

The Commercial Application Scenario and Development Path of Intelligent Manufacturing and New Energy Integration

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Abstract: This paper deeply discusses the commercial application scenarios and development paths of the integration of intelligent manufacturing and new energy. By summarizing the basic knowledge of intelligent manufacturing and new energy, the importance and motivation of the integration of the two are highlighted. This paper analyzes the application status of intelligent manufacturing and new energy in automobile manufacturing, construction industry and energy Internet, and puts forward the path of technological innovation, policy promotion, business model innovation and social cooperation for the future development. At the same time, the research points out the technical challenges, policy challenges, business model challenges and social collaboration challenges faced by the integration of intelligent manufacturing and new energy, and provides specific countermeasures for each challenge. Finally, the paper summarizes the results and prospects the future developments.

Keywords: Intelligent Manufacturing; New Energy; Integration; Commercial Application; Development Path.

1. Introduction

1.1. Overview of intelligent Manufacturing and new energy

With the rapid development of science and technology, intelligent manufacturing and new energy have gradually become the focus of global attention. Intelligent manufacturing, with its high efficiency and precise characteristics, has brought great changes for manufacturing; and new energy, as a clean and renewable energy, provides strong support for the global energy structure transformation. The integration of the two will not only help to enhance the competitiveness of the manufacturing industry, but also promote the optimization of the energy structure and achieve sustainable development. Intelligent manufacturing is to use advanced information technology, automation technology, artificial intelligence, etc., to carry out intelligent transformation of the manufacturing process, to realize the automation, intelligence and high efficiency of the manufacturing process. By introducing advanced production equipment, information system and manufacturing technology, it improves production efficiency, reduces production costs, improves product quality, and meets the personalized and diversified market demand. New energy, also known as renewable energy, refers to new energy other than traditional energy. Mainly including solar energy, wind energy, water energy, biomass energy, etc. These energy sources are clean and renewable, providing a new option for the transformation of the global energy structure. The development and application of new energy can not only reduce the dependence on traditional energy and reduce environmental pollution, but also promote the development of related industries and create more job opportunities. At the same time, the application of new energy is also in line with the concept of sustainable development, providing the power for the sustainable development of the global economy[1].

1.2. Background and significance of fusion

The integration of intelligent manufacturing and new energy is an inevitable trend of global industrial transformation and energy structure transformation. With the continuous development of information technology, automation technology, artificial intelligence and other technologies, intelligent manufacturing technology is also making continuous progress, providing strong support for the transformation and upgrading of the manufacturing industry. At the same time, with the transformation of the global energy structure, new energy has become an important direction of the future energy development. Governments and enterprises of all countries are actively promoting the development and application of new energy. Therefore, the integration of intelligent manufacturing and new energy can not only improve production efficiency, reduce energy consumption and environmental pollution, but also promote sustainable development and create new business models, and inject new impetus into the sustainable development of the global economy.

1.3. Research purpose and structure of the paper

This paper aims to deeply discuss the commercial application scenarios and development path of the integration of intelligent manufacturing and new energy. First, by summarizing the basic concepts, characteristics and relevance of intelligent manufacturing and new energy, the potential of the integration of the two is revealed. Secondly, combined with the potential applications and case analysis of various industries, the business model and practical application effect of intelligent manufacturing and new energy integration are discussed. On this basis, further suggestions on the development path are put forward, including technological innovation, policy promotion, business model innovation and social collaboration. Finally, summarize the findings and prospect future development to provide valuable reference for

research and practice in related fields[2].

2. Current situation of the integration of intelligent manufacturing and new energy

2.1. The development status of intelligent manufacturing

The development status quo of intelligent manufacturing is in a rapid development stage. With the progress of science and technology and the transformation of global manufacturing industry, intelligent manufacturing has become an important trend in the development of manufacturing industry. Intelligent manufacturing technology has been widely used. Many enterprises began to apply the intelligent manufacturing technology in the production process, and realized the automation, intelligence and high efficiency of the manufacturing process. The application of these technologies not only improves production efficiency, reduces production costs, but also improves product quality and meets the personalized and diversified market demands. Secondly, the intelligent manufacturing technology is constantly updated. With the continuous progress of information technology, intelligent manufacturing technology is also constantly updated, promoting the transformation and upgrading of the manufacturing industry. For example, the application of new technologies such as artificial intelligence, big data and the Internet of Things has provided more possibilities and innovation space for intelligent manufacturing. In addition, intelligent manufacturing technology also promotes the innovation and development of related industries. The application of intelligent manufacturing technology is not only limited to the manufacturing industry itself, but also involves the development of related industries. For example, intelligent manufacturing technology can be applied to energy, environmental protection, medical care and other fields, providing new impetus and support for the development of these fields. However, the development of intelligent manufacturing technology also faces some challenges. For example, technology changes rapidly and requires constant updates; data security and privacy issues also need to be addressed by[3]. Therefore, in the future, we need to strengthen technology research and development and innovation, promote the continuous progress of intelligent manufacturing technology, and provide strong support for the sustainable development of the manufacturing industry.

2.2. Development status of new energy

With the transformation of global energy structure and the improvement of environmental protection awareness, new energy has become an important direction of energy development in the future. First of all, new energy technologies have been widely used. New energy technologies such as solar energy, wind energy, water energy and biomass energy have been widely used, providing a new choice for the transformation of the global energy structure. The application of these technologies not only improves energy efficiency, but also reduces environmental pollution, and provides strong support for sustainable development. Second, the new energy industry continues to grow. With the wide application of new energy technology and the continuous expansion of the market, the new energy industry

has developed rapidly. Many enterprises began to enter the new energy field to promote the development and innovation of the new energy industry. At the same time, the government has also increased the support for the new energy industry, providing strong support for the development of the new energy industry. In addition, new energy technologies continue to innovate and develop. With the continuous progress of science and technology, new energy technology is also constantly innovating and developing. For example, solar panels are becoming more efficient, and the reliability of wind power technology also increases. The innovation and development of these technologies have provided more possibilities and innovation space for the application of new energy. However, the development of new energy sources also faces some challenges. For example, new energy technology are more expensive and need more financial and technical support; the development and utilization of new energy is more difficult and requires more technological innovation and research and development. Therefore, in the future, technology research and development and innovation should be strengthened to promote the continuous progress of new energy technologies, and provide strong support for the transformation of the global energy structure[4].

2.3. The integration situation of intelligent manufacturing and new energy

The integration of intelligent manufacturing and new energy is widely used in various fields. In the automobile manufacturing industry, the application of intelligent manufacturing technology has promoted the development of new energy vehicles such as electric vehicles and hybrid electric vehicles, and also improved the production efficiency and quality of[5]. In the construction industry, the intelligent manufacturing technology can realize the energy saving and intelligent control of the buildings, and reduce the energy consumption and environmental pollution. In the field of energy Internet, the application of intelligent manufacturing technology can realize the efficient utilization and optimal allocation of energy, and improve the efficiency of energy utilization. The integration of intelligent manufacturing and new energy technology innovation is constantly emerging. With the continuous progress of information technology and the continuous development of new energy technology, the integration of intelligent manufacturing and new energy technology innovation is constantly emerging. For example, the application of new technologies such as artificial intelligence, big data and the Internet of Things provides more possibilities and innovation space for the integration of intelligent manufacturing and new energy. At the same time, related industries are also constantly strengthening technology research and development and innovation, and promote the continuous progress of the integration of intelligent manufacturing and new energy technology. However, the integration of intelligent manufacturing and new energy also faces some challenges. For example, technology changes rapidly and requires new technologies; data security and privacy issues also need to be appreciated.

3. Commercial application scenarios of the integration of intelligent manufacturing and new energy

3.1. Application of intelligent manufacturing and new energy in automobile manufacturing

Intelligent manufacturing and new energy are deeply integrated, jointly shaping a new future of the global automobile industry. The rapid development of science and technology and the increasing awareness of environmental protection make the combination of the two become the inevitable trend of the automobile manufacturing industry. Intelligent manufacturing technology has injected the new vitality of automation and intelligence into the automobile manufacturing, greatly improving the production efficiency and quality while reducing the cost. New energy technology provides a more environmentally friendly and efficient power source for automobile manufacturing. Its wide application is not only a deep concern for the environment, but also a powerful practice of sustainable development. Intelligent manufacturing and new energy technology have shown great potential in the optimization of automobile production process and the efficiency improvement of energy utilization. In addition, the integration of the two also brings innovative business models and unlimited possibilities for the industry. Automobile manufacturers can now rely on these advanced technologies to create intelligent and environmentally friendly new energy vehicles more in line with the needs of modern consumers, so as to stand out from the fierce market competition[6].

3.2. Application of intelligent manufacturing and new energy in the construction industry

The application of intelligent manufacturing and new energy in the construction industry is changing the face of the construction industry and having a profound impact on people's way of life. With the progress of science and technology and the improvement of environmental awareness, the integration of the two has become an important trend in the development of the construction industry. Intelligent manufacturing technology brings higher production efficiency and lower production costs to the construction industry. Through the introduction of advanced automatic production lines and intelligent production management system, construction enterprises can significantly improve the efficiency and quality of building materials processing and building structure construction, and reduce production costs. The application of new energy provides new power for the construction industry. With the improvement of environmental awareness and the transformation of energy structure, new energy has become an important direction of building energy in the future. By introducing new energy technologies, such as solar and wind energy, construction companies can develop more environmentally friendly, efficient and sustainable buildings. These buildings not only meet environmental requirements, but also reduce energy consumption and environmental pollution to contribute to sustainable development. In the construction industry, the integration of intelligent manufacturing and new energy is also reflected in energy conservation, emission reduction and intelligent management. Through the introduction of

intelligent manufacturing technology and new energy technology, construction enterprises can realize the energy saving and intelligent control of buildings, reduce energy consumption and environmental pollution[7].

3.3. Application of intelligent manufacturing and application of new energy in energy Internet

The application of intelligent manufacturing and new energy in the energy Internet is promoting the transformation of the energy structure and the improvement of energy utilization efficiency. With the progress of science and technology and the transformation of the global energy structure, the integration of intelligent manufacturing and new energy has become an important direction of the development of the energy Internet. Intelligent manufacturing technology can help energy enterprises to achieve fine management of energy production, transmission, distribution and other links, improve energy utilization efficiency, while reducing energy consumption and environmental pollution. New energy technology provides new power for the transformation of energy structure, and meets the requirements of environmental protection while reducing energy consumption and environmental pollution. In the energy Internet, the integration of intelligent manufacturing and new energy is also reflected in the intelligent management of energy equipment and the intelligent operation of energy transactions. By the introduction of intelligent manufacturing technology and new energy technology, energy enterprises can improve the efficiency and security of equipment operation, and realize the intelligent management of energy trading, and improve the efficiency and transparency of energy trading. In addition, the integration of intelligent manufacturing and new energy also brings new business models and innovation opportunities for the energy Internet. Energy enterprises can develop more intelligent and environmentally friendly energy products and services to meet consumers' demand for environmental protection and efficient[8].

4. Development path of the integration of intelligent manufacturing and new energy

4.1. Technological Innovation Path

Technological innovation promotes the continuous progress of intelligent manufacturing and new energy technology, and provides a powerful power for the integrated development. With the rapid development of science and technology, new intelligent manufacturing technology and new energy technology continue to emerge, which has brought great changes to the manufacturing industry and the energy industry. By introducing advanced intelligent manufacturing technology and new energy technology, enterprises can optimize the production process, improve the production efficiency and quality, reduce energy consumption and environmental pollution, and achieve sustainable development. As consumers have a growing demand for environmental protection and intelligence, the manufacturing industry and the energy industries need to constantly innovate to meet the market demand. By introducing new intelligent manufacturing technology and new energy technology, enterprises can develop more intelligent and environmentally friendly products and services to meet the needs of consumers

and promote the development of the industry. In addition, technological innovation also provides more business models and innovation opportunities for the integration of intelligent manufacturing and new energy. By the introduction of new intelligent manufacturing technology and new energy technology, enterprises can develop more intelligent and environmentally friendly products and services to meet the needs of consumers and promote the development of the industry[9].

4.2. Policy Promotion Path

The government formulates relevant policies and regulations, the government provides strong support and guarantee for the integration of intelligent manufacturing and new energy. First, policy promotion can promote the research and development and application of intelligent manufacturing and new energy technologies. The government can provide financial support, tax incentives and other policies and measures, to encourage enterprises to increase the research and development of intelligent manufacturing and new energy technologies, so as to promote the continuous progress and application of technology. At the same time, the government can also strengthen the supervision and promotion of new technologies and new products, and improve the market awareness and acceptance. Second, policy promotion can optimize the energy mix and promote the development of clean energy. The government can encourage enterprises to increase the research and development and application of clean energy through the development of clean energy development plan and the increase of renewable energy subsidies and other policies and measures, so as to promote the optimization of the energy structure and the development of clean energy. This helps to reduce the dependence on traditional fossil fuels and reduce environmental pollution and greenhouse gas emissions. In addition, policy promotion can also promote the business model innovation of intelligent manufacturing and new energy. By providing policy support and guidance, the government can encourage enterprises to explore new business models and service models, such as energy Internet and smart home, so as to provide consumers with more convenient and intelligent energy service experience.

4.3. Business model innovation path

The integrated development of intelligent manufacturing and new energy needs not only technological innovation and policy promotion, but also the innovation of business model. First of all, business model innovation can promote the wide application of intelligent manufacturing and new energy technology. By exploring new business models and service models, enterprises can develop more intelligent and environmentally friendly products and services to meet the needs of consumers and promote the development of the industry. At the same time, business model innovation can also reduce the cost and risk of enterprises, and improve the competitiveness and profitability of enterprises. Secondly, business model innovation can promote the integrated development of intelligent manufacturing and new energy. By introducing new business models and service models, enterprises can optimize production processes, improve production efficiency and quality, and reduce energy consumption and environmental pollution. At the same time, business model innovation can also promote the deep integration of intelligent manufacturing and new energy

technology, and promote the development and innovation of the industry.

4.4. Social collaboration path

Socialized cooperation is one of the key ways to promote the integrated development of intelligent manufacturing and new energy. First, social collaboration can promote the research and development and application of intelligent manufacturing and new energy technologies. By strengthening the cooperation between enterprises, universities and scientific research institutions, the sharing of technical resources and complementary advantages can be realized, and the efficiency and success rate of technology research and development can be improved. At the same time, socialized cooperation can also promote the transformation and application of technological achievements, and promote the wide application of intelligent manufacturing and new energy technology. Secondly, socialized cooperation can promote the coordinated development of intelligent manufacturing and new energy industry. By strengthening the cooperation between the upstream and downstream enterprises of the industrial chain, the optimal allocation and efficient utilization of resources can be realized, and the production costs and energy consumption can be reduced. In addition, social collaboration can also promote international cooperation in the field of intelligent manufacturing and new energy. By strengthening international technical exchanges and cooperation, advanced technology and experience can be introduced to promote the rapid development of intelligent manufacturing and new energy technology in China[10].

5. Challenges and countermeasures of the integration of intelligent manufacturing and new energy

5.1. Technical Challenges and Countermeasures

The integration of intelligent manufacturing and new energy is facing the challenge of technological renewal. Due to the rapid change of science and technology, intelligent manufacturing and new energy technology are being rapidly updated. In order to remain competitive, enterprises need to constantly introduce new technologies and new equipment to improve production efficiency and product quality. In this process, how to solve the stability and reliability of intelligent manufacturing technology, as well as the cost and efficiency of new energy technology, has become an unavoidable challenge for enterprises. To effectively respond to these technological challenges, companies need to take a series of countermeasures. Strengthening technology research and development and innovation is the key, through the continuous introduction of high-quality technical personnel, the technical level and overall competitiveness of enterprises can be significantly improved. It is also an important strategy to establish a close technical cooperation platform with universities and scientific research institutions, so that we can gather various forces to jointly develop new technologies and new equipment, in order to improve production efficiency and product quality.

5.2. Policy Challenges and Countermeasures

Policy support and guidance have an inestimable importance in the development of the integration of intelligent manufacturing and new energy. But in practice, problems such

as policy uncertainty, opacity and instability often bring trouble to enterprises. To effectively respond to these policy challenges, companies need to adopt a range of strategies. Enterprises need to keep close attention to policy dynamics to ensure timely understanding of the possible impact of policy changes on enterprises, so as to flexibly adjust their business strategies. In addition, communication with government departments is also very important. By actively reflecting their own problems and difficulties, enterprises can win more policy support and help. In order to reduce the impact of policy changes on enterprises, it is also essential to establish a policy response mechanism and formulate contingency plans to deal with policy changes.

5.3. Business Model Challenges and countermeasures

With the progress of technology and the rapid change of market demand, the traditional business model has been unable to meet the needs of the integrated development of intelligent manufacturing and new energy. To cope with this challenge, companies need to actively explore new business models. Enterprises need to innovate business models and explore new business models such as platform and sharing, so as to adapt to market changes and technological development trends. Through the platform mode, enterprises can integrate the industrial chain resources, realize resource sharing and complementary advantages, and improve the overall competitiveness. Enterprises also need to strengthen the industrial chain cooperation, and jointly explore new business models with the upstream and downstream enterprises. By establishing close cooperative relations with suppliers and distributors, enterprises can jointly respond to market changes and achieve resource sharing and mutual benefit and win-win results. Finally, enterprises need to pay attention to user needs and experience, to meet user needs as the goal, and constantly optimize products and services. Through an in-depth understanding of user needs, enterprises can provide more personalized and intelligent products and services to improve user satisfaction and loyalty.

5.4. Social collaboration challenges and countermeasures

With the rapid progress of intelligent manufacturing and new energy technology, the cooperation between enterprises has become increasingly important. However, in practice, social collaboration faces a series of challenges, such as information asymmetry, lack of trust and immature cooperation mechanism. In order to effectively respond to these challenges, enterprises need to adopt a series of comprehensive strategies in the process of integrating intelligent manufacturing and new energy. Strengthening the information sharing among enterprises is the key. Through the establishment of an information exchange platform, the free circulation and sharing of information can be ensured, so as to reduce the risks caused by information asymmetry. In addition, the construction of the trust mechanism is also crucial, which requires deepening communication and cooperation between enterprises, and gradually establish a solid foundation of mutual trust, so as to reduce the potential crisis caused by the lack of trust. At the same time, improving the cooperation mechanism should not be ignored. Clarifying the cooperation objectives and respective responsibilities, and

establishing clear cooperation norms and procedures are the cornerstone to ensure the smooth progress of cooperation.

6. Conclusion

Through in-depth research, we find that the integration of intelligent manufacturing and new energy faces four major challenges: technology, policy, business model and social collaboration. Technical challenges require enterprises to strengthen R&D and innovation to enhance competitiveness; policy challenges require enterprises to pay close attention to policy dynamics, communicate with government departments and establish response strategies; business model challenges to innovate business models, strengthen industrial chain cooperation and pay attention to user needs; social cooperation challenges encourage enterprises to strengthen information sharing, establish trust and improve cooperation. To cope with these challenges, enterprises need to take comprehensive measures to promote the integrated development of intelligent manufacturing and new energy. The future research can further study the technical challenges and countermeasures of the integration of intelligent manufacturing and new energy, explore new technical paths and innovation modes; study the influence of policies on the integration of intelligent manufacturing and new energy, put forward more effective policy suggestions and measures; explore new business models and cooperation modes, promote the integrated development of intelligent manufacturing and new energy; strengthen the research of socialized cooperation, and establish closer cooperation and cooperation mechanism.

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