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The New Direction of Intelligent Development of State-owned Enterprises in the Era of Digital Economy

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Abstract: In the era of digital economy, the intelligent development of state-owned enterprises has become the key to enhance governmental competitiveness and promote high-quality economic development. This paper discusses the necessity, present situation and challenges of intelligent development of state-owned enterprises, and puts forward a new development path. The article points out that intelligent development can not only enhance the competitiveness of enterprises, but also promote industrial upgrading, which has an important impact on the country's economic strength. At present, state-owned enterprises have made remarkable progress in intelligent transformation, but at the same time they are also facing challenges in technology, talents and management system. In order to meet these challenges, this paper puts forward a series of strategies: formulating top-level design, strengthening technological innovation, training and introducing talents, optimizing management system, deepening cooperation in Industry-University-Research, etc. These strategies aim to promote state-owned enterprises to achieve a qualitative leap in the wave of intelligence and contribute to economic and social development through technological innovation, organizational optimization, business integration and cultural cultivation. This paper aims to provide theoretical support and practical guidance for the intelligent transformation of state-owned enterprises, and help enterprises achieve higher quality and more sustainable development in the digital economy era.

1. Introduction

With the rapid progress of science and technology and the deep integration of the global economy, the era of digital economy has quietly arrived. With data as the core resource and digitalization, networking and intelligence as its distinctive features, it is profoundly changing the traditional economic structure and industrial ecology [1]. Under the background of this era, state-owned enterprises, as the important pillar and backbone of national economic development, how to adapt to the digital wave and realize intelligent development is not only related to their own future destiny, but also of great significance to enhance the overall competitiveness of the country and promote high-quality economic development.

Intelligent development, as one of the important trends in the digital economy era, provides a new path for the transformation and upgrading of state-owned enterprises [2]. By deeply integrating advanced information technology, artificial intelligence technology and all aspects of enterprise production and operation, intelligence can not only significantly improve the operational efficiency

and management level of state-owned enterprises, but also help enterprises to open up new market space and cultivate new growth points [3]. Therefore, actively exploring the new direction of intelligent development has become an urgent task for state-owned enterprises to meet the challenges of the digital economy era and seize the development opportunities.

This paper will put forward a series of targeted and operable development strategies and implementation paths, in order to provide theoretical support and practical guidance for the intelligent transformation of state-owned enterprises, and help state-owned enterprises sail in the digital economy era to achieve higher quality and more sustainable development.

2. Necessity of intelligent development of state-owned enterprises

Intelligent development is the key to enhance the competitiveness of enterprises. With the increasingly fierce market competition, the traditional mode of production and operation has been difficult to meet the needs of the sustainable development of state-owned enterprises. By introducing intelligent technology, state-owned enterprises can optimize production processes and achieve refined management, thereby reducing costs and improving efficiency. This improvement in competitiveness will not only help state-owned enterprises to gain a firm position in the domestic market, but also win more voice and share in the international market.

Intelligent development helps to promote industrial upgrading. As an important force of national economic development, the intelligent transformation of state-owned enterprises will drive the innovation and development of the whole industrial chain. Through the infiltration and integration of intelligent technology, state-owned enterprises can lead related industries to develop in a higher level and with higher quality, and form a synergistic effect of industrial chain, thus enhancing the international competitiveness of the whole industry. Intelligent development is of great significance for strengthening the national economic strength [4]. State-owned enterprises are an important pillar of the national economy, and the success of their intelligent transformation is directly related to the overall development quality of the national economy. Through intelligent development, state-owned enterprises can use resources more effectively and enhance their innovation ability, thus providing strong support for the steady growth of the national economy. At the same time, the wide application of intelligent technology will also promote the overall improvement of social productive forces and lay a solid foundation for the long-term development of the country.

The intelligent development of state-owned enterprises is not only the internal demand of their own development, but also the inevitable choice to conform to the trend of the digital economy era and enhance the overall competitiveness of the country. Therefore, state-owned enterprises should actively explore new paths of intelligent development and inject strong impetus into achieving high-quality development.

3. Present situation and challenges of intelligent development of state-owned enterprises

3.1. Analysis of existing circumstance

State-owned enterprises have made remarkable progress and achievements on the road of intelligent development. In response to the call of the country, many state-owned enterprises have formulated clear digital transformation strategies and actively put them into practice. Nearly half of them have not only planned blueprints, but also taken substantive measures to promote this process [5]. In actual production and operation, the application of digital technology has become the norm, which has significantly improved the efficiency and quality of production and management, including the popularization of three-dimensional digital modeling and simulation and the construction of intelligent manufacturing and digital workshops (see Table 1). In addition, the

technological innovation ability of state-owned enterprises is also constantly enhanced, and a number of digital technology achievements have been successfully developed and recognized in professional competitions (see Table 2).

Table 1: Some key progress and achievements of state-owned enterprises in digital transformation (source: compiled by the author)

Statistical items	data	time
Number of national demonstration factories	421 households	As of the end of December 2023
Number of provincial digital workshops and smart factories	Over ten thousand households	As of the end of December 2023
Popularization rate of digital R&D and design tools	79.6%	As of the end of December 2023
Numerical control rate of key processes	62.2%	As of the end of December 2023
Number of high-level industrial Internet platforms of central enterprises	54	As of 2023
Total revenue and GDP ratio of state-owned enterprises	In 2022, the total revenue reached 82.6 trillion yuan, accounting for over 68% of GDP.	2022

Table 2: Statistics of digital technology achievements made by state-owned enterprises in the field of digital technology from 2020 to 2023 (data source: compiled by the author)

Year	Number of achievements	Specific Achievements
2020	10 items	The State-owned Assets Supervision and Administration Commission (SASAC) issued the "Notice on Accelerating the Digital Transformation of State-owned Enterprises"
2021	10 items	It released ten digital technology achievements of state-owned enterprises, including those in core electronic components, industrial software, digital platforms, etc.
2022	10 items	It released ten digital technology achievements of state-owned enterprises, including the architecture of the next-generation intelligent vehicle digital base, digital steam turbine monitoring instrument system, etc.
2023	10 items	It released ten digital technology achievements of state-owned enterprises, including high-precision inertial navigation microsystems, 400G silicon-based optical transceiver chips, Kunlun ERP, etc.

At the same time, state-owned enterprises are trying to combine intelligent development with green transformation as the driving force for enterprises to move towards high-end, intelligent and green, and promote the realization of sustainable development strategy. This combination is not only reflected in the optimization and upgrading of production methods, but also in the strategic adjustment of the overall development direction of enterprises, aiming at improving the efficiency of resource utilization and reducing environmental pollution through intelligent means, thus achieving a win-win situation of economic benefits and environmental protection.

3.2. Challenge analysis

State-owned enterprises are facing multiple challenges in the process of digital transformation, including the need to master key core technologies, especially in the fields of cloud computing, artificial intelligence and big data, and the collaboration of Industry-University-Research; The contradiction between the demand and scarcity of compound talents who know both business and technology in the market; Establish a brand-new management system and corporate culture to adapt to digital development, so as to adapt to the new behavior mode of employees; In the face of the long-term capital investment required for digital transformation and its long effective period, it is necessary to maintain sufficient patience and continuous support; At the same time, in terms of data security and compliance, we must ensure the legitimacy and security in the process of data processing, and ensure that the content generation complies with social ethics [6]; In addition, although the state-owned enterprises in the eastern region are leading in digitalization, the regional differences are gradually narrowing, and enterprises still need to further optimize their spatial layout to bridge the digital divide.

4. The new direction of intelligent development of state-owned enterprises

4.1. Develop top-level design

As an important pillar of the national economy, the intelligent development of state-owned enterprises is not only related to the improvement of their own competitiveness, but also an important part of the national strategic layout. Top-level design refers to the overall planning and design of a certain field or project at the highest decision-making level, which determines the direction and path of intelligent development. For state-owned enterprises, formulating a clear intelligent development strategy is the premise to ensure the success of intelligent transformation. This includes defining the goals, principles, key tasks and safeguard measures of intelligent development, and how to enhance the core competitiveness of enterprises through intelligent transformation [7]. When planning and implementing intelligent transformation, enterprises need to comprehensively consider the path of technology, organization, business and culture.

The new direction of intelligent development of state-owned enterprises needs to start with the top-level design, define the development strategy, plan the implementation path, and set clear short-,medium-and long-term goals. Through technological innovation, organizational optimization, business integration and cultural cultivation and other efforts, state-owned enterprises will be promoted to achieve a qualitative leap in the wave of intelligence and contribute to economic and social development (see Figure 1).

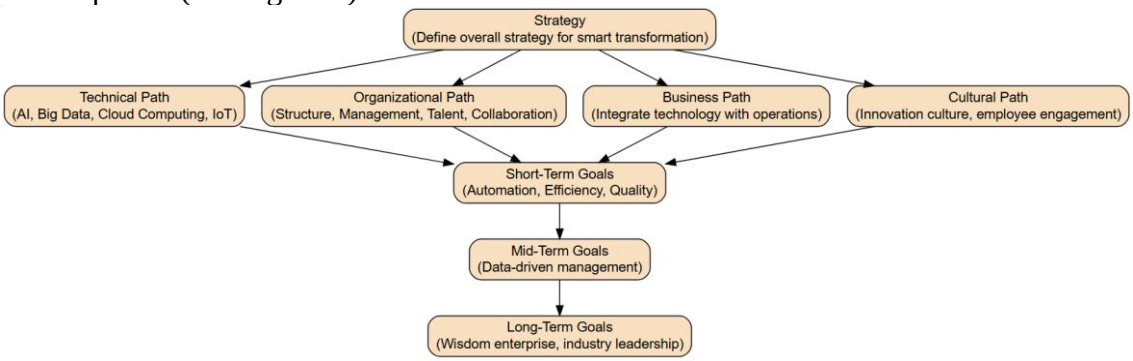

Figure 1: Top-level design of intelligent transformation of state-owned enterprises

On the technical level, enterprises should choose technical routes suitable for their own

development, such as artificial intelligence, big data, cloud computing and the Internet of Things, combined with technology introduction and independent research and development. On the organizational path, enterprises need to build an intelligent organizational structure and management system, cultivate and introduce intelligent talents, and establish a cross-departmental cooperation mechanism. Business path requires enterprises to deeply integrate intelligent technology with business processes in order to optimize production processes and improve operational efficiency, while innovating service models. On the cultural path, it is necessary to cultivate a corporate culture with innovation as the core, encourage employees to actively participate in intelligent transformation, and form an atmosphere of innovation for all employees. In the aspect of goal setting, the short-term goal focuses on the automation and informatization of key production links to improve production efficiency and product quality; The medium-term goal is to build a perfect intelligent management system, realize data-driven decision support and improve management level; The long-term goal is to build an intelligent enterprise, realize comprehensive digitalization, networking and intelligence, and lead the development of the industry.

4.2. Strengthen technological innovation

The key to the intelligent development of state-owned enterprises lies in strengthening technological innovation, supporting the research and development of intelligent technology by increasing R&D investment and setting up special funds, and cooperating with universities and research institutes to promote the transformation and application of scientific and technological achievements; Focus on national strategic needs, overcome key core technologies, and make breakthroughs in frontier fields such as artificial intelligence, big data, cloud computing, and Internet of Things; Establish and improve the innovation system, cultivate innovative talents, strengthen the protection of intellectual property rights, and encourage internal innovation activities, so as to enhance the ability of independent innovation and promote the comprehensive reform of enterprises in production methods, management methods and business models, thus contributing to the country's economic and social development.

4.3. Talent cultivation and introduction

In the intelligent development of state-owned enterprises, the cultivation and introduction of talents is very important, involving the construction of a perfect talent system. Enterprises need to cultivate talents with good moral character, innovative ability and good education, adopt long-term and personalized means, and provide a favorable environment and platform. At the same time, we should vigorously introduce overseas talents and other high-end talents in short supply, rationally plan the introduction work, and pay attention to the integration with local talents. In order to make effective use of human resources, enterprises should put talents in suitable positions according to their characteristics and create an innovative cultural atmosphere. In addition, it is necessary to establish a market-oriented salary system and assessment mechanism to attract foreign talents, change the traditional style of work and stimulate the vitality of employees.

In order to promote the development of talents, state-owned enterprises should set up a regular exchange system, design a career development plan, and build a career channel that can be converted between different positions. In particular, it is necessary to create an innovative ecological environment, break through salary restrictions and attract key technical talents; Implement skill development management, reform the evaluation system, and enhance the status and pride of skilled personnel; Strengthen the construction of enterprise culture, cultivate compound party building talents, and enhance the soft power and strategic management ability of enterprises.

4.4. Optimize the management system

With the rapid development of science and technology, intelligence has become a key factor to promote the transformation and upgrading of enterprises and enhance their competitiveness. For state-owned enterprises, intelligent development is not only an inevitable choice to conform to the trend of the times, but also an inherent requirement to improve operational efficiency and achieve high-quality development. In this context, it is particularly important to optimize the management system and establish an organizational structure and management system that adapts to intelligent development (see Figure 2).

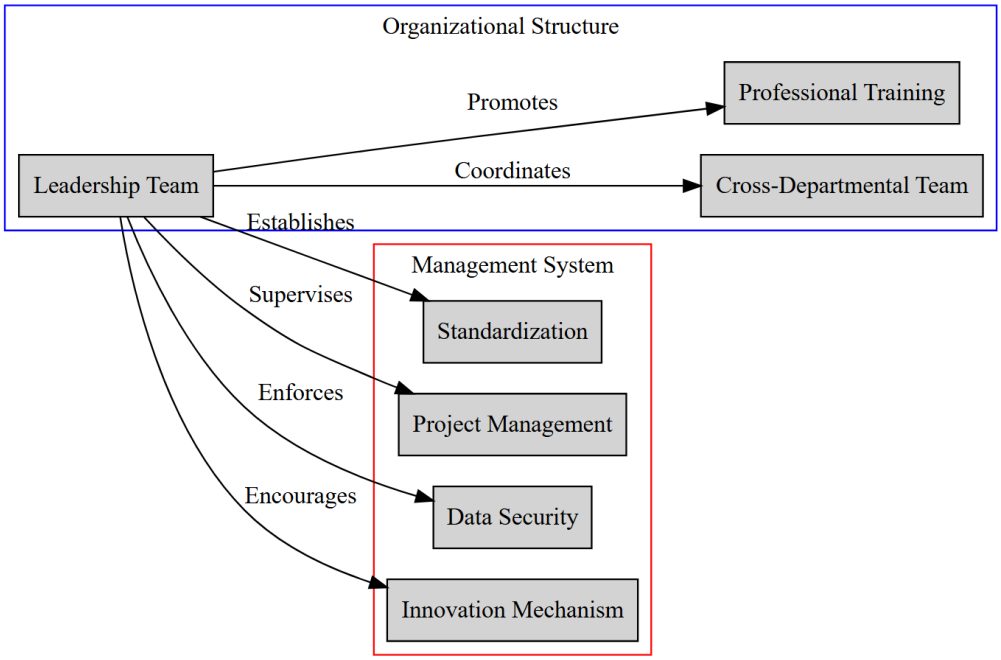

Figure 2: Optimization of management system

In order to adapt to the intelligent development, state-owned enterprises need to establish a special organizational structure, including setting up an intelligent leading group headed by senior leaders, formulating an intelligent development strategy and coordinating it with the overall strategy of the enterprise; Set up an inter-departmental intelligent team to break traditional barriers and promote information sharing and collaborative innovation; At the same time, through training and introduction, we will cultivate intelligent talents with international vision and professional ability, and provide a solid talent guarantee for intelligent development.

In the process of intelligent development, state-owned enterprises must improve the corresponding management system to adapt to this transformation. First of all, it is necessary to formulate and follow the technical standards and management norms related to intelligence to ensure the standardization and standardization of workflow. Secondly, the optimization of project management and evaluation mechanism is the key, which involves the whole process from project establishment to implementation, monitoring and evaluation, with the aim of ensuring the smooth implementation of the project and achieving the expected results. In addition, data security and privacy protection are also important parts of intelligent management, and data need to be managed throughout the life cycle to ensure compliance and security. Finally, build a mechanism of continuous improvement and innovation, and constantly promote the intelligent development of enterprises by encouraging employees to put forward innovative ideas and suggestions for improvement.

4.5. Deepen cooperation in Industry-University-Research

As an important pillar of the national economy, the improvement of the intelligence level of state-owned enterprises is of great significance to the modernization of the overall economy. However, intelligent transformation faces many challenges, such as technology research and development, personnel training and innovation mechanism. The traditional R&D model has been difficult to meet the needs of rapid development. Therefore, it is an effective way to solve these problems by deepening Industry-University-Research's cooperation, integrating resources from all sides and forming a joint force [8].

In order to deepen cooperation in Industry-University-Research, state-owned enterprises should establish long-term cooperative relations with universities and scientific research institutions, jointly develop core technologies such as artificial intelligence and big data, ensure stable cooperation by jointly building R&D centers and signing agreements, and carry out talent exchange and training plans to share R&D results; The government needs to provide policy support, such as tax incentives and financial support, to create a good cooperation environment. It is expected that this will accelerate the transformation of technological innovation, cultivate high-end compound talents, enhance the international competitiveness of state-owned enterprises, and promote industrial upgrading and optimization.

Deepening cooperation in Industry-University-Research is a new direction for the intelligent development of state-owned enterprises. Through close cooperation with universities and scientific research institutions, resources can be effectively integrated, technological innovation can be accelerated, talents can be trained, and the overall competitiveness of enterprises can be enhanced. The government's support and good policy environment will provide a solid foundation for this cooperation model. In the future, with the deepening of cooperation, state-owned enterprises will take more solid steps on the road of intelligence and make greater contributions to economic and social development.

5. Conclusion

In the era of digital economy, the new direction of intelligent development of state-owned enterprises is reflected in the clarity of top-level design, the strengthening of technological innovation, the emphasis on talent training and introduction, the optimization of management system and the deepening of cooperation in Industry-University-Research. Through these strategies and implementation paths, state-owned enterprises can effectively meet the challenges of the digital age, enhance their competitiveness, and contribute to the high-quality development of the country's economy.

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