprise development, as it can help enterprises save a lot of labor costs and ensure that business decisions are supported by sufficient data. However, some enterprises inevitably still face some problems in the actual implementation and coordination. If these problems can be solved, enterprises can be able to make better use of BD for financial management and daily operations, thus improving the overall corporate governance. The purpose of this paper is to investigate how to improve corporate governance in the context of BD.

## **2. BD Era and Enterprise Economic Management**

### **2.1. Enterprise Economic Management**

#### **2.1.1. Importance of Enterprise Economic Management**

In order to improve farmers' income, it is necessary to accelerate the exploration and innovation of economic management methods in order to ensure the systemic and effective economic management. Only through the innovation of economic management can the sustainable development of enterprises be ensured [4]. With the rapid development of China's national economy and the transformation of the economic growth mode, the business operation mode has also undergone profound changes [5]. In order to adapt to this change, it is necessary to pay more attention to economic management to adapt it to the changes in the market so that it can always remain on the track of sustainable development. After launching active management, companies can contribute to a more robust management system [6]. Economic management involves more aspects, it focuses not only on economic efficiency, but also on innovation and coordination, green, openness, etc. In order to make the enterprise more diversified and systematic, it is necessary to start the innovation of the enterprise economic management, so that the function of the enterprise economic management can be brought into play.

#### **2.1.2. Some Problems in the Economic Management of Enterprises**

##### **(1) Lack of advanced economic management concepts**

In the economic management of enterprises, the economic management concept has a direct impact on the effect of economic management. At present, the pace of China's social environment and market economy development has been accelerated, and the development of foreign enterprises in business management has also been accelerated [7]. However, the current management of Chinese enterprises is still in the original management ideas, which cannot keep up with the times and cannot adapt to the needs of the development of enterprises and constantly adjust and update management ideas. Under the current rapid development of social economy, enterprises must raise their attention to economic management ideas, recognize the defects in enterprise management ideas, and improve and update them so that economic management can play a greater role in the process of enterprise development and thus achieve sustainable development of the company [8].

##### **(2) Lack of clear division of management responsibilities**

Most enterprises nowadays have established special economic management departments, and although these economic management departments are fully staffed, in some enterprises, the lack of timely and effective communication and exchange has prevented the formation of a collaborative and mutually reinforcing relationship between departments. In particular, once an accident occurs, it is difficult for the company to conduct a thorough investigation, and the staff of each department often point fingers at each other, which is largely due to unclear responsibilities. On the other hand, some companies focus their management on expanding the market. Market and production and operation,

and neglect the management of finance, thus leading to the lack of economic management. Many management systems cannot adapt to the practical application of the enterprise, and the job responsibility system is not effectively implemented. This not only makes the business management of the enterprise inefficient, but also seriously affects the work motivation of employees. In the long run, it not only makes the internal management of the company lose control, but also makes the company produce corruption, and in serious cases, it makes the company bankrupt [9].

### (3) Backward enterprise economic management model

In the development of many enterprises in China, due to the traditional concept, it is easy to form a rough and loose way of doing business, and rarely change to an intensive way of doing business. However, with the development of today's market economy, the pressure faced by enterprises has become greater. Therefore, the economic management mode of enterprises inevitably has to gradually change to an intensive one. However, enterprises tend to ignore the important role of economic management, and are bent on capturing the market. Therefore, enterprises should break through the shackles of traditional thinking and take advantage of modern technology to carry out business activities in the process of operation. The management of talents in enterprises lacks scientificity and rationality [10]. Because some enterprises are lax in staffing and management, it causes a high turnover of personnel. After the departure of old employees who are familiar with business operation, new employees cannot fully adapt to the workplace in a short period of time, which affects the business efficiency and work quality of enterprises. Frequent staff turnover affects the cohesiveness of the team and causes emotional instability, which in turn reduces the motivation of employees.

## 2.2. BD

### 2.2.1. Introduction of BD

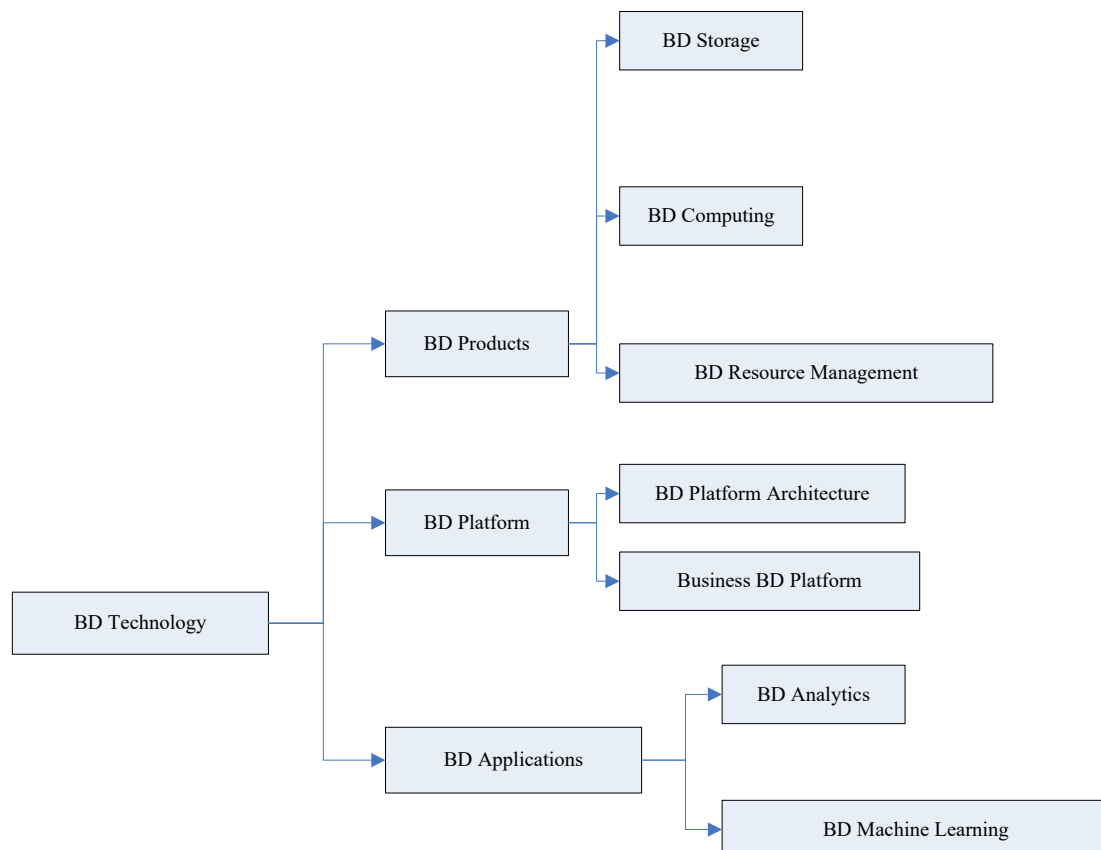


Figure 1: What is covered by the definition of BD.

The development of information technology has increased the use of big data [11-12]. Big data refers to the large amount of information and complex data generated by business activities, which together form a database [13]. Big data is heterogeneous, fast, high-value and contains a large amount of information. Big data stores a large amount of information, mainly in the form of high-value data sets, and is a symbol of business development [14]. Of course, the density of big data is not very high,

so it is not available to all organisations, despite its large volume. Big data is highly mobile and time-sensitive, so it is important to understand the structural characteristics of big data and also to understand the flow of big data. Big data includes not only data, but also web pages, text, geolocation, video, etc. Big data technology consists of three main parts: big data products, big data platforms and big data applications, which are further classified as shown in Figure 1.

### **2.2.2. Innovation Model of Enterprise Economic Management in the Context of BD**

(1) The difference between the innovation of enterprise economic management model and traditional innovation model in the context of BD

Traditional business management is based on the problems that exist in business, and is oriented to the problems that exist in business, so as to promote changes in business practices. It uses humanized management, institutionalized management, expert wisdom and organizational knowledge to carry out quantitative and qualitative analysis so as to seek ways to solve the problems existing in the economic management of enterprises and thus achieve innovation in the economic management of enterprises. However, under the background of BD, the environment and conditions of enterprise management innovation have become more complex and changeable, and the innovation methods, channels and approaches have become more abundant. In the BD environment, the external conditions and environment for business operation have changed dramatically, which has a great impact on the operation mode and operation effectiveness. In terms of driving factors, from traditional innovation based on management issues to BD driven based on data and innovation; From small data driven by organizational resources to BD driven environments; From "BD driven" based on "top-down", "decision tree" and "Delphi method method" to "small data driven" by "bottom-up", "networking", "statistical analysis" and other means. The success of traditional technological innovation depends on the professional knowledge and experience of technical personnel. The success of innovation in the BD environment depends on the availability of data and the accuracy of analysis results.

(2) Way of enterprise economic management innovation in the context of BD

In the context of BD, BD is the key to business change and the process of analysing and managing BD is key to solving BD related problems. There is a close link between the process of analysing and managing BD and the process of innovation. Therefore, in the background of BD, the innovation of enterprise economic management should be problem-based and data-based, and the data should be collected, and then these data should be imported into the data platform. After analyzing these data, the corresponding innovation decisions should be formulated and implemented, and in the implementation of In the process of implementation, these innovative solutions are continuously improved and perfected. At the same time, the data needs to be predicted and monitored in order to identify problems in time and provide reference for the innovation decisions of the company.

### **2.2.3. Effective Strategies to Strengthen the Economic Management of Modern Enterprises**

(1) Establishing sound and perfect enterprise economic management

In the establishment of a sound economic management system in the enterprise, the target is the enterprise workers, and it is necessary to ensure reasonable and effective regulation and restraint of their behavior, and to ensure that the enterprise workers carry out their work and activities better under the clear provisions of the management system [15]. The soundness of the enterprise economic management system and its continuous innovation and upgrading is an important basis for carrying out enterprise economic management. The management of all work of the enterprise requires the management's overall planning and the corresponding financial support. Many problems encountered in the design, production and marketing of the enterprise can be solved by a rational economic management system.

(2) Continuous improvement and adjustment of business organization structure

Detach from the traditional organizational form of the company and use BD to realize the unification of softness, virtualization and flatness. Flexibility means meeting the different demands of the downstream market under normal conditions, resisting fluctuations in the supply chain under abnormal conditions, and responding to actual changes in market demand with a flexible capacity at all times, making the company's supply chain more resilient, thus achieving complementarity and mutual support between different production sites [16]. Virtualization refers to the establishment of an internal resource utilization complex, which contains various resources needed to achieve the overall goals of the company's development, such as human resources, knowledge technology, and information data, etc. It uses communication network technology with BD as the main means to gradually break through the

traditional limitations and establish a learning organization that focuses on the common values and overall goals of all workers in the company [17-18].

People-oriented, pay attention to the enterprise because of people, the enterprise is essentially a group of people with certain advantages or strengths constituted, but also have certain shortcomings or defects, the task of enterprise managers is to make full use of their advantages, explore their potential, stimulate their vitality, and help them to overcome their own defects. The development of the knowledge economy has allowed enterprises to accumulate various human, financial resources, and information resources. It can be seen that the development and growth of enterprises are inseparable from the development of the knowledge economy. As a modern enterprise in the new era, firstly, it should use the knowledge economy scientifically and accumulate more knowledge power. Secondly, it should continuously enrich its cultural heritage and connotation. Finally, it should improve its actual production technology and increase the investment in human resources [19].

### 3. BD Enterprise Financial System Experiment

In order to test the stability of the enterprise financial data processing platform, two datasets are selected for the experiment. Dataset 1 was obtained from the cloud platform of Shanghai Wanda Information Co. In order to obtain more experimental data, the original data of both datasets were replicated. From these data, various traditional, autonomous and distributed descriptive statistical algorithms were tested and compared on the different datasets. In addition to comparing execution time, the currently popular metric EX (commonly referred to as acceleration rate) has also been calculated, which measures system scalability and architecture performance, as well as EF, which measures algorithm execution efficiency:

$$EX = \frac{T_s}{T_p} \quad (1)$$

$$EF = \frac{EX}{N} \quad (2)$$

Among them, EX denotes the acceleration ratio; T denotes the execution time in single machine serial mode; T<sub>p</sub> denotes the execution time in parallel mode; EF denotes the execution efficiency; N denotes the number of cores of CPU (Central Processing Unit) in the cluster.

Table 1: Table of experimental results.

Data volume	Serial execution time (s)		Parallel execution time (s)	
	Data sets 1	Data sets 2	Data sets 1	Data sets 2
10M	37	37	126	125
100M	83	82	211	208
1G	108	107	296	298
5G	1129	1130	585	584
10G	11296	11298	1134	1134
20G	19657	19659	1535	1534

As shown in Table 1, for a small amount of data, the execution time of sequential programs on a single machine is shorter than that of parallel execution, which makes the advantage of sequential computing more obvious, but as the amount of data increases, the execution time of sequential programs lengthens and grows exponentially, while the execution time of parallel execution becomes relatively much shorter, and the advantage of parallel execution becomes more obvious.

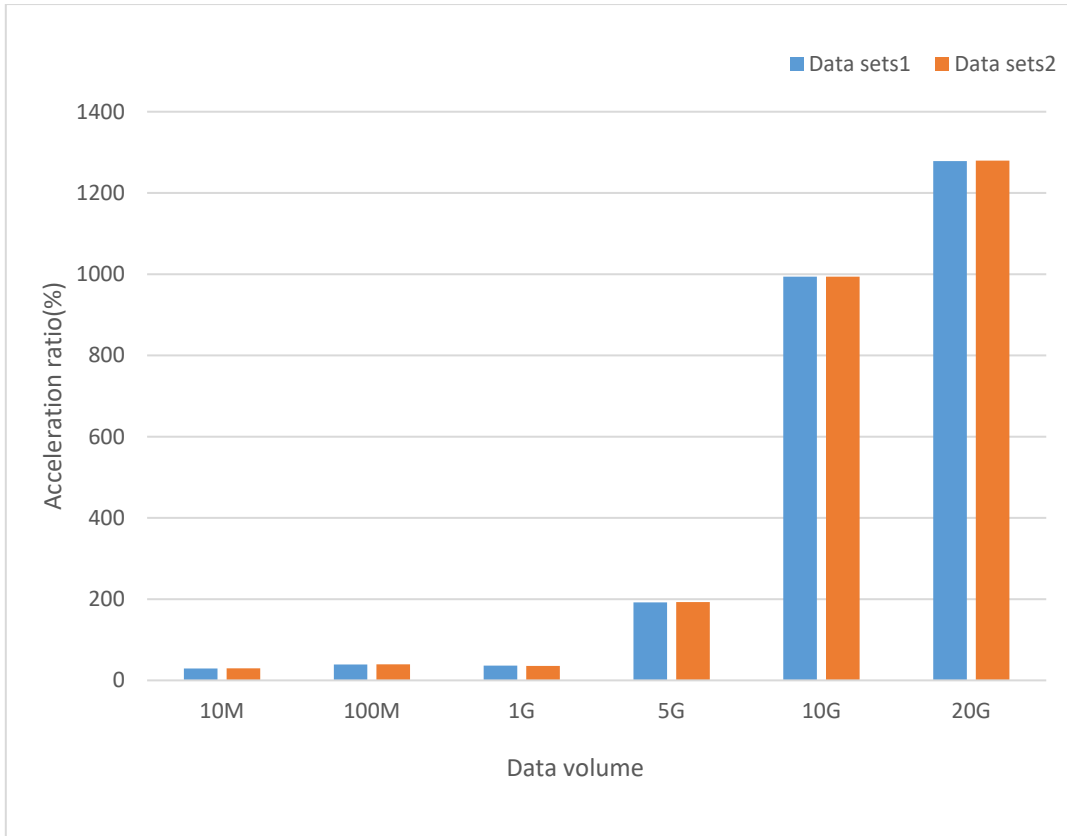


Figure 2: Comparison chart of acceleration ratio for different data volume.

As shown in Figure 2, the acceleration ratio of the system operation keeps rising along with the increase of data volume, and there is no difference in the increase of acceleration ratio for data sets 1 and 2. The system scalability and architectural performance have great advantages in handling massive data (because the larger the data volume is, the larger the acceleration ratio is).

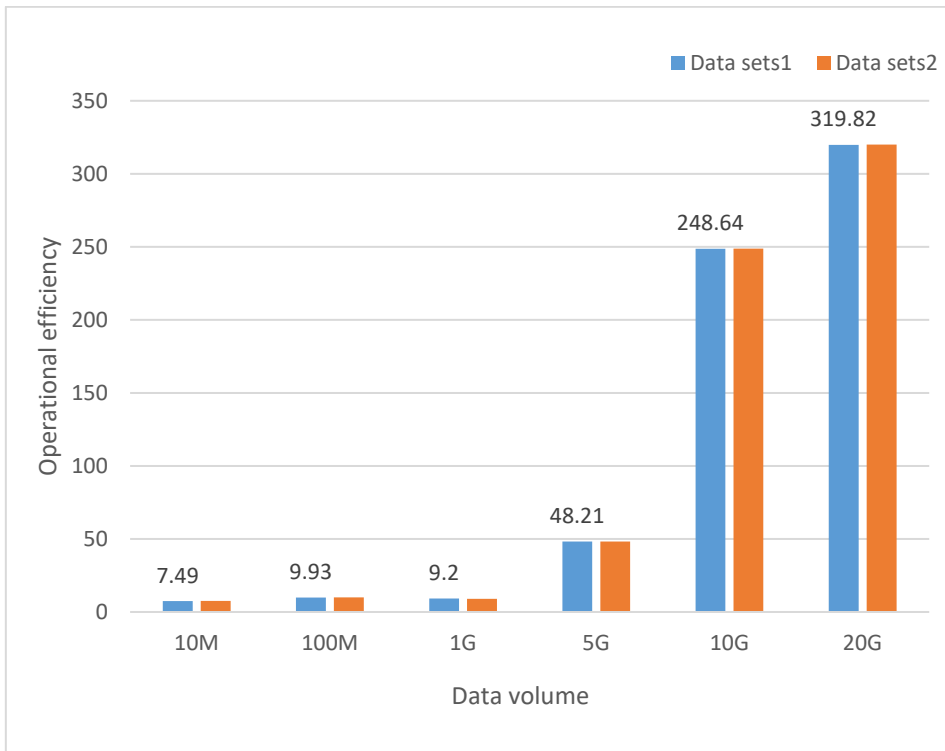


Figure 3: Parallel efficiency comparison chart for different data volumes.

In terms of the efficiency of the parallel system (as shown in Figure 3), the execution efficiency of the parallel algorithms increases significantly with the increase in the amount of data. The architecture and algorithms designed in the study showed almost no difference in the results of processing different data sets, indicating the high stability of the architecture and algorithms. This demonstrates the power of the system architecture and parallel distributed algorithms for descriptive statistical analysis of large amounts of data.

#### 4. Conclusions

The era of BD has brought unprecedented opportunities for business development and higher standards for business management. To gain an edge in the competitive market, business managers need to continuously improve their business skills, as well as the company's human resources and team spirit, and continuously upgrade relevant systems, facilities and equipment. In addition, there is a need to strengthen the management of all departments, especially the finance department, to fully recognize the central role of BD in business decision-making, and only then can the company gain an edge in the competitive market.

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