

Innovative Research on Fire Safety Management Mechanism in Colleges and Universities Based on Big Data

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Abstract: Fire control safety is an important guarantee for university safety. Safety work is the foundation of the existence and development of colleges and universities. The building structure function of colleges and universities is complex, and the personnel is dense. So, once a fire breaks out in colleges and universities, it will do great harm. Although colleges and universities have equipped fire alarm systems in teaching buildings, dormitory buildings, laboratories and other buildings, various reasons often delay the best time to put out the fire, such as independent fire protection system and low automation. So, the innovation research on fire safety management mechanism in colleges and universities has important practical significance for the prevention and control fire. This paper first clarifies the importance of big data in fire safety work, and then analyses the current situation of fire safety management mechanism in colleges and universities. Finally, combined with the actual situation, this paper constructs a university fire safety management mechanism based on big data.

1. Introduction

At present, colleges and universities have established a relatively complete and sound fire safety system. First, we have relatively advanced fire fighting equipment and equipment. Second, we have established fast and accurate communication channels for fire fighting. Third, the fire officers and soldiers are well trained. If a fire breaks out, they are able to call the police quickly. However, there are still some problems in the actual fire fighting, such as protective facilities layout, fire channel selection, fire rescue coordination, etc. Big data is characterized by large quantity, multiple categories, fast processing speed and high accuracy. It combines with cloud computing, Hadoop technology and parallel database to create an information system for fire fighting system. In the era of big data, all kinds of information may become the key data of fire fighting. Big data can integrate seemingly unrelated data to provide correct guidance for fire protection system construction. When a fire occurs, it can respond in time, guide correctly and put out the fire quickly. At the same time, it can monitor urban fire prone areas in real time and take fire prevention measures in an all-round way.

2. The problem of fire safety management mechanism in colleges and universities

2.1 Independent fire control system with irregular management

The fire control system is constantly increasing, with independent existence and irregular management. At present, China's colleges and universities have set up fire control system, including fire smoke, temperature alarm control system. Independent fire control systems will be added as high fire rating buildings are built. The fire safety of most colleges and universities is professionally maintained by social professional fire protection companies. However, many fire control systems are aging, which can not play a normal fire warning function. Moreover, the fire control center room has no professional staff on duty, and there are many loopholes in management.

2.2 Fire water system monitoring and pump cannot be controlled remotely

There are many things that need constant attention and inspection in every college floors, such as water spraying, water pressure of fire hydrant network, water level of fire pool, whether there is fault of fire pump, etc. However, in actual work, it is difficult to ensure the normal operation and timely detection of problems. Once the school fire, fire water can not be guaranteed will become the key issue of prevention and security. So, how to integrate the fire water system into the command platform for real-time monitoring has become an urgent problem.

2.3 Human safety assessment cannot meet the requirements

The management of fire control facilities in colleges and universities mainly relies on people's on-site inspection and disposal, such as gas fire extinguishing system, building smoke prevention and exhaust system, emergency lighting system, fire power supply system, fire extinguisher, etc. Traditional manual inspection has been difficult to meet the requirements of fire protection work.

3. The construction of fire safety management mechanism based on big data

3.1 Fire safety management mechanism construction scheme

At present, the university fire control system construction has basically realized the information system of fire control, such as fire fighting and rescue information system, fire control supervision information system, fire control force management system, public service information system, fire statistics and analysis system. With the application of cloud computing and big data, it is imperative for firefighting work to promote the standardization, structuring and perfection of firefighting system with big data. In this paper, the fire integrated big data platform is built, including early warning management system, visual management system, remote monitoring system, safety supervision and management. It realizes real-time disaster information, comprehensive monitoring objects and fire data sharing. The fire safety management mechanism construction scheme is shown as the figure 1.

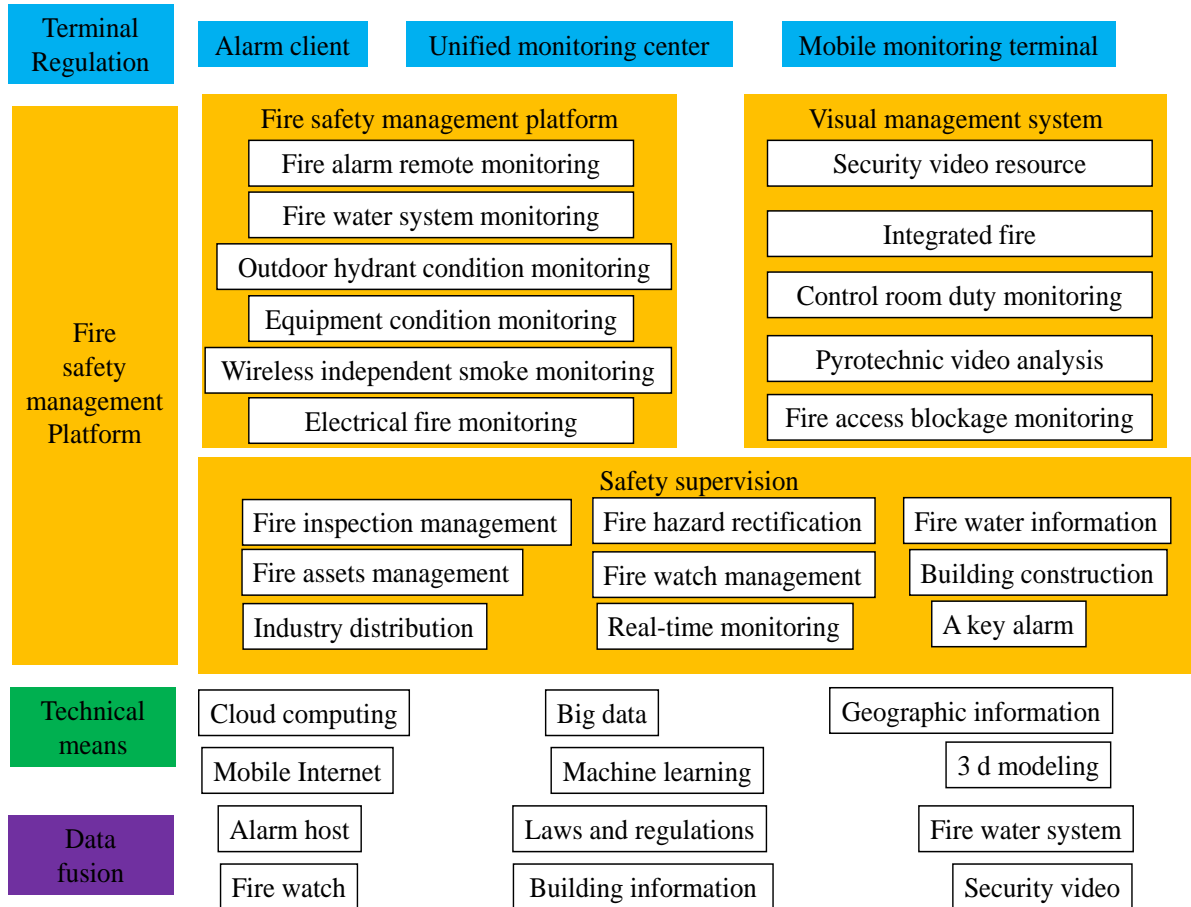


Figure 1: The fire safety management mechanism construction scheme

3.2 Fire water early warning management system

The fire water monitoring system automatically monitors the building fire water system information in real time, such as water spraying, water pressure of fire hydrant network, water level of fire pool, whether there is fault of fire pump, etc. It realizes the active management of the elimination and waterproofing system. The system can quickly find the system abnormality and fault by calling video, intelligent alarm, data information and other ways. It can effectively reduce the number of on-site inspection, improve work efficiency.

3.3 Fire visual management system

Through transmission to the monitoring center, the fire visual system realizes the centralized control of extinguishing control and alarming. At the same time, it can realize the integration with monitoring. Alarm can be linked to the map, plan, video, so that the relevant personnel can first time scheduling information. System management of all buildings, fire facilities and equipment, fire patrol supervision, fire management information. The system connects the campus, buildings and fire fighting facilities and equipment, and carries out visual view, monitoring and analysis. The system carries out video monitoring for the on-duty personnel in the control room of key units and records the on-duty situation.

3.4 One map system

Through a GIS map, the elements of fire control supervision are displayed and supervised with "one map". This can realize real-time disaster information and visualization of supervision objects. "One picture" can integrate basic information of fire fighting and emergency rescue, randomly review and query, and evaluate the whole operation process. Which can ensure quick response, scientific decision-making and efficient disposal of the command. The One map system is shown as the figure 2.

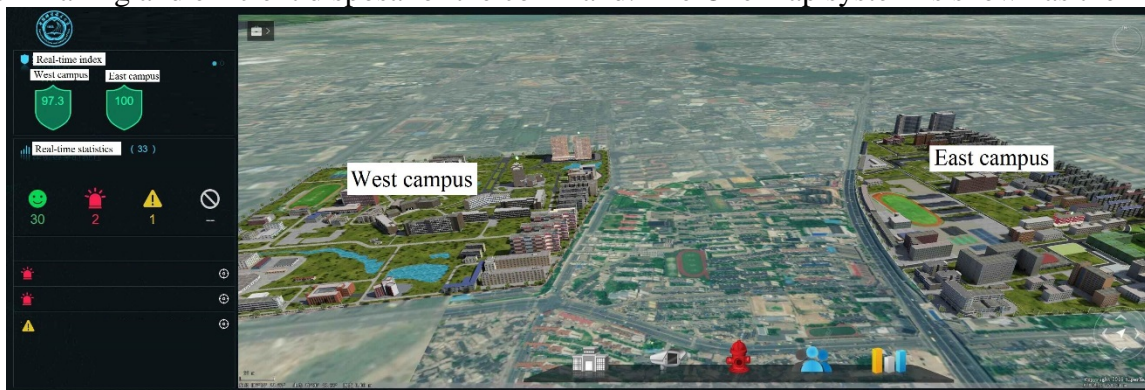


Figure 2: The One map system

4. Conclusions

Through the innovative research on the fire safety management mechanism in colleges and universities, all fire control systems are effectively controlled and fire safety inspection is networked. With the implementation of fire control safety in colleges and universities, a centralized command platform with monitoring, public security and fire control functions can be established. When the school emergencies, Fire Safety Management Mechanism can facilitate emergency command and ensure the safety and stability of the campus.

References

- [1] Chen bin. China excellent master's degree database [J]. South China university of technology safety engineering 2015.
- [2] Jiangsu provincial people's government. Jiangsu province iot industry development planning outline [Z].2010.
- [3] Wang wei, nan jianglin. Application of Internet of things technology in social fire safety management. Fire science and technology, 2012.
- [4] Yang zhen. Internet of things and its technological development [J]. Journal of nanjing university of posts and telecommunications (natural science edition), 2010.