

# Research on the Value of the Coal Multi-Industry Collaborative Management Platform from the Perspective of Management Science

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**Abstract:** With the deepening of China's "dual carbon" strategy and energy revolution, the coal industry has gradually transformed from single mining to multi-industry collaboration, forming an industrial pattern covering coal production, processing, and transformation, and other fields. As the core carrier of the digital transformation of coal enterprises, the multi-industry collaborative management platform can more effectively integrate industrial resources and break business barriers. In view of this, this paper analyzes the coal multi-industry collaborative management platform from the perspective of management science and puts forward corresponding strategies.

**Keywords:** Management science; Coal multi-industry; Collaborative management platform; Value research

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## 1. Significance of constructing the coal multi-industry collaborative management platform from the perspective of management science

### 1.1. Conducive to improving the management efficiency of coal enterprises' multi-industry and reducing management costs

At present, the coal multi-industry has problems such as decentralized management and excessive levels, which are likely to lead to low management efficiency and high management costs. By integrating the management processes of various industrial sectors, the collaborative management platform can effectively standardize the management processes, reduce management levels to a certain extent, simplify business processes, and thus significantly reduce errors caused by human intervention<sup>[1]</sup>. At the same time, the coal multi-industry collaborative management platform can realize the real-time intercommunication and sharing of information among various sectors, avoid the formation of information silos, help improve the scientificity and timeliness of management decisions, and thereby greatly reduce management costs.

## **1.2. Conducive to optimizing resource allocation and improving industrial collaborative efficiency**

The core advantage of the coal multi-industry lies in the complementarity and synergy of resources. However, insufficient resource integration and poor collaboration are the key bottlenecks restricting industrial development. The collaborative management platform can better integrate various resources of the coal multi-industry, including coal resources and technical resources. Through accurate analysis and reasonable allocation of these resources, it can effectively achieve the optimal allocation of resources among various industrial sectors and business links, and better give play to the complementarity and synergy of resources<sup>[2]</sup>. For example, in the coal production and logistics links, the coal multi-industry collaborative management platform can real-time connect coal output, inventory, and transportation demand, further optimize transportation routes and schemes, reduce the empty transportation rate, and thus significantly improve logistics efficiency. In the coal processing and sales links, the platform can more effectively integrate market demand information and processing capacity information, further optimize processing schemes, realize the accurate connection of production, supply, and marketing, and greatly improve industrial collaborative efficiency.

## **1.3. Conducive to enhancing risk prevention and control and ensuring the healthy development of the industry**

The coal multi-industry involves a wide range of fields, with a long industrial chain and many risk points to bear, including safety risks and market risks. Under the traditional risk management and control model, it is difficult to achieve comprehensive and real-time prevention and control of various risks. The collaborative management platform can construct a comprehensive risk prevention and control system by integrating risk information from various industrial sectors, so as to realize real-time monitoring and accurate early warning of various risks<sup>[3]</sup>. For example, in the coal production link, the platform can real-time monitor the safe production status of mines through the Internet of Things technology, detect potential safety hazards in a more timely manner, and issue early warnings, which is conducive to preventing the occurrence of safety production accidents. In the market link, the platform can real-time collect information such as market prices and demand changes, so as to better predict market risks and provide support for enterprise leaders' decision-making.

## **2. Problems in the construction and operation of the coal multi-industry collaborative management platform from the perspective of management science**

### **2.1. Outdated management concepts and insufficient collaborative awareness**

Outdated management concepts are the key problem restricting the construction and operation of the coal multi-industry collaborative management platform. For a long time, many coal enterprises have been affected by the traditional planned economic system and single mining mode, and have gradually formed a management concept of "decentralized management and independent operation." There is a lack of collaborative awareness among various industrial sectors and departments. They pay too much attention to their own interests and ignore the overall interests of the enterprise and the value of industrial collaboration<sup>[4]</sup>. For example, the management of enterprises does not attach enough importance to the collaborative management platform. Many managers still stay in the traditional management thinking mode, believing that the collaborative management platform is only a simple information integration tool, ignoring the core value of the platform in optimizing the management mode and improving the collaborative mechanism. For grass-roots employees, their collaborative awareness and

digital awareness are relatively insufficient. Most employees are accustomed to their own work processes and management methods, which leads to their low acceptance of the collaborative management platform and lack of corresponding collaborative awareness <sup>[5]</sup>.

## **2.2. Imperfect collaborative mechanism and lack of effective guarantee**

The collaborative mechanism is the core guarantee for the effective operation of the collaborative management platform and the key to realizing the collaborative development of the multi-industry. However, in the current construction of the coal multi-industry collaborative management platform, there are certain problems with imperfect collaborative mechanisms. The collaborative decision-making mechanism of some coal multi-industry collaborative management platforms is not sound, with many decision-making subjects and certain differences in various decision-making processes and standards, making it difficult to form a unified decision-making system. In the process of major decision-making, each sector usually starts from its own interests, leading to a lack of effective communication and consultation among different sectors, which is likely to result in low decision-making efficiency <sup>[6]</sup>. In addition, although the collaborative management platform provides a carrier for communication among various sectors, due to the lack of a relatively perfect collaborative communication mechanism, there are still some problems in communication among various sectors and departments. Non-standard communication processes and single communication channels will affect the communication effect.

## **2.3. Insufficient resource integration and inadequate platform function utilization**

Information resources from various sectors and links of the coal multi-industry are scattered across different systems and departments. They lack a unified information integration standard and mechanism, which makes it difficult to achieve effective sharing and intercommunication of information resources, thus gradually forming “information silos.” The business resources of the coal multi-industry include production resources and processing resources. At present, the integration of these business resources is still at a superficial level, lacking in-depth collaborative integration, which is a direct reflection of insufficient business resource integration <sup>[7]</sup>. In terms of human resource integration, the coal multi-industry collaborative management platform also has certain deficiencies. The corresponding talent structure is unreasonable, and the existing human resources are difficult to meet the needs of platform construction and operation.

# **3. Optimization strategies of the coal multi-industry collaborative management platform from the perspective of management science**

## **3.1. Update management concepts and strengthen collaborative awareness**

The update of management concepts is the premise for the construction and optimization of the collaborative management platform. Therefore, the enterprise needs to establish a higher-quality collaborative management concept and further strengthen the overall collaborative awareness, so as to better promote the construction and operation of the platform on the right track. In the actual work of the coal multi-industry collaborative management platform, the enterprise management should take the lead in changing their management thinking, actively break the traditional concept of “decentralized management and independent operation”, and establish a collaborative management concept of “collaborative development and overall priority”, so as to more fully recognize the core value of the collaborative management platform in optimizing the management mode and improving collaborative efficiency <sup>[8]</sup>. At the same time, enterprises need to incorporate the construction of the coal multi-industry

collaborative management platform into their own development strategic planning, further increase investment in platform construction, improve the platform construction plan, and ensure the systematicness and forward-looking nature of the platform construction. In addition, the enterprise needs to establish a digital management concept, so as to better recognize that digital transformation is an inevitable trend for the high-quality development of the coal industry, thus taking the collaborative management platform as the core carrier of digital transformation, and further promoting the transformation of the management mode from traditional extensive to digital, refined and collaborative<sup>[9]</sup>.

Moreover, the enterprise needs to continuously strengthen the publicity and education for all employees. Through special training, lectures and other ways, popularize the importance of collaborative management and digital management to employees, so that employees can fully recognize the important role of the collaborative management platform in improving work efficiency and reducing work burden, enhance their acceptance and recognition of the platform, and further stimulate their enthusiasm for active collaboration and active application of the platform<sup>[10]</sup>. The enterprise also needs to strengthen the digital skills training for employees, continuously improve their digital operation level, so that employees can use the platform more proficiently to carry out work and give full play to the platform's functions.

### **3.2. Improve the collaborative mechanism and strengthen the collaborative guarantee**

A sound collaborative mechanism is the core guarantee for the effective operation of the collaborative management platform. Therefore, enterprises can try to combine the characteristics of the coal multi-industry, start from collaborative decision-making and collaborative communication, construct a more perfect collaborative mechanism, and further strengthen collaborative guarantee. To this end, enterprises can try to build a collaborative decision-making system of “unified leadership, hierarchical responsibility, and collaborative linkage”, further clarify the decision-making subject and decision-making process, so as to realize scientific and democratic decision-making. Enterprises can also set up a collaborative decision-making leading group led by senior leaders and participated by the person in charge of each industrial sector according to their own actual situation, which is mainly responsible for coordinating major decision-making issues in the collaborative development of multiple industries, and formulating a unified decision-making plan and decision-making standard. Enterprises can also try to establish a collaborative decision-making communication and consultation mechanism, organize full communication and consultation among various sectors and departments in the process of major decision-making, so as to fully listen to the opinions of all parties, ensure the interests of all parties, and ensure that the corresponding decisions are more in line with the overall development strategy of the enterprise<sup>[11]</sup>.

To ensure the construction effect of the coal multi-industry collaborative management platform, enterprises can try to build a “diversified, standardized, and real-time” collaborative communication mechanism, which can better break the communication barriers among various sectors and realize the timely transmission and accurate sharing of information. To this end, enterprises should clarify the communication responsibilities and standards of each sector, continuously optimize the communication process, and ensure the orderly and efficient development of communication. At the same time, enterprises need to continuously expand communication channels. In addition to carrying out online communication relying on the collaborative management platform, enterprises can also establish a face-to-face communication method, which can solve some complex collaborative problems in a more timely manner<sup>[12]</sup>. To ensure the fairness of interest distribution, enterprises can try to build a “fair and impartial, equal rights and responsibilities” interest distribution mechanism, which can more fully mobilize the

enthusiasm of various sectors to participate in collaboration. In practice, enterprises can try to establish a more scientific and reasonable interest distribution standard, analyze the input and contribution of each sector, and formulate a differentiated interest distribution plan, so as to better ensure that the interest distribution matches the efforts of each sector and ensures the fairness and impartiality of the coal multi-industry collaborative management platform.

### **3.3. Strengthen resource integration and improve platform efficiency**

Resource integration is the core function of the collaborative management platform. Therefore, enterprises can combine the resource characteristics of the coal multi-industry, start from information resources, business resources, and human resources, further strengthen the level of resource integration, and improve platform collaborative efficiency. To this end, enterprises need to actively promote the integration of information resources, bravely break information silos, formulate unified standards and norms for information resource integration, and further clarify standards such as data coding and data format, so as to realize the standardization of information resources in various sectors<sup>[13]</sup>. Enterprises can also establish a unified information resource database according to the actual situation to more efficiently integrate information resources from various industrial sectors and business links, so as to realize the centralized management of information resources. For example, enterprises can learn from the experience of Shendong Coal Group of China Energy Investment Corporation, realize the integration and sharing of equipment data from different suppliers by unifying equipment communication protocols and data formats, which can effectively solve the problem of “information silos.” At the same time, enterprises can establish an information resource update mechanism, clarify the responsibility and frequency of information update, so as to ensure the timeliness and accuracy of information resources. In addition, enterprises need to continuously deepen the integration of business resources, improve the degree of collaboration, take the collaborative management platform as the carrier, further deepen the integration and collaboration effect of business resources in various industrial sectors, so as to realize the seamless connection and optimization and upgrading of business processes<sup>[14]</sup>. In practical work, enterprises need to actively optimize business processes such as production and processing, break the pattern of independent business processes in various sectors, and build a collaborative business process system, so as to realize the accurate connection and efficient collaboration of various business links.

Moreover, enterprises need to continuously enhance the level of human resource integration, actively optimize the talent structure, and establish a unified human resource allocation and management mechanism, so as to realize the integration and utilization of talent resources in various sectors and achieve the optimal allocation of talents. The coal multi-industry collaborative management platform should increase the training and introduction of compound talents. Enterprises can formulate a compound talent training plan according to their own situation, and cultivate more compound talents who understand both coal industry business, digital technology, and collaborative management through internal training, school-enterprise cooperation, and other ways, so as to effectively enrich the talent team<sup>[15]</sup>. In addition, the platform also needs to continuously improve the talent training mechanism, strengthen the training of employees’ digital skills, collaborative awareness, and professional ability, and regularly organize special training, skill competitions, and other activities, so as to significantly improve the overall quality of employees. By establishing and improving the talent incentive mechanism, improving the salary and welfare system, and giving appropriate incentives to compound talents and core talents, enterprises can more effectively stimulate the work enthusiasm and creativity of talents, so as to provide strong talent support for platform construction and operation.

## Disclosure statement

The author declares no conflict of interest.

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