

Exploration and Future Development Direction of Electrical Engineering and Automation in Office Property Management

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Abstract: The application of electrical automation technology in office property management has become an important trend in the industry. This paper discusses the exploration and future development direction of electrical engineering and automation in the property management of office buildings. By using advanced sensor technology, intelligent control algorithm, and Internet of Things technology, the electrical automation system can realize intelligent monitoring, control, and management of the internal equipment and facilities of office buildings, improve the energy efficiency, safety, and comfort of office buildings, and reduce the cost of property management and human investment. With the continuous development and application of new technologies such as artificial intelligence, big data analysis, and sustainable development, the role of electrical automation technology in office property management will become increasingly important. The key development directions include strengthening technology standardization and normalization, optimizing user experience and demand customization, and strengthening talent training and technology popularization. Through continuous technological innovation and application practice, electrical automation technology will bring more opportunities and challenges to office property management, and promote the intelligent, green, and sustainable development of the industry.

Keywords: Electrical automation; Office building; Property management; Energy efficiency; Standardization

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1. Introduction

With the rapid development of science and technology and the continuous progress of the social economy, office property management is facing more and more challenges and opportunities. As one of the key areas of office building management, electrical automation technology is increasingly important in improving office building management efficiency, reducing energy consumption, and improving user experience. With the characteristics of intelligence, efficiency, and convenience, electrical automation technology has become an important means

and tool to improve the management level and quality of office buildings.

This paper will focus on the exploration and future development direction of electrical automation in office property management. The paper will first review the application status of electrical automation technology in office property management, and analyze its role and value in improving management efficiency, energy conservation and emission reduction, and improving safety. Then, the paper will discuss the challenges and problems existing under the current technical level, including the challenges of cost, technical compatibility, data security, and so on, and put forward the corresponding solutions and countermeasures. Finally, the study will look forward to the future development direction of electrical automation technology in office property management, including strengthening technology standardization and standardization, optimizing user experience and demand customization, strengthening talent training and technology popularization, and so on, to provide a reference for the intelligent, green and sustainable development of the industry. Through the discussion of this paper, the study hopes to provide some ideas and enlightenment for promoting the application and development of electrical automation technology in office property management.

2. Application of electrical automation in office property management

2.1. Intelligent energy management system

The intelligent energy management system uses advanced sensor technology and intelligent control algorithms to realize real-time monitoring, analysis, and regulation of energy consumption in office buildings. Through the integrated energy management software, property managers can understand the energy use of office buildings in real-time, including the consumption of power, water, gas, and other resources. Based on these data, the system can intelligently adjust the operation mode and time of air conditioning, lighting, ventilation, and other equipment to minimize energy waste and improve energy efficiency.

2.2. Automatic security system

The automatic security system is an indispensable part of office property management. Using video monitoring, intrusion alarms, access control systems, and other technologies, the automatic security system can monitor the security situation inside and outside the office building in real-time, and timely alarm and take corresponding measures in case of abnormal conditions. At the same time, the system can also improve the security and management efficiency of the office building through face recognition, intelligent access control, and other functions, and effectively prevent security risks such as theft and intrusion.

2.3. Intelligent building management system

The intelligent building management system is a master of electrical automation technology. It integrates energy management, security monitoring, equipment maintenance, and other functions, and realizes the comprehensive intelligent management of the whole office building. This system can not only improve the operation efficiency and user experience of office buildings but also provide comprehensive data support and decision-making reference for property managers to help them better manage and operate office buildings.

Through the above applications, electrical automation technology is bringing revolutionary changes to the property management of office buildings, improving management efficiency, reducing costs, enhancing safety, and laying a solid foundation for the sustainable development of office buildings. In the future, with the continuous progress of technology and the continuous expansion of application scenarios, the role of electrical

automation technology in office property management will become more and more important, bringing more opportunities and challenges to the development of the industry.

3. Technical standardization and specification

In the development and application of electrical automation technology, technical standardization and standardization plays a vital role. Standardization can unify the technical specifications and requirements in the industry, improve the compatibility and interoperability between equipment, reduce the cost of system integration operation and maintenance, and promote the promotion and application of technology.

3.1. Uniform technical standards

Formulating unified technical standards is one of the important ways to promote the development and application of electrical automation technology. By formulating unified hardware interface standards, communication protocol standards, data format standards, and so on, the difficulty of integration between devices can be reduced, and the interoperability and flexibility of the system can be improved. At the same time, standardization can also promote cooperation and exchange among all parties in the industry, and promote technology sharing and innovation.

3.2. Standardize the technical process

Standardizing the technical process is an important guarantee to ensure the smooth implementation of the technology. By formulating a unified technology implementation process and standard operating procedures, the implementation process of technical projects can be standardized and the quality and efficiency of projects can be improved. At the same time, standardization can also reduce the risk and error in the process of project implementation and ensure the smooth completion of the project.

3.3. Improve product quality

Standardization can promote the improvement of product quality and protect the interests and rights of users. The development of a unified product quality standard and certification mechanism can standardize the product design, production, and testing process, and ensure that the product meets the relevant technical requirements and performance indicators. At the same time, standardization can also improve the reliability and stability of products and reduce the use risk and cost of users.

3.4. Promote the development of the industry

Technical standardization and normalization not only help to improve product quality and user satisfaction but also promote the development and progress of the entire industry. By formulating unified industry standards and norms, the competitiveness and influence of the industry can be improved, the innovation and application of technology can be promoted, and the healthy and sustainable development of the industry can be promoted.

To sum up, technical standardization and normalization are important means and guarantees to promote the development and application of electrical automation technology. Strengthening standardization work and formulating unified technical standards and specifications will help to improve the promotion and application effect of technology and promote the development and progress of the industry.

4. Current technical level and the challenges

Although electrical automation technology has great potential in office property management, its application still faces some challenges and limitations.

4.1. Cost issues

The deployment of an electrical automation system requires a certain amount of investment, including the cost of hardware equipment, software development, system integration, and so on. Especially for some small and medium-sized property management companies or office building owners with limited resources, this may be a big burden, leading them to be discouraged from making investment decisions.

4.2. Technical compatibility

As electrical automation technology involves a variety of different equipment and systems, the compatibility between them has become a problem. The equipment produced by different manufacturers may adopt different communication protocols and interface standards, resulting in certain difficulties in system integration and upgrading. This requires all parties in the industry to strengthen standardization cooperation and promote the unification and interoperability of technologies.

4.3. Data security and privacy protection

The intelligent system needs a lot of data support, including user information, equipment operation data, and so on. However, data security and privacy protection have become a problem that cannot be ignored. Once the system is attacked by hackers or data leakage, it will have a great impact on the security of office buildings and the trust of tenants. Therefore, strengthening data security and privacy protection has become one of the necessary conditions for the development of electrical automation technology.

4.4. Technical update and maintenance

With the continuous progress of science and technology, electrical automation technology is also constantly updated, and the old equipment and systems may face the risk of technology obsolescence. Therefore, property management companies need to update and maintain the technology in time, but they also need to invest the corresponding human and financial resources.

Despite these challenges, with the continuous progress of technology and the continuous expansion of application scenarios, the study believes these problems can be gradually solved, and the application prospect of electrical automation technology in office property management is still broad.

5. User experience and demand customization

In the application of electrical automation technology, user experience, and demand customization are very important. Considering the actual needs and usage habits of users, providing personalized customized solutions can improve the acceptance and use effect of the system, and enhance user satisfaction and loyalty.

5.1. Understand user needs

When designing and implementing an electrical automation system, the personnel first need to understand the actual needs and usage scenarios of users. This is through communication and exchange with users, collecting

users' feedback and suggestions, and understanding their expectations for system functions and performance, as well as the deficiencies of the existing system. Only by fully understanding the needs of users can the personnel design customized solutions that meet the expectations of users.

5.2. Customized solutions

According to the actual needs and usage scenarios of users, providing personalized customized solutions is the key to achieving a good user experience. Through flexible system design and function configuration, it can meet the different needs and preferences of users. For example, for different types of office buildings, different energy management schemes and security monitoring schemes can be provided. Customized design can be carried out according to the specific situation of users to improve the applicability and operability of the system.

5.3. Optimize the user interface and interactive experience

The design of the user interface and interactive experience directly affect users' experience and satisfaction with the system. Therefore, researchers need to focus on optimizing the user interface and interaction design of the system, which is simple, intuitive, and easy to operate. Provide clear operation guidance and friendly user feedback, reduce the learning cost and difficulty of users, and improve the operation efficiency and satisfaction of users.

Continuous improvement and optimization of user experience is a dynamic process, which needs continuous improvement and optimization. By collecting the user's use data and feedback, the system's function and performance are continuously improved and optimized to improve the stability and reliability of the system. At the same time, respond to changes in user needs promptly, flexibly adjust the configuration and functions of the system, maintain a close fit between the system and user needs, and maintain the continuous improvement of user satisfaction.

To sum up, paying attention to user experience and demand customization is one of the keys to the successful application of electrical automation technology. Only by giving full consideration to users' needs and usage habits and providing personalized customized solutions, can the system achieve a good user experience, improve user satisfaction and loyalty, and promote the wide application and development of technology.

6. Personnel training and technology popularization

In the process of promoting the application and development of electrical automation technology, talent training, and technology popularization play a vital role. Cultivating professional talents and promoting technical knowledge can not only meet the market demand for technical talents but also promote the wide application and promotion of technology and promote the development and progress of the industry.

6.1. Construction of education and training system

The establishment of a perfect electrical automation technology education and training system is the basis for training professionals and promoting technical knowledge. Strengthen the teaching and training of electrical automation technology in colleges and universities, vocational colleges, and other educational institutions, provide systematic and professional courses and training projects, and cultivate professionals who meet the market demand.

6.2. Industry certification and qualification certification

Promoting the industry certification and qualification certification system of electrical automation technology is an important means to ensure the quality and professional ability of technical personnel. Establish industry standards and certification mechanisms, assess the technical level and ability of employees, provide professional and standardized certification services, and improve the professional quality and competitiveness of technical personnel.

6.3. Technical training and practical application

Strengthen the training and practical application of electrical automation technology, and improve the practical operation ability and problem-solving ability of employees. Through the organization of training courses, technical exchanges, and other forms, to impart technical knowledge and practical experience to practitioners, improve their working ability and innovation ability.

6.4. Promotion and application demonstration project

Build demonstration projects for the promotion and application of electrical automation technology, and provide opportunities for practitioners to practice and accumulate experience. By carrying out demonstration projects and application cases, the application effect and economic benefits of the technology are displayed to the inside and outside of the industry, attracting more talents to devote themselves to the field of electrical automation, and promoting the popularization and application of technology.

6.5. Cooperation with industry associations and organizations

Strengthen the cooperation between industry associations and organizations to jointly promote the popularization and application of electrical automation technology. Promote the exchange and cooperation of talents inside and outside the industry, promote technological innovation and progress, and promote the healthy and sustainable development of the industry by organizing technical exchanges, academic seminars, and other forms.

To sum up, talent training and technology popularization are important guarantees to promote the application and development of electrical automation technology. Strengthening education and training, promoting industry certification, providing technical training, carrying out demonstration projects, strengthening industry cooperation and other measures will help to cultivate more professionals, promote and popularize electrical automation technology, and promote the development and progress of the industry.

7. Future development trends and direction

7.1. Application of artificial intelligence

In the future, artificial intelligence technology will become an important driving force of electrical automation in office property management. Through machine learning and deep learning algorithms, intelligent systems can continuously optimize their operation strategies to adapt to different environments and needs. For example, the intelligent prediction model based on big data analysis can help property managers predict energy consumption and equipment failures more accurately, take corresponding measures in advance, and reduce maintenance costs and risks.

7.2. Application of big data analysis

Big data analysis technology will also play an important role in the field of electrical automation. By collecting, storing, and analyzing a large amount of data, property managers can better understand the operation status of office buildings and user needs, and provide data support for decision-making. For example, by analyzing user behavior data, the operation mode of air conditioning, lighting, and other equipment can be optimized to improve user experience and energy efficiency.

7.3. Sustainable development considerations

In the future, sustainable development will become an important consideration of electrical automation in office property management. With global greenhouse gas emissions and energy consumption becoming increasingly prominent, property managers will pay more and more attention to how to achieve energy conservation and environmental protection through electrical automation technology. Therefore, in the process of system design and operation, it is necessary to pay attention to the renewable utilization and recycling of energy to reduce the impact on the environment.

7.4. Technology integration and innovation

In the future, electrical automation technology will be further integrated and innovated with other emerging technologies. For example, combining with the Internet of Things, blockchain, 5g, and other technologies can realize more efficient equipment interconnection and data transmission, and further improve the intelligence level and operation efficiency of the system. At the same time, related personnel also need to encourage and support innovative enterprises and teams, constantly promote the development and application of electrical automation technology, and bring more innovative solutions to office property management.

To sum up, the application of electrical automation technology in office property management will be more extensive and in-depth in the future, providing more possibilities and opportunities for the sustainable development and intelligence of office buildings.

8. Conclusion and prospect

The application of electrical automation technology in the property management of office buildings has achieved remarkable results, improved management efficiency, reduced costs, enhanced safety, and made a positive contribution to the sustainable development of office buildings. However, people should also be soberly aware that electrical automation technology still faces some challenges and restrictions, which require the joint efforts of all parties in the industry to strengthen cooperation, promote the innovation and application of technology, and further improve the level and quality of office property management.

In the future, with the continuous development and application of new technologies such as artificial intelligence, big data analysis, and sustainable development, it is believed that the role of electrical automation technology in office property management will become more and more important, bringing more opportunities and challenges to the development of the industry. The researchers are looking forward to seeing more innovative solutions and application scenarios, which will bring greater value and benefits to the management and operation of office buildings, and realize the intelligent, green, and sustainable development of office property management.

Disclosure statement

The author declares no conflict of interest.

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