

ANALYSIS OF REMOTE QUALITY INSPECTION SYSTEM FOR CONSTRUCTION PROJECTS

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Abstract: The technology for remote quality inspection system for construction projects like intergrated video , communication network and software integration technology, has achieved the text image data collection, remote experts quality inspection and improve the construction project management quality and efficiency, which has a good development prospect.

1 OVERVIEW

With the rapid development of Internet technology, the revolution of network and digital is very huge. Most people think that the traditional construction is changing because of this. Construction project Video monitoring, shown as Figure 1, system has always been a hot spot of application IT technology of construction projects. Since it has the features like mature technology, simple implementation, less investment, obvious benefit and simple operation, it has been used frequently by construction unit, project contracting units in the recent years.



Figure 1: Construction project Video monitoring system.

However, in recent years, There are many big projects like high-speed railways, airport expansion, urban rail transit. And there are also many high-rise building, like Shanghai center, the Beijing international. This requires a rather high quality of the construction project and the project management.

The construction unit is no longer satisfied with the traditional monitoring of the construction in progress. There are some problems need to be solved like how to solve the problems that the quality acceptance of long-rage and remain the acceptance fact during construction, how to use IT integration technology to bring more convenience for construction unit and improve traditional project management model, how to make a deeper use of video monitoring, communication network to meet the higher demand of project construction. Construction project quality inspection system is a breakthrough of the technology and application in this area. This paper will introduce the following three respects: basic structure of remote quality inspection system for construction projects, characteristics and advantages, and the use situation.

2 THE BASIC COMPONENT OF SYSTEM

Construction project quality inspection system use remote video to offer the information of project progress and remote coordination. We can upload pictures and sounds of construction site to Internet, to achieve image effects like in the real construction site.

Use video voice communication client software to achieve remote quality inspection of construction projects. We can display and storage the image of acceptance site, which is an important basis for inspection of the project quality.

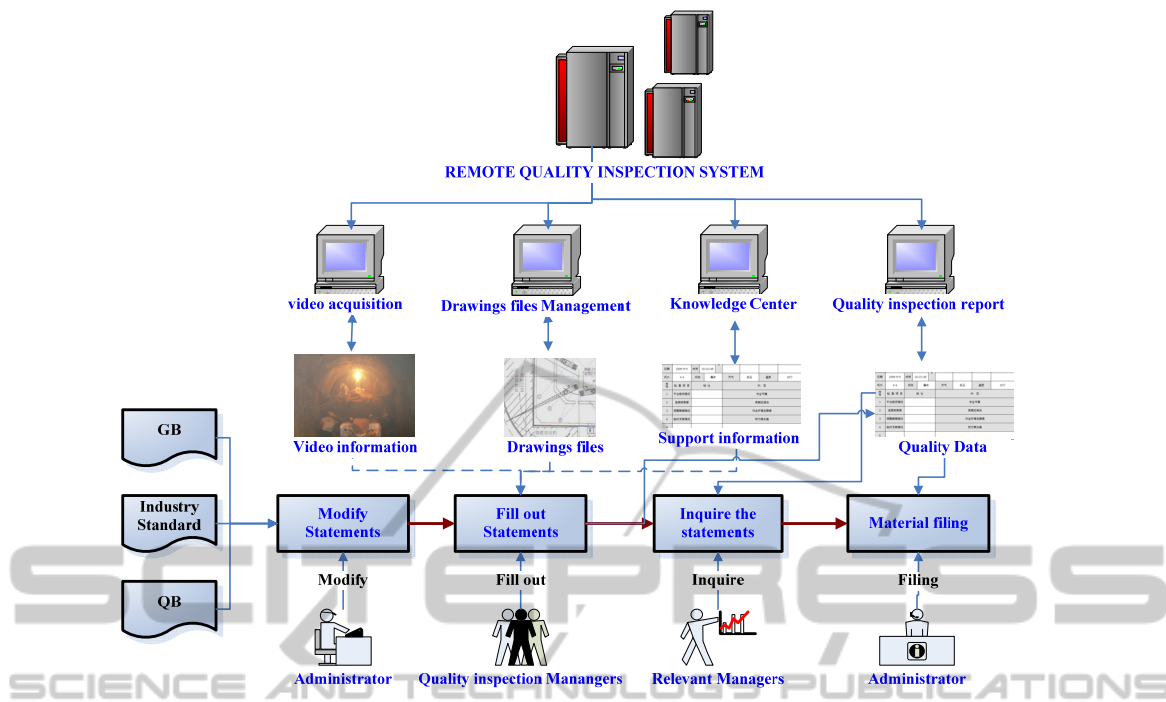


Figure 2: Basic component of system.

Construction project quality inspection system (Figure 2) is mainly composed by the remote video remote monitoring and acquisition subsystem, network transmission subsystems, JPG file management subsystem, the inspection statement subsystem, multimedia interactive subsystem, knowledge center subsystem and file management tool, which is integrated applications of video technology, network technology and software system.

2.1 Remote Monitoring and Video Acquisition Subsystem

Remote monitoring and video acquisition subsystem is the video data sources of the whole system, and is also the network and hardware parts. This subsystem record the video of construction site and transfer it to the remote management system. This subsystem has functions of video collection, transmission management, application storage, remote access management, quality checking application.

2.2 Network Transmission Subsystems

The network architecture design specification according follows IEEE802.11 / IEEE802.3. It's network architecture combines wireless network

with cable network, and use seamless natural roaming transition. Cable network composition high-speed information exchange network while wireless network extension data exchange space.

2.3 Drawings Files Management Subsystem

We can achieve electronic drawings input, management, and the integration of the whole acceptance system through this system. We can recall the corresponding drawings as the basis of reference and inspection record anytime when remote accept.

2.4 Quality Inspection Report Subsystem

Quality inspection report subsystem is used to deal with corresponding inspection reports, to achieve maintenance and maintenance of reports, and the interact with the whole system and other subsystems. This subsystem obeys corresponding laws and standard regulations, and can be customized by enterprise, to meet different demands.

2.5 Multimedia Interactive Subsystem

During the quality acceptance, acceptance center

staff and site person can communicate in real time. Which can improve efficiency of quality inspection and accuracy of inspection parts. When remote inspection, we can also achieve management, communication, command and resolve technical, knotty, accidents, management problems with remote experts and leaders on the Internet.

2.6 Knowledge Center Subsystem

This subsystem collects the corresponding rules and standard and so on, which offers knowledge support for acceptance.

3 NETWORK ARCHITECTURE DESIGN

This system uses network architecture of cable and wireless, which makes the system has high speed and flexible. The design of network architecture should consider the network design of project principal part, project quality inspection indoor network layout and network integration connection parts.

3.1 Engineering Subject Network

Core network uses cable network, which vertical breakthrough of each floor of engineering subject. Floor branch networks use local wireless network to ensure network transmission of information.

3.2 Project Quality Inspection Indoor Network

Project quality inspection indoor network uses cable LAN architecture, focus on the interaction of quality inspection management system and inspection staff. There are high-powered network switches and server equipment in indoor LAN, to ensure the efficient operation of video inspection system operation.

3.3 Network Integration

Cable networks are divided into main network of engineering subject, local area network of quality inspection department, shown as Figure 3.

Wireless networks are divided into connection between fixed and movable points and sub-nodes within the floor and connection between engineering subject and the quality inspection department.

4 SYSTEM APPLICATION INTEGRATION AND INTERFACE DESIGN

System master control interface is divided into five parts, video display and control, information file, drawing information, the main display area and the function calls, shown as Figure 4. The size of information file, drawing information and the main display image regions can be altered or hidden.

The function interface of the software can be adjusted and changed.

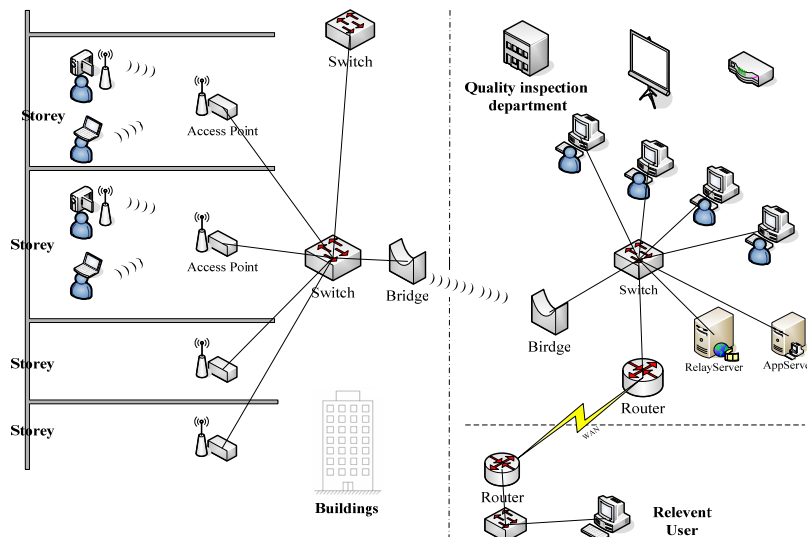


Figure 3: Network architecture.

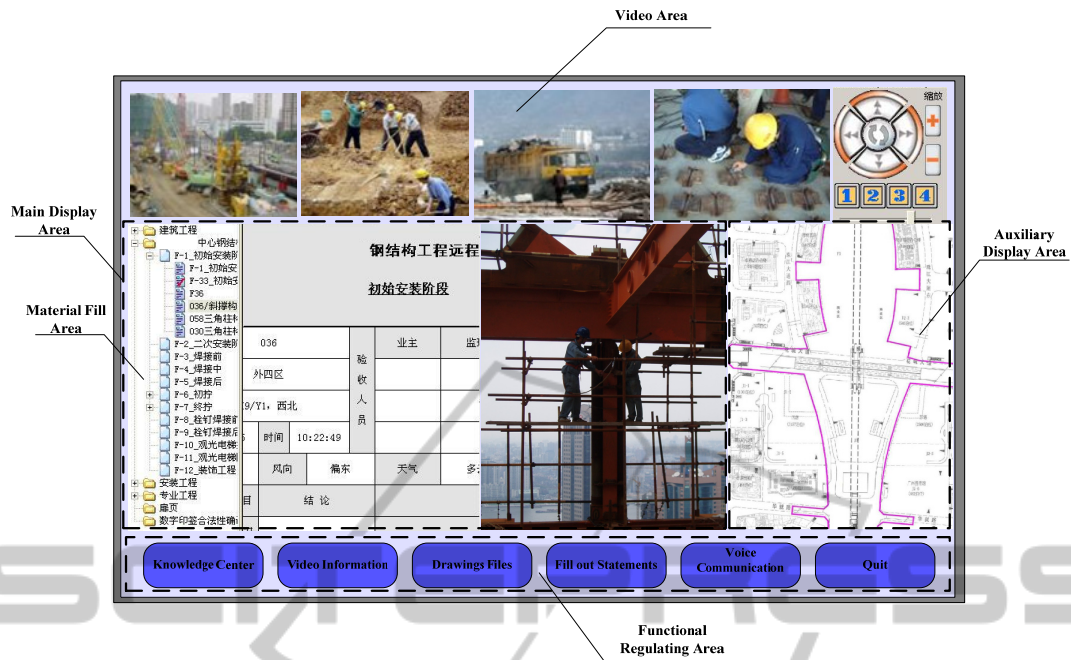


Figure 4: Remote quality inspection system main interface design.

5 CONCLUSIONS

Remote quality inspection system for construction projects can achieve remote monitoring, camera and video. And achieve the remote quality inspection when inspectors cannot get to the construction site. It integrates quality inspection material filled, electronic drawing files management, remote monitoring and management in one platform. In the following development of remote quality inspection system for construction projects, the problems of equipment miniaturization, reducing equipment weight, lifting equipment portability and inspection scheduling aspects should be focused, to get better effect.

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