Application of Information Technology in Construction Machinery Management

Yizhou He
Chongqing Real Estate College     P.C.400021

Abstract: Construction machinery is a key factor in the construction of construction projects, which is of great significance for ensuring the quality and schedule of construction projects. Many problems have arisen in the current management of construction equipment, which have a negative impact on the reliability and sustainability of construction equipment. Emphasizing the quality of construction equipment management work and optimizing the application of information technology in construction machinery management can effectively improve the continuity of machinery equipment operation. This article will systematically discuss the application research ideas of information technology in the management of construction machinery, and put forward related suggestions based on the actual situation.

1. Introduction
Mechanical equipment provides the most basic tools for construction engineering construction, and plays an important value in the construction of the entire construction project. With the development of urbanization, the number and scale of construction projects are constantly increasing, and the use of construction machinery and equipment is also more extensive. It cannot be ignored that the traditional management model can no longer meet the needs of construction machinery management. In the context of the information age, the introduction of informatization management mode can not only improve the effectiveness of mechanical equipment management and construction project construction efficiency, but also greatly save construction costs and promote the good development of construction engineering. However, there are still many problems in the management of machinery and equipment. The main problems are that the construction machinery and equipment management system needs to be improved, the machinery and equipment control chain is broken, and the machinery and equipment management mechanism needs to be improved. This article will briefly discuss these three issues in order to analyze how to promote the construction of construction machinery management information.

2. Application of Construction Machinery and Equipment

2.1 Construction Machinery Equipment Management System Needs to Be Improved
Most of the emphasis of construction project construction is on the construction process. Therefore, many construction companies have not formulated a complete mechanical equipment management system, which has led to the following hidden dangers in the use and management of mechanical equipment. ①Most construction machinery and equipment are placed in the open air at the construction site, which is easily affected by the negative influence of external factors.②Some users of machinery and equipment do not have professional technical training, and it is easy to appear the problem of improper operation of machinery and equipment.③Some construction machinery and equipment use records are blank, and the corresponding equipment use registration management
process has not been followed at all. The overhaul and maintenance of construction machinery and equipment were not implemented in place, which exacerbated the aging degree of mechanical equipment and could not guarantee the safety of construction equipment [1].

2.2 Mechanical Equipment Control Chain Fault
Mechanical equipment accounts for a relatively large part of the construction project budget, and the cost control of the project requires corresponding management specifications as support. Construction machinery is expensive, but the actual cost management system has obvious loopholes. The performance guarantee of construction machinery and equipment requires enterprises to establish a special system to introduce, store, use, and maintain machinery and equipment to form a complete management plan. Strict number registration for machinery and equipment, and tracking management for different equipment. Actively introduce a waste treatment system to establish archives for all machinery and equipment to effectively control the wear rate of machinery and equipment and prepare for the implementation of cost control [2].

2.3 Mechanical Equipment Management Mechanism Needs to Be Improved
Construction companies emphasize construction quality blindly, but the management of machinery and equipment is full of loopholes. Managers lack professional technical knowledge. Construction companies should establish specialized equipment management departments to give full play to the advantages of computer technology in the management of mechanical equipment. At present, construction workers are not optimistic about the operation skills of various mechanical equipment, and the personnel on the construction site are relatively complicated. The basic machinery and equipment still work without a license, which poses a threat to the lives and safety of on-site personnel. Secondly, there are also many problems in the control of machinery and equipment, procurement and quality inspection. Construction organizations often ignore the safety of equipment quality management. Therefore, it is easy to appear inferior. In addition, accidents in the safe operation of machinery and equipment frequently occur, which seriously affects the safety and quality of construction projects [3].

3. Research on Application of Information Technology in Construction Machinery Management

3.1 Construction of Machinery Equipment Information Management Platform
To improve the application scheme of informatization in the management of construction machinery and equipment, first of all, it is necessary to make full use of information technology to build a machinery and equipment information management platform and build a machinery and equipment information management framework. From the perspective of the overall structure, the mechanical equipment information management framework is mainly composed of data entry, remote monitoring equipment, video monitoring, database, automated supervision and inspection, report generation, mobile terminal and remote control system. In the implementation of the basic data management of machinery and equipment informatization, it is necessary to do a good job of classification of six sets of data: First, the basic data of human resources, this set of data mainly includes information and qualification certificates of equipment operators and management personnel. Second, the basic data of cooperative enterprises, this set of data is mainly composed of basic information of construction enterprises, supplier qualifications and basic information of supervision enterprises. Third, the basic data of fixed assets. The fixed assets here are mainly machinery and equipment. The data content includes the names, categories, numbers, specifications, manufacturers, useful lives and asset depreciation rates of machinery and equipment. Fourth, the basic data of monitoring equipment, this set of data includes remote monitoring equipment model, alarm mode, control switch, hidden danger type and sensor model. Fifth, management basic data. This set of data includes construction machinery equipment purchase management information, equipment use information, logistics management information, machinery equipment assembly information, and machinery equipment maintenance
information. Sixth, warehousing data. This group of data mainly refers to the storage information of mechanical equipment and parts in the warehouse, including quality information and quantity information.

Second, construction enterprises should formulate effective maintenance management in accordance with the structural characteristics of machinery and equipment, and clarify the job responsibilities of machinery and equipment management personnel. According to the relevant manuals formulated for the management of construction machinery and equipment, the inspection system for machinery and equipment is optimized, and the maintenance and repair of machinery and equipment are carried out at regular intervals. If problems are found, they need to be handled and reported in time. Construction enterprises should gradually strengthen the management efficiency of construction equipment and work out a sound construction equipment management system. At the same time, we must ensure that the management of construction machinery can be put in place, and the scientificity and rationality of management of machinery and equipment are guaranteed. In the case of machinery and equipment that are rotated by multiple people, the management authority and responsibility should be divided in a timely manner. Reduce the probability of damage to machinery and equipment, and ensure the smooth progress of construction projects. Based on the actual situation, a reasonable transfer system is formulated to provide theoretical support for the clear division of power and responsibility. Third, we must use the information management platform to do a good job in the rational deployment of construction machinery and equipment. It should be noted that different construction machinery and equipment are different in many aspects such as mechanism and performance. Corresponding construction machinery and equipment must formulate scientific operating specifications and technical requirements, and staff must strictly maintain and manage equipment in accordance with relevant regulations to further improve the production efficiency of machinery and equipment. In addition, the staff should analyze the actual needs of construction project management, use internal leasing for the machinery equipment of the enterprise, and fully mobilize the work enthusiasm of the construction machinery and equipment management department. It should be noted that the construction project has long-term and regional construction characteristics, so the management of construction machinery and equipment should be flexibly changed. At the same time, it is necessary to strictly follow the relevant standards for the maintenance and management of machinery and equipment, and to timely eliminate and dispose of equipment that has exceeded its useful life [4].

3.2 Realize Information Management of Machinery and Equipment Procurement

In the process of purchasing construction machinery and equipment, procurement personnel should pay attention to purchase from qualified suppliers in accordance with standards and strive to implement information management of machinery and equipment procurement. When signing a purchase contract, the quality inspection (assembly), acceptance and maintenance points of the purchased equipment must be clearly marked. After receiving the machinery and equipment, the management personnel of the quality inspection agency must carefully carry out the equipment inspection in turn with reference to the manifest, and use the information automatic testing equipment to carefully check all equipment names, quantities, models and the amount spent. If there are no problems with the inspection results, you need to open the packing box for a comprehensive inspection. At the same time, you must carefully check the packing list with the help of information technology to ensure that it is accurate before signing. If a problem is found, the equipment manager needs to contact the supplier immediately to exchange or return the product, and validly accept the re-exchanged equipment. The technical staff of the procurement department should develop equipment purchase acceptance management plans in accordance with the technical conditions and standards required by this institution. For important machinery and equipment with large size and precise internal structure that are not easy to operate, there must be suppliers and mechanical equipment users to check the perform acceptance at the same time.
3.3 Strengthen Talent Training
Analyzing from the overall structure, the training content of construction machinery and equipment information management can be subdivided into two parts: professional skills training and safety education training [5]. At the same time, construction enterprises should have targeted training and education for construction equipment managers, technical operators and construction personnel, and formulate scientific construction plans. Attach importance to the assessment work, compile safety manuals and safety production knowledge manuals, and distribute them to all construction personnel. Prior to the operation of machinery and equipment, personnel must be provided with a three-level education. Those without qualifications cannot operate the equipment, and safety management training for construction machinery and equipment managers must be done. In addition, in specific training work, construction enterprises should formulate different training courses according to different professional personnel, and comprehensively use job rotation, classroom training, remote training and other methods to provide on-the-job training for mechanical equipment managers, operators and construction technicians. Among them, on-the-job training is usually provided by a senior employee or manager, who will operate the trained employees under their guidance. Job rotation is a form of on-the-job training, also known as cross-training. In job rotation, employees learn several different jobs in a work unit or department, and do each job once in a specific period of time. The biggest advantage of job rotation is to make the work within the department more flexible. Classroom training is conducted off the job and is the most familiar training method for employees. Classroom coaching is used more frequently by technical, professional, and management personnel. Remote training specifically refers to remote virtual classroom training. The so-called virtual classroom is an online teaching and learning environment. It integrates chat rooms, desktop computer video conferences, websites and email distribution into a typical lecture-based system. This training method is more flexible, effective and highly interactive.

3.4 Introducing Multiple Advanced Technologies
To improve the application effect of informatization in construction machinery management, a variety of advanced technologies must be fully introduced to make the construction machinery informatization management model more complete. From a macro level, construction enterprises should make full use of integrated technology, intelligent technology, numerical control technology, virtual technology, and flexible automation technology. Among them, integrated technology can achieve high integration of mechanical equipment management. In practical applications, work personnel should carefully check the functional indicators of the construction machinery and equipment, carefully calculate the relevant parameters, and make a record of the original data, so as to provide accurate reference information for the safe operation and management of the machinery and equipment. Secondly, during the operation of the machine, attention should be paid to controlling the details, giving full play to the advantages of integrated technology, and maintaining and processing all parts. Besides, a comprehensive mathematical model should be constructed with the help of integrated technology in order to improve the information management scheme of mechanical equipment. Intelligent technology is the product of the network age. The application of intelligent technology in mechanical design can comprehensively improve the automation level of the machinery production industry. Analyzing from the overall structure, the application mode of intelligent technology in mechanical design is mainly reflected in three aspects—mechanical intelligent design, artificial intelligence application and mechanical system intelligent technology application. In addition, intelligent technology is a comprehensive technology that combines multiple technical advantages. Numerical control technology is mainly used in the maintenance and management of precision machinery, especially mechanical parts. In addition, CNC technology can use computer software to automatically control small parts inside mechanical equipment, and edit computer programs in advance to provide accurate control instructions for the automatic operation of mechanical equipment, thereby effectively avoiding errors caused by manual operations. Virtual technology is an organic fusion of artificial intelligence, electronic information technology, simulation technology, simulation technology and
multimedia technology. To use this technology to improve the effect of information management of mechanical equipment, it is necessary to accurately simulate the incurable diseases of mechanical equipment during operation. Then, take advantage of simulation technology to solve it, so as to ensure the safe operation of mechanical equipment. Flexible automation technology is an organic system integrating digital control technology, information control technology and material storage and transportation technology. This technology is based on flexible management and can match the most suitable operation mode for different mechanical equipment operation. The use of flexible automation technology to carry out informatization management of construction machinery and equipment must fully improve the management information system of machinery and equipment with the help of man-machine operating interfaces, so as to further improve the quality and efficiency of machinery and equipment management.

4. Conclusion
To sum up, improve the application effect of information technology in the management of construction machinery and ensure the safety and quality of mechanical equipment. At the same time, construction enterprises should pay attention to fully introducing various advanced technologies, building machinery equipment information management platforms, building machinery equipment information management frameworks, in order to achieve machinery equipment procurement management informationization and strengthen personnel training.

References:
[1] Liu Ying. Analysis on strategic methods of construction equipment management [J]. China Petroleum and Petrochemical Standards and Quality, 2018 (02).
[2] Lou Jifeng, Zhang Di. Talking about the whole process management of B supply materials for water conservancy and hydropower projects [J]. Science and Technology Horizon, 2017 (18): 156-157.
[3] Wang Hongchuan. Construction of construction engineering electrical equipment installation project progress management system [J]. Shanxi Architecture, 2010 (18): 211-212.
[4] Zhang Zhibin, Li Shilin. Crane safety management system based on Internet of Things technology [J]. Lifting and Transportation Machinery, 2012 (5): 79-81.
[5] Gu Fengying, Zheng Qinghua. Probe into the problems that should be noticed in the detection of building energy-saving materials [J]. Science & Technology Innovation and Application, 2015, 20 (05): 171.