

Application of Internet of Things technology in elevator maintenance management

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Abstract: With the continuous development of science and technology, the overall development level of China's construction industry has been greatly improved. As an essential element of modern high-rise buildings, elevators can greatly facilitate people's travel. However, as an electromechanical device, there may be some problems in the use of the elevator. Therefore, the safety of the elevator must be focused on by people. We should do a good job in elevator maintenance management to ensure the safe operation of the elevator. The Internet of Things (IoT) technology, as a popular auxiliary management technology, can greatly improve the form and content of elevator maintenance management, and plays an important role in promoting the quality of elevator maintenance management. In view of this, this paper will analyze the application of Internet of Things technology in elevator maintenance management, and propose some strategies for your reference.

Keywords: Internet of Things technology; Elevator maintenance management; Application strategy

1. Use scenarios of Internet of Things technology in different elevators

1.1 Resident elevator

When installing elevators in residential buildings, we should pay attention to the confidentiality of elevators. To this end, we can try to apply the Internet of Things technology to elevator maintenance management. When the owner takes the elevator, he can use the elevator card to select the button of the corresponding floor. When he arrives at the corresponding floor, he will automatically open the corresponding floor door. If you want to achieve this function, you need to use the Internet of Things technology to combine user information and elevator database to ensure the privacy of residents' elevators. For some outsiders, we can provide them with some temporary cards, which can be used to enter the corresponding floor. If visitors do not have temporary cards or elevator cards, they cannot enter the elevator. Even if they enter the elevator, they cannot press the corresponding floor button.

1.2 School elevator

In the school elevator, we can combine student information and elevator data through the Internet of Things technology. When students take the elevator, they can swipe their campus card. The elevator can provide services on different floors for students by reading their personal information. In addition, when reading information, the elevator can also send the information of the student card to the monitoring center of the school, so that teachers can better understand the students' trends.

1.3 Mall elevator

The elevator in the mall is very convenient and can help customers to carry out shopping activities more efficiently. Customers in the underground parking lot can also use the parking card to control the elevator to reach the corresponding floor, and the card will also contain some temporary information of customers. Some customers usually go to fixed stores for consumption. We can use the Internet of Things technology to add some information to the customer's elevator card. When they come to the mall to swipe their cards, the corresponding store will receive the corresponding message. At this time, the clerk can make preparations in advance to improve the customer's shopping experience. Not only that, when customers swipe their elevator cards, the elevators can also use intelligent voice to broadcast, helping them better understand the flow of people on different floors. In addition, stores in the mall can also introduce corresponding activity data into the elevator system, so that customers can better understand the preferential activities of different stores. After customers' consumption, the inner screen of the elevator can display the location of their vehicles for customers to help them find their own vehicles more quickly.

1.4 Office building elevator

The elevators in the office building are mainly used by the office staff of companies on each floor. By introducing the Internet of Things technology into the elevator maintenance management system, it can provide some managers of enterprises with VIP smart cards, and these users with VIP cards can get to the corresponding floors first. For some companies with abundant funds and large scale, you can try to contract some elevators, so that they can go directly to the corresponding floor from the ground floor in a fixed time period, which can greatly save the waiting time of employees.

1.5 Hospital elevator

Generally speaking, the elevator in the hospital will be equipped with corresponding elevator management personnel, who will perform corresponding key operations for different patients according to their needs and urgency to help them reach the corresponding floor faster. Not only that, for some patients who are not familiar with the location of the consulting room, we can introduce the Internet of Things technology to play the internal layout of the hospital, the introduction of doctors from various departments, hospital navigation and other contents on the display screen inside the elevator, so as to help patients find their corresponding departments faster, which will greatly improve their medical treatment efficiency.

2. Key points analysis of elevator maintenance management installation

2.1 Effective use of advanced technology

The elevator maintenance management system itself is very comprehensive, so many technical problems may occur during the installation process, which will affect the normal operation of the elevator. In order to avoid the above situations, when we install the elevator maintenance management system, we should reasonably control the mechanical installation of the entire elevator. For example, BIM technology can greatly promote the installation efficiency of elevator equipment. Therefore, we can try to introduce BIM technology into the installation process to continuously improve the installation effect of mechanical equipment. Moreover, we can use the 3D imaging function of BIM technology to better monitor the status of elevator operation, which plays an important role in improving the level of elevator maintenance management.

2.2 Installation of electrical equipment

If we want to ensure the safety of the elevator and enhance its stability during operation, we should do a good job in the installation of the corresponding power distribution equipment, which plays an important role in the safe operation of the elevator in the future. When carrying out the installation of corresponding electrical equipment, we should deeply understand the working principle of the distribution box, its basic structure and operation mode, and master different installation forms. In combination with different types of buildings, we can choose different distribution modes, equipment, and systems to ensure the normal operation of elevator mechanical equipment. In addition, during installation, we should pay attention to the installation position of the distribution box to ensure that it is a certain distance from the ground, and do a good job in strengthening the corresponding distribution box to ensure its normal and safe operation.

2.3 Convenience

It has become a popular trend to use mechanical chips to deal with problems in the operation of elevator equipment. In order to further improve the production efficiency of the factory, we must simplify some complex work, which requires more reasonable application of mechanical control systems. The core of mechanical control is the mechanical chip. Through the corresponding algorithm, the efficiency and level of the elevator production plant can be greatly improved to meet their daily production needs, and the convenience of elevator production can be greatly improved.

2.4 Extremely strong operability

The biggest role of elevators is to better serve human beings. Therefore, when carrying out the corresponding mechanical design work, it should be ensured that they have strong operability, so that the service efficiency of elevators can be greatly improved. By applying the Internet of Things technology to elevator maintenance management, the elevator can better understand the meaning that people want to express, so as to carry out corresponding autonomous learning, and the elevator operating system will become more intelligent. When there are some system faults in the elevator, it can find out the causes of the faults by means of independent diagnosis, and then put forward the corresponding maintenance scheme. In this way, the elevator equipment can better adapt to a more diverse working environment and better complete various instructions.

3. Analysis on the Application Advantages of Elevator Internet of Things

At present, China's big data technology has been developed very efficiently, which provides a great help for the application of Internet of Things technology to elevators. It can enable enterprises and relevant departments to better grasp the elevator operation situation in a timely manner based on the corresponding data, which plays an important role in improving the level of elevator maintenance management. Through the reasonable analysis of elevator data, the elevator operation report can be formed, which plays an important role in the future elevator maintenance management. The main advantages of applying IoT technology to elevator maintenance management are as follows:

3.1 Big data sharing

With the combination of Internet of Things technology and big data technology, we can create an Internet of Things database for

elevator maintenance management. The customers under its management include enterprises and cooperative government departments. By sharing the corresponding big data information, we can send different underlying information to the data center, and then carry out corresponding processing, so that the public can master the real-time scene of the elevator, This plays an important role in promoting the effect of elevator maintenance and management.

3.2 Strong reliability

By applying the Internet of Things technology to elevator maintenance management, the reliability of maintenance work can be greatly improved, and a higher level of information and data exchange can be achieved, so that managers can carry out intelligent management of elevator data, and greatly improve the reliability and security of elevator operation. It can be seen from this that the application of big data technology and Internet of Things technology to elevator maintenance management can greatly improve the reliability of elevator operation.

3.3 High security

Through various technical means, the means and methods for maintenance managers to obtain elevator data are also increasingly rich, which will greatly improve their work efficiency in carrying out daily supervision and management of elevators, and improve the comprehensive level of elevator maintenance. Moreover, the application of Internet of Things technology to elevator maintenance management can further improve the level of elevator information construction, enhance the emergency capacity of elevator maintenance management personnel, and improve elevator safety. In case of elevator failure, through the introduction of Internet of Things technology, managers can understand the fault location of elevator operation from the system client, which can greatly improve the efficiency of fault resolution and enhance the safety of elevator operation.

4. Optimization measures of Internet of Things technology in elevator maintenance management

During the installation of elevator maintenance management system, the most important is electrical engineering, which includes high-voltage substation system, backup power supply system, emergency exit indication power supply system and lighting power supply system. Before carrying out the corresponding installation work, the construction team shall make corresponding preparations. When the Internet of Things technology is applied to the elevator maintenance management system, the installation technology involves a wide range, which puts forward higher requirements for the corresponding installation personnel.

Generally speaking, the installation of elevator equipment based on the Internet of Things technology not only involves pipeline engineering, environmental protection engineering and fire protection engineering, but also is closely related to electronic and electrical engineering, building intelligent engineering and mechanical equipment engineering. It can be seen from this that the application of Internet of Things technology to elevator maintenance management installation has a large industry span and involves many problems, which requires the corresponding installation personnel to have a high level of comprehensive ability and professional quality. As there are many installation projects involved, the overall comprehensiveness is strong, so there will be some technical problems in the elevator installation process. In order to avoid these problems, when we carry out the elevator installation work, we should introduce the corresponding advanced technology as support as far as possible, so as to better complete the corresponding installation work and improve the control of the elevator electrical system.

For example, when carrying out the installation of elevator electromechanical equipment, the application of BIM technology to the actual work has an important role in promoting the installation efficiency and quality. With the help of BIM technology, the efficiency of elevator electromechanical installation will be greatly improved. In addition, combined with the 3D imaging function of BIM, we can better monitor the operation of the corresponding electrical equipment in the elevator.

In electrical engineering installation, the most important is the installation of power distribution equipment, whose installation quality will have a very direct impact on the final use effect. Therefore, we must fully understand the basic function and structure of the distribution box, master the corresponding installation process, select the appropriate type of distribution box, and ensure that the corresponding electrical equipment meets the industry standards and specifications when carrying out the electrical engineering installation of the elevator. In addition, during installation, we should ensure the stability of the distribution box and keep a safe distance between the distribution box and the ground, so that it can work better.

If we want the electrical equipment installed in the elevator electromechanical system to operate for a long time and stably, we must control it at the source and do a good job in quality inspection from the procurement link. Before purchasing, we should do a good job in market research, try our best to select the products with good quality and high reputation, and also do field research in the manufacturer, combining with the corresponding inspection standards and procedures to ensure that the products meet the standard. When the equipment enters the site, corresponding maintenance shall be done to avoid equipment damage.

5. Application of Internet of Things Technology in Elevator Management

5.1 Strengthening management

The application of Internet of Things technology to the elevators in the community can help the community property better manage the flow of personnel. When the elevator has problems, the property can learn the actual situation at the first time, which is of great significance to improving the property service level. In addition, the introduction of Internet of Things technology in elevators can help the corresponding maintenance management personnel better understand the elevator operation status, supervise the elevator maintenance and repair, and record various elevator data, which plays an important role in improving the safety of users when using elevators. In combination with the actual situation of the community, we can create a big data platform. In addition to the property of the community, we can view various elevator data, and the government departments can also supervise the elevator operation, so as to achieve data sharing. In addition, by sharing elevator data to the owner group, WeChat official account and other platforms, the business can better understand the actual use and maintenance of elevators, so as to create a more transparent elevator maintenance management data platform and improve the management quality.

5.2 Improve maintenance efficiency

Before the application of Internet of Things technology to elevator maintenance management, various problems often occur in elevator maintenance management, and some problems still exist after maintenance. The introduction of the Internet of Things technology can greatly improve the efficiency of elevator maintenance and repair. When problems occur, the corresponding maintenance management personnel can quickly complete the problem location and obtain the corresponding fault information as soon as possible. This can not only reduce the labor cost, but also effectively avoid excessive waste of maintenance costs. If there are technical problems in elevator maintenance management, maintenance personnel can search for solutions based on the Internet, which is of great significance to improve maintenance efficiency.

5.3 Correctly solve the problem of elevator maintenance

In order to ensure the normal operation of the elevator, the technical supervision and management department should set some regulations to ensure the normal use of the elevator. In the actual inspection process, the corresponding maintenance company should accurately implement this system. After a fault occurs, a clear system can greatly improve the efficiency of problem solving and avoid unclear division of responsibilities. In the elevator maintenance management, the main reasons for the problems are as follows: First, the elevator maintenance personnel are not serious about their work attitude, and they do not carry out corresponding operations according to the corresponding maintenance manual in actual work, which easily leads to frequent elevator problems. Secondly, elevators are widely distributed. Due to the wide distribution of elevators, it is difficult for the maintenance management department to carry out timely inspection and maintenance on each elevator, which will also cause the elevator to have a guardian problem. Its three-dimensional maintenance market is expanding, but there is a lack of a unified elevator maintenance standard among companies, and the corresponding maintenance records are not perfect, which will affect the quality of elevator operation. Therefore, we should reasonably introduce the Internet of Things technology, correctly solve various problems in elevator maintenance, and improve the quality of elevator maintenance management.

6. Conclusion

To sum up, if we want to improve the application effect of Internet of Things technology in elevator maintenance management, we can analyze it from the aspects of strengthening management, improving maintenance efficiency, and correctly solving elevator maintenance problems, so as to virtually promote the elevator maintenance management level to a new height, and ensure the smooth, stable and safe operation of elevators based on Internet of Things technology.

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