Research on the Convergence Value of Intelligent Construction Site Promoted by Information Construction

Yue Yue ¹, a, Jiaye Wu², b, Shuyang Liu³, c

¹School of management, Sichuan University of Science and Engineering, Zigong 64300, China.

²School of civil engineering, Sichuan University of Science and Engineering, Zigong 64300, China.

³School of management, Sichuan University of Science and Engineering, Zigong 64300, China.

a616181649@qq.com, bwu@centralit.com, c931074431@qq.com

Abstract: With the advancement of society and the improvement of people's living standards, urbanization has accelerated throughout the country, and construction projects have sprung up. The rapid development of information technology has brought about earth-shaking changes and many conveniences for people's lives and work. How to use information technology to monitor the construction process in real time, so that the construction of the site can achieve a qualitative leap. Built on the in-depth study of informatization construction, this paper determines the overall framework and basic functional modules of the intelligent site monitoring system software. Through the intelligent site monitoring system, not only the site construction, induction equipment management, project law enforcement management and monitoring system management can be carried out for the engineering construction project, but also the noise and dust data of the construction site boundary can be collected, and the construction site of the data overrun can be processed. The implementation of the system makes the noise and dust pollution in the construction process go to the judicious management road of timely feedback and rapid adjustment.

Keywords: Information construction, smart site, integrated value, site management.
1. Introduction

1.1 Information Construction

In February 2017, the "Opinions on Promoting the Sustainable and Healthy Development of the Construction Industry" issued by the General Office of the State Council clearly stated that "promoting the modernization of the construction industry", "promoting smart and fabricated buildings", "strengthening the application of technology research and development", and promoting the construction industry with technological means. Progress is the general trend. With the continuous development of information technology and the deepening of the exploration of information construction in the construction industry, the construction of information technology has become increasingly applicable to the application of specific engineering projects. For the last "one kilometer" of the construction field, that is, the construction site, through the deep integration of advanced information technology and construction technology such as cloud computing, big data, Internet of Things, mobile Internet, artificial intelligence, BIM, etc. Ways to promote the success of engineering projects are of great significance.

Informatization construction not only uses computer technology and the Internet to manage engineering projects, but also makes a wide range of connotations and extensions.

(1) Make full use of the conditions provided by computers and the Internet, collect, process, transmit and share various information, reduce the workload of various departments, and provide a strong guarantee for engineering construction and project decision-making;

(2) The information construction system can promptly feedback relevant information, which can make the plans become more advanced and reasonable, more adapt to and serve the construction, make the project construction activities more standardized and scientific, and can fully improve the project construction. Management automation level;

(3) Enable the managers of each project to work collaboratively on the same platform. The design of construction engineering construction system hopes to improve the quality of construction through the control of cost, quality, schedule, safety and other aspects, as well as the management of contracts, payment, settlement, funds and other factors.

Construction has the characteristics of comprehensive coverage, strong constraints, huge workload, and very large information flow. Implementing information management for building construction can save time, effort and high social and economic benefits at a lower cost. Using computer technology and the Internet, the information management of construction projects is carried out, so that the
management personnel of each project can work collaboratively on the same platform, which can maximize work efficiency and economic benefits of the project. The informationization development of the construction industry is gradually keeping pace with the time. The application of science and technology will change with each passing day, and the wisdom of the construction site is an inevitable trend in the development of the industry. Under the new normal, construction companies are increasingly focusing on the project construction site, combining advanced information technology and management concepts with on-site realities. With the development of information technology and the introduction of the "Internet +" strategy, smart sites have emerged as the times require. It integrates information technology such as cloud computing, big data and BIM with advanced construction technologies, and conforms to the development needs of the time and society. Innovative changes in the construction industry.

1.2 Wisdom Site

The start site is a smart earth concept in the engineering field, and it is a brand-new engineering life cycle management concept. Wisdom site refers to the use of informatization means to accurately design and construct the project through the three-dimensional design platform, build the information technology ecosystem of the construction project with interconnection, intelligent production and scientific management around the construction process management, and put this data in In the virtual reality environment, the engineering information collected by the Internet of Things is used for data mining and analysis, providing process trend prediction and expert plans, and realizing intelligent management of engineering construction to improve the level of engineering management information, thereby gradually realizing green construction and ecological construction [1].

The smart site will implant more high-tech technologies such as artificial intelligence, sensing technology and virtual reality into various objects such as construction machinery, personnel wear facilities, and entry and exit points, and be universally interconnected to form an “Internet of things”. The “Internet” is integrated to realize the integration of engineering management stakeholders and engineering construction sites. The core of the nifty site is to improve the interaction between the various organizations and positions of the project in order to improve the interaction. Clarity, efficiency, flexibility and responsiveness. ”

Wisdom site gets a new information-based means based on high-information, which supports the comprehensive perception of people and things, comprehensive and intelligent construction technology, interoperability of work, information sharing, scientific analysis of decision-making, and pre-control of risk wisdom. Key elements
such as machine, material, method and ring can greatly improve project quality, construction safety, save cost, improve decision-making ability and management efficiency on the construction site, and realize digitization, refinement and wisdom of the construction site.

2. Informatization construction to promote smart site is the trend of the time

2.1 Characteristics of the smart site

"Smart Site" is the result of deep integration of information technology and advanced construction technology such as the Internet of Things. It has the following four characteristics: (1) Focusing on the first-line production activities at the construction site to realize the deep integration of information technology and the production process. Implementation of traditional enterprise informationization focuses on the management process. Forms, processes, and statistical analysis are the primary application methods. Forming a report-based informationization model often results in data distortion, delay, and inconsistency, and cannot really improve the on-site supervision capability. In order to achieve more efficient resource elements on the site, and better monitoring of quality, schedule and cost, it is necessary to break through the traditional information application mode and apply information technology to the front-line work to truly solve the business problems on the spot. For example, in the management of labor services, new technologies such as card, face recognition, infrared or smart helmets are applied to the business activities such as attendance, entry and exit, and safety education of labor management to realize transparent, safe and real-time management of on-site labor workers. This is the purpose and core feature of the "smart city" application.

(2) Ensure real-time data acquisition and sharing, and improve on-site data-based collaborative work capabilities. This includes two meanings. First, in the field of data collection, it is necessary to make full use of IoT technology such as image recognition, location tracking, etc., to obtain real-time access to people, things, and other management data, and to achieve multi-party sharing through the cloud to ensure the accuracy and timeliness of information; Second, in the aspect of information sharing, according to the logic of project site business management, open up the intercommunication of data, and form data interaction between horizontal business and vertical management level to avoid information. Isolated islands and data dead ends, and through the use of mobile terminals and other technical means, taken into account these data to achieve collaborative work, speeding up the resolution of problems and the efficiency of processing problems.

(3) Strengthen data analysis and forecasting support to assist leaders in making
scientific decisions and intelligent predictions. “Smart Site” should establish data collection, sorting, analysis and display mechanism, and analyze the data correlation of a large amount of engineering data collected at the site to form a knowledge base, which can be used to analyze, calculate, compare, judge and associate information. Decision-making, provide management process trend forecasting and expert plan, provide scientific decision support for each management level in a timely manner, and timely provide early warning and response to the management process through intelligent predictive ability, and realize site smart management.

(4) Fully apply and integrate software and hardware technologies to meet the changing needs and environment of the construction site, and ensure the effectiveness and feasibility of the information system. “Smart Sites” need to integrate new information technologies to improve the way in which the various organizations and positions of the project interact with each other in a “smarter” approach to improve the clarity, efficiency, flexibility and responsiveness of the interaction. The key points of information technology application include: (1) It is necessary to use the Internet of Things technology to implant sensors into various objects such as buildings, machinery, personnel wear facilities, venue access gates, etc., and to be universally interconnected to form the Internet of Things, and then integrated with the Internet to achieve the interconnection of everything; (2) integrate the application of mobile technology and cloud technology, realize the integration of engineering management stakeholders and engineering construction site in the field to ensure real-time collaborative work; (3) the application of intelligent construction equipment, for example, based on GPS, digital Photogrammetry, Internet of Things and other intelligent measurement technologies to solve technical problems such as measurement speed, accuracy and deformation of steel structures such as extra large, special-shaped, large-span and super-high-rise, to achieve precision, quality and safety of steel structure installation. Effective control of construction progress; (4) application integration platforms, both the enterprise and the project department have the need for unified management and monitoring of the site. At the same time, a large amount of data needs to be uniformly aggregated and analyzed. Therefore, it is a need for an integrated platform system on the basis of standard data interfaces that standardize different systems, to realize the "smart site" integrated supervision system, and to ensure seamless integration with the current management system and software system.

2.2 Informatization Construction promotes the application value of Smart Sites
Through the comprehensive application of advanced information technology, “Smart
Workplace” can realize real-time, comprehensive and focused supervision and management of key elements of the construction site, effectively supporting field staff, project department managers, enterprise managers and even industrial management departments. The management work has improved the control level of construction quality, cost and schedule to ensure that the success of the project. The application value, of "smart city" consists of the following aspects.

(1) Effectively increase the efficiency of construction site personnel. The application of “smart site” can effectively improve the efficiency of field personnel, which is mainly manifested in three aspects.

① Reasonably improve the rationality of construction organization planning. Through BIM technology to achieve construction organization simulation, optimize construction progress, rationally arrange the flow of water in the process, to ensure that each construction worker's workload is balanced, to avoid the occurrence of personnel restrictions or overload work and other adverse conditions affecting the overall efficiency.

② Reasonably optimize resource allocation. Work efficiency of personnel is a direct result of the rational allocation of production materials such as construction machinery and materials. Insufficient or shortage of machinery or materials may cause the work of personnel and affect the progress. The application of “smart site” can ensure the orderly management of materials, equipment and site layout, and assure the equitable deployment of mechanical equipment, materials and site layout. For example, through the two-dimensional code, intelligent identification and other technologies to automatically count the amount of materials on site, to ensure that the building materials are reorganized adequately, and through the mobile collaborative platform, in time before the materials enter the scene, timely coordinate the contact with the construction principals to avoid excessive or too little material. The problem. Optimize site configuration through BIM site layout software to reduce ancillary handling.

③ Increases the communication efficiency of on-site personnel. Many of the delays or problems in the field are caused by the inability of relevant stakeholders to communicate and share information in a timely manner. “Smart Site” enables anytime, anywhere communication through mobile applications, mobile terminals and cloud computing. Technology and on-site situations solves problems with relevant stakeholders through the comparison of sound, pictures and video and BIM models.

(2) Effectively enhance the comprehensive management and control capabilities of the project on site production. Integrated management and control of on site production refer to the comprehensive management and control of various aspects of the project, including schedule, cost, quality, safety, personnel and environment. There are many
open-air high-altitude operations at the construction site, combined with multiple types of work, and the flow of personnel is large. It represents an area with a hidden danger. The application of “smart site” can effectively enhance the on-site management and control capabilities, making up of the resulting aspects.

①From the perspective of business data, field data is the basis for project management.
"Smart Site" comprehensively applies location technology, sensor and identification technology and other Internet of Things technologies to collect on-site data, on the one hand to ensure the accuracy, timeliness and effectiveness of the field data; on the other hand, through the integrated supervision platform, the first-line production Once the data reaches the top, it is presented in front of the management personnel in real-time, providing a reliable basis for management. At the same time, a large amount of data is accumulated and integrated into the integrated supervision platform to offer a basis for scientific decision-making through data analysis. For example, through the real-name system of labor services, the labor status of migrant workers at a certain construction site is accurately recorded, which serves as a certificate of remuneration. In addition, being dependent on the performance of enterprises and migrant workers, the establishment of a two-way blacklist system, which constitutes a credit record in the construction industry, can fundamentally solve the wage disputes between migrant workers and enterprises.

②Strengthen the management of each business segment of the project site. Establish safety supervision network through on-site video surveillance, security alarm and other technical means to ensure safe production; improve the accuracy and efficiency of quality inspection through intelligent equipment, reduce the incidence of quality and safety accidents; improve the schedule through BIM-based 4D management coordination with other supporting resource planning, construction process, a reasonable allocation of resources, the correct guidance of production activities; things by weighing, identification, and other two-dimensional code technology to strengthen the management and control of construction materials. For example, the weight of the material entering the field is accurately obtained through the weighbridge system, the phenomenon of incorrect material is eliminated, and the cost is saved. The precise management of the on-site personnel is realized through the positioning technology and the real-name system of labor, including timely attendance, location, etc., and the related security system can be used for personnel. Hazard source range alarms, etc; Through the 5D management based on BIM, the contract capital and cost in the construction process are visualized, such as the binding of partial and itemized components in 5D with contracts, subcontracting and flow, etc., so as to precisely control the material acquisition and realize the material control.[3].

(3) Support lean project management.
Lean management believes that material procurement is not timely, mechanical equipment is not in place, quality and safety accidents are at the root of on-site waste, the core of management aims to reduce waste. "Wisdom construction site" by means of on-site production management and technical ability to improve the whole process of supervision and management for each link, find or prediction problems in a timely and coordinated to solve, can significantly reduce schedule delay, quality safety accident, the problem such as poor communication coordination, eliminate the waste of each link, finally improve the efficiency of project and benefits.

(3) Industry regulation and service levels have been effectively improved "Smart site" is not only applied in enterprises, but also includes the industry's smart supervision of construction sites. Through the establishment of the government departments based on BIM technology, Internet, mobile communication technology platform for the engineering quality and safety supervision, implementation of project construction site personnel, machinery, equipment, temporary facilities and other security information real-time acquisition and summary analysis, timely find potential safety hazard, monitoring ability, improve the safety production to reduce and eliminate production safety accidents. Establish a rigorous quality traceability mechanism by using intelligent means, standardize the quality inspection and testing behavior, timely discover quality hidden danger, and ensure the traceability of data. Labor real name system management information systems, the establishment of industry labor real name system based on Internet of things, big data management platform, through the Internet of things technology, intelligent equipment real-time dynamic monitoring of labor service personnel at the scene of the engineering services to the scene of the distribution, and implementation and engineering field service personnel safety, environmental education training information, improve labor management level and the scene of the construction enterprise labor management ability. Through the real name system of labor service management platform and integrity management system docking, to achieve the sharing of labor information.

It can be said that both the internal demand of fine site management and the external driving force of the rapid development and comprehensive application of modern advanced technology indicate that the construction industry is developing towards a smart trend of more integrated and unified management, efficient and collaborative work and more automation and intelligence.

3. Informatization at home and abroad to promote the smart site process

3.1 Current situations of information construction management abroad

(1)The PMIS
From 1980 to 1996, the birth of microcomputer and the development of data
technology, the systematic emergence of project management, "PM1S" by the civil engineering international bidding project management system, the capital construction plan statistics management system, foreign financial and engineering investment management system, imported equipment and materials management system and transaction management system five systems. Through the practical application and operation test verification, the system development has fully considered the user's operational environment and the business process as well as the data flow direction, has taken into consideration the system pertinence and the applicability.

In 1990 Steele, G.D. and Matthews, I.A., pointed out that the rover group plant information system (FIS) project had demonstrated that standard, well-proven techniques could be used in a short period of time to build management information systems that would allow users to access existing data in a variety of production systems.

In 1990, Personal Digital Assistant (PDA) came into being. PDA system has incomparable advantages over other systems. It is portable, fast and convenient to calculate the data collected on the spot. Japan applies it to the field data collection of engineering, which is characterised by a single machine operation.

(2) The BIM

From 1997 to 2009, due to the development of Internet technology and mobile terminal technology (mobile phone), PMIS built on a stand-alone database into a network database. The emergence of BIM technology. The design method of 3d model + database is obviously better than that of 2d graph + text, which has become the mainstream of engineering technology.

The General Services Administration (GSA) launched the national 3d-4d-bim program in 2003 and has released a series of BIM guidelines. The United States Army Corps of Engineers (USACE), a federal agency, developed and released a 15-year (2006-2020) BIM roadmap in 2006.

(3) ICT

ICT is the prefix combination of three English words: Information Communications Technology (ICT). It gets a new concept and a new technological field formed by the fusion of information technology and communication technology.

With the continuous development of BIM technology and the development of professional software technology, a batch of professional BIM software has emerged. In 2010 and 2016, wireless sensing technology began to enter into the engineering industry, and some sensing technologies such as video monitoring, access control, temperature and humidity entered the industry. Road mining based on satellite positioning technology, PLC technology intelligent tensioning, structural health monitoring integrated sensor network and other technologies have been tested and
applied in the industry.

(4) I - construction

In 2017, Japan took the lead in proposing i-construction, which integrates the first three stages of in-depth development and carries out integrated innovation and application. The goal is to multiply the efficiency of the civil engineering industry as it does in mechanical manufacturing industry.

3.2 Solutions of several major domestic developers:

(1) Gongyou time technology co. LTD

It is the leading intelligent site system integration overall solution provider integrating human, machine, material, law and environment. Since 2014, it has gradually built a customer-oriented marketing service network centering on Beijing and covering 294 prefecture-level cities in China. Independently developed "intelligent site unified management system integration platform i-site" to provide one-stop, whole-process cloud platform service for construction group and government authorities [4].

![Fig. 1 i-specific framework of the intelligent site unified management system integration platform](image)

(2) China uniform smart site

In 2015, China uniform will further focus on migrant workers on the basis of focusing on the government and construction enterprises and promoting industrial applications, providing free WIFI access, mobile attendance, personnel positioning and other services for migrant workers. We will use our rich transmission resources and cloud platform resources to integrate high-quality resources in the industry, and provide a package of site informatization solutions for government regulatory authorities, construction enterprises and construction workers.
Fig. 2 flow framework of China unicom's smart site

4. Current difficulties in promoting smart site

1. Driven by government regulation
   The advantage of the government's promotion is the swift progress in image. After nearly five years of promotions, it is found that the super-large projects and construction enterprises will have a guaranteed response. Other types of projects and large and medium-sized construction enterprises lack the motivation for development, and they urgently need smart site solutions to actually improve the efficiency of project management.

2. Internet of things monitoring
   The current intelligent site system on the surface of information is all-inclusive. In fact, it is highly unprofessional. Engineering management has always been and large project management group and complex process, the project management informatization (PMIS) and design work informatization (BIM) will take precedence over Internet monitoring, intervention project in sensor network way, so the Internet of things is a synonym for wisdom site, a presumptuous guest usurps the host's role, industrial 4.0 development of domestic manufacturing industry ERP is based on the project and on the foundation of 3 d CAE development. Secondly, monitoring and internet of things application are two levels of technology, monitoring itself cannot significantly reduce the process cost. For the engineering industry, the aging of personnel, reduced degree of personnel specialization and other problems of limited help.

3. Overall cost performance
   Modern intelligent technology is built on the technology supply chain. At present, the
underlying technology of each manufacturer is repeatedly constructed. Each company independently builds low-level background system and develops various software and hardware. It hopes to unify the market with the help of the government. On the contrary, large projects, large enterprises blindly "from the store" to create a smart site system, a great waste.

5. Smart site information construction system design

5.1 Strategic advantages
(1) The first-line traffic Internet of things, bridge and building health monitoring, intelligent prestress, support monitoring, construction monitoring, supervision project management, construction project management, engineering enterprise management, BIM and other latest technologies that have been constantly developed and applied in the research and application of information technology in the transportation industry have been constantly developed and applied in various projects. At present, located in hangzhou, zhejiang province, the project radiates domestic and foreign projects.
(2) Tower crane safety monitoring system
Tower crane safety monitoring system makes up of four modules: engineering management, equipment management, real-time monitoring and system management. Through the "black box" mounted on the tower crane, the system records relevant parameters and data, and implements dynamic and remote monitoring of the whole process of tower crane operation. When any violation takes place during the operation of the tower crane, the system can be automatically distinguish and immediately send an alarm signal to remind the tower crane driver to stop the violation. Ensure timely supervision of the tower crane using process from the technical means, guard against and dangerous factors and safety risks in the equipment operation process, and effectively prevent and reduce the occurrence of production safety accidents. Crane safety monitoring system, the crane machinery field control, prevention alarm and remote monitoring management platform seamless integration, the platform can timely understand the situation, take appropriate measures, so as to eliminate the potential accident in the bud, reduce the probability of safety accidents.
(3) Activate the extensive data assets of cloud platform at the construction site and carry out extensive data analysis. With the improvement of the infrastructure layer at the smart construction site and the enhancement of the perception ability at the site perception layer, the business application and process management data of the field management level are greatly enriched, and the multi-source big data assets of the cloud platform at the construction site will accelerate to form. How to use big data technology to excavate the treasure of big data and serve the on-site management of the project will be a continuous and long-term task for the construction of smart site
[5,6], and also a necessary means for the smart site to reflect the "wisdom" attribute.

5.2 Technical advantages

(1) Professional database and professional process library

The "Internet of things + big data" platform based on multi-source sensors is constructed to realize real-time monitoring of tower crane operation status, and the effective working hours and illegal operations of tower crane drivers (hereinafter referred to as "tasi") are monitored by combining the attendance records of personnel. But just do multi-source heterogeneous data integration and integration, all kinds of intelligent device, solves the site construction information system data inconsistency problem, not to make full use of these engineering data and deep mining, difficult to realize intelligent management of engineering construction of visualization, in order to improve the fine management of the construction site.

To solve the above problems, we adopted the following methods: (1) firstly, collect and clean real-time data through ETL (extraction-transform-loading) method, and generate the data warehouse of tower crane big data analysis platform for subsequent analysis and mining; (2) the classic statistical analysis method into the department of operations, working hours, scheduling and other factors affecting the analysis. Hope to objectively reflect the construction management problems through the results; We will use the "Internet of things + big data" to build smart construction sites, promote the fine, information-based and standardized management of construction sites, and realize green construction and ecological construction. It provides beneficial exploration for the safe management of construction machinery based on "Internet of things + big data" in China, and provides reference opinions for the construction of smart construction sites.

(2) Technical characteristics of special technical fields

With high-performance low-cost monitoring technology of Internet of things (TR - a LOT), the common carrier (camera, unmanned aerial vehicles) photogrammetry technology (TR - PS), numerical structure and large data analysis technology has developed a high support information management system of information management system, prestressed construction, high slope monitoring technology, roadbed informatization construction, bridge construction monitoring information technology.

(3) Smart site system integration capability

Top-level design ability, consulting project implementation ability. Comprehensive application ability of GIS, BIM and remote sensing technology.
5.3 Key technologies to be developed in the future

(1) The new generation of information construction system
System development, covering human misbehavior sensing technology, engineering machinery and AI technology with personnel, to perform collaborative work. In addition to the position, movement and state of the machine, it also integrates all the information of the construction site, such as the attitude, movement, status, noise, dust, temperature and other environmental data of the workers. Use AI to debate data, assess risk information, and communicate with the construction manager in real-time. Of construction policy and risk response monitoring and safety protection, construction machinery should be controlled by the Internet of things environment, and employees should be informed through wearable terminals worn by employees. Through this mechanism, we will achieve an innovative building system of productivity and safety.

(2) Concrete mixer overload and overspeed supervision system
As for overloading and overspeed supervision system of the concrete mixer, the most critical thing is to create a complete video image real-time monitoring network platform according to the GPS global positioning system and the actual load information feedback system. Because it is also part of the construction of smart site, and smart site is also an important part of the smart city, in some of the site traffic road, through the control of the advanced intelligent system platform, can effectively reduce or avoid the occurrence of traffic accidents.

(3) Protogeometric technique for earthwork engineering
During the calculation of soil increment, the field administrator only needs to go to an application dedicated to Android OS to shoot the measured target and automatically generate image data with highly accurate location information. The image data is transformed into three-dimensional point cloud data on the cloud and the volume is calculated. By sending the calculated data to the site administrator's smart phone, it can confirm the test results and soil volume of the 3d data to rate while staying on the site.

6. Summarizes
In this paper, the background and significance of the site environmental monitoring research, combined with the authentic site noise and dust monitoring need. It covers such functional modules as site management, equipment management, legal person user management, system management, data statistical analysis, data maintenance and over-limit alarm, etc., and mainly realizes the collection and statistics of noise and dust data in the construction process. All functional modules work effectively. This system can be utilized to monitor monitor the construction noise and dust emission in real-time and accurately, which provides a reliable basis for initial treatment and
prompt law enforcement.
The implementation of the system, to the construction of the environment to implement scientific information monitoring and management. Through the timely feedback of environmental data information, it can effectively supervise, control and adjust the construction situation of the project construction in real-time, quickly reflect and investigate the illegal construction, and provide an effective means for the construction of a healthy and good construction environment.
This system can carry on the informationization monitoring of the construction environment very well, brings many conveniences for the engineering construction enterprise and the related law enforcement department. However, with the actual operation of the system, the number of users, the total number of engineering projects, the number of equipment and the complexity of data will inevitably increase, and the usability and performance of the system will also face greater and greater challenges. The system needs to be improved in the following aspects.
(1) For the operation of the system, the amount of data earned by the system will continuously increase, which will virtually affect the speed of data query. Through the study of the internal mechanism of the database, optimize the query method, the creation of partition index, that is, the data partition, the creation of index on each data block, for the system can be day as the unit to create partition index, thus greatly reducing the number of indexes, improve the efficiency of the query.
(2) Users may be interested in historical data, but historical data may not be in the local database, so the system needs to retain the path or index directory of historical data, in order to temporarily extract it into the system database when being queried.
(3) In reality, serious noise and dust pollution may be found in the construction process, which requires urgent treatment. This requires the system to be able to send this alarm information as soon as possible to deal with this emergency. The emergency threshold value can be created in addition to the numerical alarm threshold value. When the system detects this data, it will immediately send this alarm message, even several times in a row.

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