

# Analysis of Enterprise Economic Management Optimization Strategy Based on Improved Ant Colony Algorithm

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**Keywords:** Enterprise management, Existing problems, Optimization strategy

**Abstract:** Economic management, as an important part of enterprise production, plays an important role in the safe production and management of enterprises. Under the new background of the new era, it is of great practical significance to strengthen the exploration and analysis of innovation and optimization strategies for corporate economic management. The purpose of this paper is to study the status quo of enterprise economic management, and propose corresponding solutions to the problems that arise, so as to provide some feasible ideas for the further development of enterprises in economic management. Quantitative methods are used in combination with qualitative methods to study the problem of capacity integration. Combined with the characteristics of ant colony algorithms, the ant colony algorithm is used to develop and expand the set of technical capabilities. To conduct screening, build a capacity integration platform, and form a capacity integration team to integrate capabilities. Enterprises need in-depth and effective innovation and development of economic management, and fundamentally improve the level of enterprise management, management efficiency, so as to ensure that enterprises are invincible in fierce market competition.

## 1. Introduction

Economic management is the introduction of the economic management system in the company's work around the strategic objectives of practicality and long-term planning. Through a proper management system to maintain the realization of corporate profits. The production and business activities of each enterprise are not only conditioned by internal conditions, but also by various external conditions. Enterprise cost control and profit realization is a systematic work to ensure that enterprises have a better efficiency and can continue to develop an economic management model for a long period of time. Only by establishing a sound economic management system can we be invincible in the market competition. Although Chinese enterprises have accumulated rich experience in economic management and made significant progress, many problems still exist in the actual economic management process (Tabakhi S, 2014). This article mainly studies the problems existing in the economic management of Chinese enterprises, discusses the economic management strategies, and provides reference for the further development of Chinese enterprises in economic management.

In today's society, information is growing at speeds beyond people's imagination. This poses unprecedented demands on the capacity and speed of information storage systems, and various problems arising therefrom have followed. The ever-increasing demand for information data has led to an ever-increasing scale of storage systems and increasingly complex management. The contradiction between the explosive growth of information resources and the relative lack of management capabilities has become increasingly acute. At the same time, the rapid growth of such information resources also poses challenges to the reliability and scalability of storage systems, and the sharing of information resources is becoming increasingly important. In the field of scientific research and application, a large amount of data are important resources, such as global climate simulation, high-energy physics, biological calculations, battlefield simulation, nuclear simulation, digital earth, large-scale information and decision support systems, and their applications. At Terabyte or even Peta Byte level, geographically distributed scientific researchers or users all want to be able to access and analyze these huge data (Chen, 2014). However, their analytical methods are

often computationally complex and computationally expensive. Many data analysis and processing require hundreds of billions of data. Sub- or tera-scale computing capacity, and existing data management architectures, methods, and technologies can no longer meet this high-performance, high-capacity distributed storage and distributed processing capabilities. Therefore, based on the computational grid, people propose a data grid to solve the problems faced by the above applications.

With the continuous improvement of national policies and the continuous development of the national economy, the development of our country's enterprises is also growing rapidly. Both in terms of total scale and speed, major breakthroughs have been made in the development of enterprises. However, economic management, as an important part of enterprise production, plays an important role in the safe production and management of enterprises. Under the new background of the new era, it is of great practical significance to strengthen the exploration and analysis of innovation and optimization strategies for corporate economic management. The purpose of this paper is to study the status quo of China's enterprise economic management, and propose corresponding solutions to the problems that arise, so as to provide some feasible ideas for the further development of China's enterprises in economic management. Integration is used to condense the dispersive capabilities obtained after expansion into core capabilities. Quantitative methods are used in combination with qualitative methods to study the problem of capacity integration. Combined with the characteristics of ant colony algorithms, the ant colony algorithm is used to develop and expand the set of technical capabilities. To conduct screening, build a capacity integration platform, and form a capacity integration team to integrate capabilities.

## 2. Enterprise Technology Innovation Capability Based on Ant Colony Algorithm

### 2.1. Ant colony algorithm overview

Under the background of the development of bio-inspired computing research, the self-organizing behavior of social animals such as ant colonies, bee colonies, and bird groups has attracted widespread attention. Many scholars have mathematically modeled this behavior and used computers to performing simulations results in so-called "cluster intelligence". The beauty of social animals is that individual behavior is very simple, but when they work together, they can "emerge" very complex and intelligent behavioral characteristics. For example, the ability of a single ant is extremely limited, but when these simple ants form an ant colony, they can accomplish complex behaviors such as nesting, feeding, migration, and sweeping the ant colony; a group of bee colonies that behave blindly can be created. Exquisite honeycomb and birds can fly synchronously without centralized control. The ant colony algorithm capability filtering formula is as follows:

$$\max \sum_{i=1}^n v_i x_i = v_1 x_1 + v_2 x_2 + \dots + v_n x_n \quad (1)$$

In these self-organizing behaviors, the ant colony can find the shortest path from the nest to the food source in the process of foraging. Inspired by it, Italian scholars proposed a new type of intelligent optimization algorithm called Ant Algorithm in the early 1990s. The algorithm was originally used to solve the famous traveling salesman problem (TSP) and achieved better results (Secui D C. 2015). In the mid-1990s, this algorithm gradually attracted the attention of many researchers. At present, the algorithm has achieved good results in solving combinatorial optimization, function optimization, system identification, robot path planning, data mining, network routing and other issues. Ant colony algorithm flow chart shown in Figure 1.

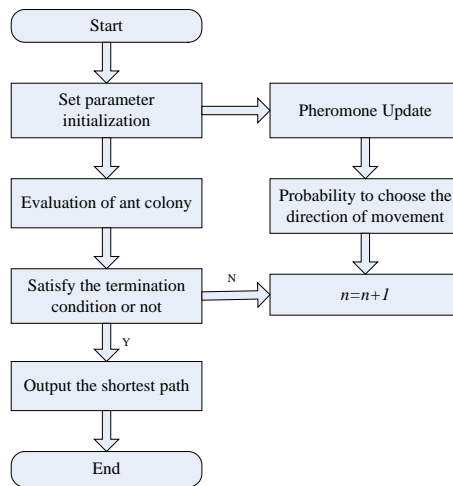


Figure 1. Ant Colony Algorithm Flowchart

Biological studies have shown that a group of cooperating ants can find the shortest path between food sources and nests, while single ants cannot. A large number of careful observations and studies have found that ants individuals communicate information through a substance called information (Pheromone) to achieve the goal of collaborative work (Shi, 2015). Ants can leave a pheromone in the path they are passing through, and ants can perceive this material during exercise. The thicker the trace of a pheromone on the road, the higher the probability that other ants will follow this path. As a result, the pheromone trail on the path will be strengthened so that more ants will choose this path. When there are fewer ants passing through certain paths, the pheromone on the path will evaporate over time. It is through this indirect communication mechanism that the ant individuals achieve the goal of synergistic searching for the shortest path of food. Their behavior as a group is an autocatalytic behavior, and the whole process has the characteristics of positive feedback.

## 2.2. The basic characteristics of ant colony algorithm

1) Self-organization: the ant colony algorithm fully embodies the self-organization. When the algorithm starts, individual artificial ants find disorderly solutions. After a period of evolution of the algorithm, artificial ants tend to seek spontaneously through the role of information hormones to close to optimal solution.

2) Parallelism: each ant's search process is independent of each other. It only communicates rapidly through information. He begins independent search at multiple points in the problem space, which not only increases the reliability of the algorithm, but also makes the algorithm have a strong global search capability.

3) Positive feedback: ants can eventually find the shortest path, which originates from the accumulation of information hormones on the shortest path, and the accumulation of pheromones is a positive feedback process.

4) Robustness: compared to other algorithms, the result of ant colony algorithm does not depend on the selection of the initial route, and the number of parameters of the ant colony algorithm is small. The ant colony algorithm is easy to use for solving other combinatorial optimization problems.

## 2.3. The deficiencies of ant colony algorithm

1) Long search time: this is the beginning of the search for citations. The difference in information hormones on each path is small. Through positive feedback on information, the information hormone on better paths gradually increases. After a long period of time, the information on the path can be better. Hormones are significantly higher than other pathways. As this process progresses, the differences become more pronounced and eventually converge. This process generally takes a long time.

2) Easy to fall into local optimum: in the ant colony algorithm, since the initial pheromone on

each path is the same, the guide information for the first ant colony to create the first path is mainly the distance information between cities, so the information hormone left by the ant colony on the path it passes is not the direction of the optimal path must be given, and the first path created by the ant colony cannot be guaranteed to lead the ant colony to the global optimal path(Xu, 2015). Since the first path may be locally optimal, with the repeated execution of the algorithm, information hormone is likely to accumulate on this locally optimal path, so that the concentration of information hormone on the path is much greater than other paths. The concentration of pheromone causes all ants to concentrate on this locally optimal path, resulting in the inability to find a global optimal solution. Figure 2 shows the circulatory system diagram of the company's economic management.

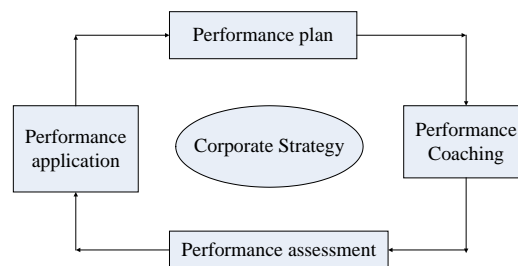


Figure 2. Business Economic Management Circulatory System Diagram

### 3. The Significance of Innovation and Optimization of Enterprise Economic Management

#### 3.1. Problems with corporate economic management

If an enterprise wants to be invincible in the fierce market competition, it must increase management input in the economic management. However, many companies have unclear understanding of economic management and insufficient attention to it, leading to a wide range of economic management problems. Generally speaking, the problems of China's corporate economic management are mainly reflected in the following aspects: first, the quality of economic management personnel is low and the level is poor. The low quality of management personnel and the difference in their level not only directly affect the level of economic management of enterprises, but also directly affect the economic benefits of enterprises. At present, the low quality of economic management personnel and the poor level are still a major issue in the economic management of enterprises. Second, the construction of economic management system is not perfect. Many enterprises do not pay much attention to the construction of economic management system, which leads to the imperfect construction of economic management system and directly affects the efficiency of enterprise economic management. Third, the implementation of economic management is not enough. Although the company has established an economic management system, due to the lack of corresponding rewards and penalties, management personnel have not implemented enough economic management. Fourth, there is no corresponding supervision and early warning mechanism(Liang,2016). An effective supervision and early warning mechanism is an important part of the economic management of enterprises. However, many enterprises are irrational in the supervision and early warning mechanism construction, which leads to the lack of supervision and early warning mechanisms and seriously affects the smooth development of the economic management of enterprises. The relationship between strategy and performance is shown in Figure 3.

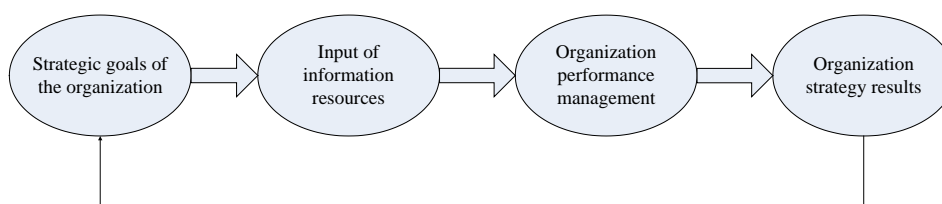


Figure 3. Strategy and performance diagram

### 3.2. Enterprise Economic Management Innovation and Optimization Strategy

Economic management is not only an important means to optimize and integrate the allocation of resources, but also the main manifestation of the productivity of enterprises. Under the current background of rapid development, the innovation and optimization of corporate economic management is very urgent. Since the actual situation of each company's AJIN is very different, its management system is also different, but the factors that affect its development are almost the same, mainly including, first, the impact of the era of knowledge economy; Second, the impact of accelerated economic globalization; Third, the impact of computer technology based on the Internet. Under the combined effect of these three influencing factors, the degree of opening up to the outside world is getting higher and higher, and the competitiveness of the international market is increasing. Under such circumstances, not only are we facing new opportunities but also new challenges. Therefore, if companies want to gain a place in a highly competitive market, they must innovate and optimize economic management so as to realize the Good development and growing. According to the current actual situation, the economic management of a company cannot simply regard financial auditing as the only means and means of economic management. Although financial auditing can effectively prevent the flow of funds and waste of corporate funds to a certain extent, The simple financial management can not fully meet the requirements of the enterprises for economic management. This not only limits the economic management, but also causes the loss of the company's funds for no reason, thereby reducing the economic efficiency of the company(Zhou, 2017). The innovation and optimization of today's corporate economic management not only refers to the innovation and optimization of economic management concepts, but also includes the innovation and optimization of economic management systems and organizational models. This is an effective way to promote the sound development of enterprises and maximize profits. Different scenarios are simulated as shown in Figure 4.

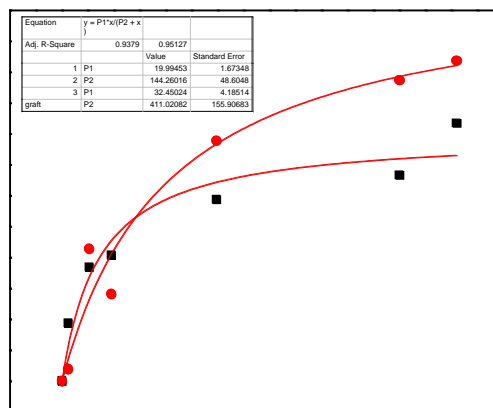


Figure 4. Different scenarios simulation

#### 3.2.1. Establish and improve corporate economic management institutions and management systems

The enterprise economic management institution is an important part of an enterprise's economic management. Only when it is managed under the supervision and management of the corresponding enterprise economic management institution can a good economic management effect be obtained. To this end, enterprises should first establish and improve corporate economic management institutions, and strengthen the scientific and effective management organizations' economic management of enterprises. When establishing a corporate economic management organization, an enterprise should maintain the independence of the economic management organization and avoid the constraints of other departments on economic management. On the other hand, we must establish and improve the corresponding economic management system. Only when the specific economic management of the enterprise is carried out under the constraints of a certain economic management system can economic management personnel truly achieve the scientific and effective economic management, give full play to the enthusiasm and initiative of the economic management

personnel, and promote the economic management of the enterprise. The smooth development of control work. Establishing and improving corporate economic management institutions and management systems is an important measure for the innovation and optimization of corporate economic management.

### 3.2.2. Improve the management quality and awareness of enterprise economic managers

The enterprise economic management personnel are the key and focus of enterprise management. After all, the enterprise economic management work is mainly completed by economic management personnel. The quality and level of corporate economic management personnel determine the level and quality of corporate economic management to a certain extent, and determine the economic benefits of the enterprise. However, due to problems in the recruitment and training of economic management personnel, enterprises have caused low-level, low-quality, and low-capacity personnel to enter the economic management process, causing problems in the actual economic management control. To this end, it is necessary to strengthen the training of enterprise economic management personnel, improve the economic management and control level of economic managers, improve the scientificness and effectiveness of the work of economic managers, ensure the smooth implementation of economic management and control of enterprises, and win more for enterprises to obtain much more profit income.

### 3.2.3. Establish and Improve the Economic Management Supervision and Early Warning Mechanism

The economic management of enterprises is an extremely complex and scientific work. Strengthening the supervision of business economic management plays an important role in improving the economic management level of enterprises. Due to the lack of corresponding enterprise economic management and supervision mechanisms, the management personnel in the actual enterprise economic management process has problems of blindness and lack of coordination, resulting in a wide range of economic management loopholes, and thus affecting the smooth development of the entire enterprise economic management. Establishing and improving early-warning mechanisms for economic and management supervision plays an important role in improving the economic management level of enterprises and ensuring the scientific and effective development of their economic management(Sun,2017). To this end, enterprises should establish and improve corresponding economic and management supervision and early-warning mechanisms, improve the safety early warning and supervision of enterprise economic management, and ensure the smooth development of enterprise production. At the same time, enterprises should also strengthen the construction of economic management supervision and early warning teams, improve the management level and ability of economic management supervision and early warning teams, and ensure the coordinated and efficient operation of the economic management of enterprises. The economic efficiency of the company before and after the improvement is shown below.

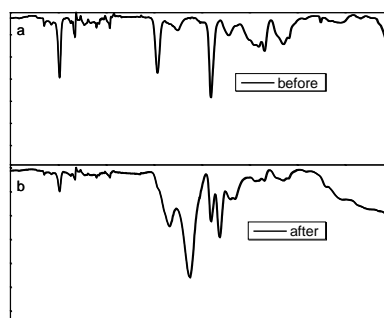


Figure 5. Before and after improving the economic efficiency of the company

## **4. The Innovation and Optimization Strategy of Enterprise Economic Management**

### **4.1. Constantly creating high-tech and optimizing economic management concepts**

The first condition for the enterprise's economic management to achieve innovation and optimization is to use innovative economic management concepts as guidance. Only by mastering advanced economic management concepts can the company and employees be better guided to contribute to the company's economic interests. The management of the company should create a positive, optimistic and hard working atmosphere for its employees and adopt different measures or systems to actively guide employees' innovation activities. Under the background of a new era, the pressure of competition among enterprises is very large. Therefore, each company should establish a strong sense of crisis and establish a scientific and rational economic management strategy mechanism based on actual conditions. In the process of formulating an economic management strategy, business leaders should proceed from the perspective of overall planning and overall situation, and constantly improve the strategic plan so as to effectively avoid the occurrence of trade-offs. In addition, business leaders must continue to innovate the production and operation of the company, so as to better adapt to the development trend of the current era.

### **4.2. Innovate and optimize enterprise economic management system**

The system is the normative standard for normal production and operation of an enterprise. Enterprises want innovative economic management, in addition to innovative management concepts, but also need to innovate and optimize the economic management system. Therefore, all companies should proceed from the current actual situation, combine their own development trends and directions, and establish a compatible, implementable, and perfect economic management system to ensure the healthy and stable rapid development of the company. Enterprises should first establish a "people-oriented" management system, consider employees from the perspective of employees, such as improving the staff salary system, the establishment of rewards and penalties system and performance appraisal system, etc. Second, companies also need to pay high attention to human resources and attention. Third, enterprises need to establish effective mechanisms for decision-making and supervision. The main purpose of formulating decision-making and supervision systems is to advocate and uphold democracy, so that employees can make their utmost efforts for the development of the company. At the same time, the company also needs to combine the interests of the company with the interests of the employees, fundamentally improve the enthusiasm and vitality of the employees, and make the entire enterprise full of vigor and vitality.

### **4.3. Innovation and optimization of economic management organization model**

The economic management organization also plays an indispensable role in the development of the company. A scientific and rational economic management organization can not only improve the corporate economy, but also increase social benefits; and an outdated economic management organization will seriously reduce the number of enterprises economic and social benefits. Therefore, it is very necessary to innovate and optimize the economic management organization model. First of all, the economic management organizations of enterprises should be softened and reflect the "people-oriented" ideology. Second, they should promote the flattening of the economic management of enterprises and simplify the level and procedures of economic management so as to form a compact management structure. Third, establish virtualization. Economic management mechanism. With the development of science and technology in our country, information technology has been widely used in enterprises (An, 2017). Enterprises need to use information technology to plan and plan economic management organizational structure effectively, effectively integrate management information and management data, thus establishing invisible the management mechanism.

In the market economy system, the quality of the management model is related to the survival of the enterprise. Compared with foreign companies and state-owned enterprises, private enterprises

have problems such as small-scale enterprises and weak survivability. Many of them are family-owned enterprises. The camp management model lacks the correct understanding. Through research, it is found that there are external constraints such as imperfect legal protection, financing difficulties, and discriminatory treatment in the development of private enterprises in China. At the same time, in the internal daily management, the irrational division of the organizational structure of the private enterprises and the division of responsibilities are not clear, there is no study of corporate culture and fairness and fairness to employees, the power is too concentrated, and there are no problems such as in-depth analysis of customers and markets. In view of the above problems, the state should formulate relevant laws to protect the legitimate rights and interests of private enterprises. At the same time, in terms of internal management, it should establish a scientific organizational structure and management model in accordance with the development stage. The enterprise economic management efficiency chart is shown in Figure 6.

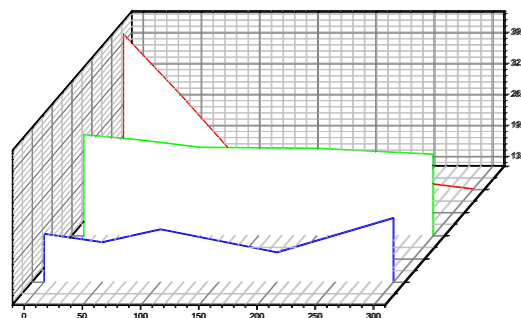


Figure 6. Business Economic Management Efficiency Chart

Corporate culture is a kind of influence and reform on the internal spiritual level of an enterprise, and it is also an enterprise that strengthens management and institutional innovation. Necessary means. More and more entrepreneurs have realized that only through the introduction of a performance-oriented corporate culture in the course of business operations can they form core values in the pursuit of outstanding performance, thereby promoting the healthy, steady and rapid development of the company. Therefore, guiding a daily business operation with a good corporate culture is an effective and positive factor that influences corporate performance. Then, a company must achieve the ideal state of the core values of the pursuit of outstanding performance. It should start with the following points: First of all, pay attention to the daily work of employees and drive a virtuous cycle of the company. A kind of edification and reform are also necessary means for enterprises to strengthen management and institutional innovation. During the construction of corporate culture, due to the influence of a good cultural atmosphere and the vision of a beautiful company, the desire of employees to innovate and the motivation for their work will be greatly enhanced, thus creating a positive and progressive cultural atmosphere in the company. Its long-term impact is to retain talent, encourage innovation and continuous learning. From the realization of the individual goals of employees, the improvement of the overall efficiency of the company, and the stable development of the scale of the company, the corporate culture will have a good impetus to the performance of the company. Secondly, we should use international management methods to improve corporate competition. The introduction of corporate culture is the entry of business management. An important step in internationalization is also the necessary steps for companies to use Western advanced management methods for their own purposes, in order to ensure that enterprises achieve development in the fierce market competition. The introduction of corporate culture is not only about the creation of corporate souls, but also the major reforms at the management framework level that cover the core content of enterprise operations such as technical standards, management standards, and work standards. Finally, the company concludes a "psychological contract" and ultimately achieves stable performance. Essentially, corporate culture has made every member of the company establish a deep relationship with the company and concluded a "psychological contract." In this atmosphere, the managers of the company will take



the initiative to understand the economic needs and development aspirations of the front-line employees and try to meet them through various means. The employees will also actively explore their personal potential and devote themselves to the common future of themselves and the company.

## 5. Conclusion

The enterprise economic management includes the enterprise's internal audit, human resources, production and other aspects of management, high-quality products can not be separated from the company's economic management. In the face of today's highly competitive market, companies can only manage their economic activities with a scientific economic management system, establish a sound document internal auditing system, and production and control systems to firmly grasp the user's demand for product quality. Through scientific economic management, effective integration of manpower, materials and production, and grasping the relationship among quality, brand, and market, can the company's profits remain stable. Chinese enterprises have accumulated rich experience in economic management. However, in the actual economic management process, the existence of many problems has seriously affected the further development of the economic management of the industry. Enterprises should in-depth study of the status quo of economic management, innovative economic management strategies, and provide reference for the further development of China's enterprises in economic management. The economic management of an enterprise directly determines the direction and development trend of this enterprise. Innovation and optimization are the necessary ways for a company to succeed and are the basic driving force. Under the current new situation, enterprises' innovation and optimization of economic management is one of the important means to improve the competitiveness of enterprises. To achieve healthy development, maintain a good development trend, and achieve sustainable development, enterprises need in-depth and effective innovation and development of economic management, and fundamentally improve the level of enterprise management, management efficiency, so as to ensure that enterprises are fierce Market competition is invincible.

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