

# Research on the Construction Mode and Value of Intelligent Construction Cultural Tourism Projects

Xuejun Ouyang\*

Jiangxi Provincial Tourism Group, Nanchang 330200, Jiangxi, China

\*Corresponding author: Xuejun Ouyang, hdp816@163.com

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**Abstract:** In the process of cultural and tourism project construction, intelligent construction technology has gradually shown strong advantages. The effective application of this technology not only greatly improves the construction efficiency and quality of cultural and tourism projects, but also effectively controls construction costs, laying a solid foundation for the green, low-carbon, and sustainable development of the cultural and tourism industry. The article analyzes the current situation of cultural and tourism project construction, proposes the advantages of intelligent construction and its application in the construction mode of cultural and tourism projects, aiming to provide reliable guidance for the sustainable development of cultural and tourism projects.

**Keywords:** Intelligent construction; Cultural and tourism projects; Construction mode

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## 1. Introduction

Against the backdrop of rapid technological development, intelligent construction technology, with its efficient, precise, and sustainable characteristics, is gradually leading a profound transformation in the construction industry. In the field of cultural and tourism project construction, the application of intelligent construction has become a key driving force for improving project quality, accelerating construction processes, and reducing operating costs. With the integration of advanced technologies such as big data, cloud computing, and the Internet of Things, intelligent construction technology provides unprecedented design flexibility, construction accuracy, and intelligent operation and maintenance for cultural and tourism projects. Therefore, an in-depth exploration of the construction mode of cultural and tourism projects oriented towards intelligent construction and the value it brings has profound significance for promoting the transformation and upgrading of the entire cultural and tourism industry and high-quality progress.

## **2. Current situation of cultural and tourism project construction**

In the context of current socio-economic development, the construction of cultural and tourism projects is advancing at an unprecedented rate, reflecting a notable shift toward diversification and expansion. From historical and cultural cities to modern theme parks, from natural landscape development to cultural experience projects, the types of cultural and tourism projects are becoming increasingly diverse, which can better meet the growing spiritual and cultural needs of the public. With the continuous advancement of cultural and tourism project construction, the drawbacks exposed by traditional construction methods are becoming increasingly prominent. The high construction costs, inefficient construction processes, and difficult to guarantee building quality have become the main bottlenecks restricting the further development of cultural and tourism projects <sup>[1]</sup>. Traditional construction methods often rely on manual operation and empirical judgment, lacking scientific management and advanced technical support, resulting in frequent problems such as resource waste, project delays, and uneven quality. In order to solve these urgent problems, intelligent construction has emerged, bringing new dawn and infinite possibilities to the construction of cultural and tourism projects <sup>[2]</sup>. Intelligent construction achieves digitalization, automation, and intelligence of the construction process by introducing advanced information technology, automation technology, and intelligent equipment. It can effectively reduce construction costs, improve construction efficiency, ensure building quality, and inject new vitality and momentum into the sustainable development of cultural and tourism projects.

## **3. Value of intelligent construction in cultural and tourism project construction**

### **3.1. Reduce construction costs**

The application of intelligent construction technology has played a crucial role in reducing the construction cost of cultural and tourism projects. Through precise construction simulation, intelligent construction can comprehensively and meticulously plan the construction process before the project starts, effectively reducing material waste during the construction process. At the same time, advanced design software enables intelligent construction to continuously optimize design plans, ensuring minimal material usage while still meeting project requirements <sup>[3]</sup>. Additionally, intelligent construction can significantly enhance efficiency through automated and smart construction methods, reducing labor costs, shortening the construction timeline, and ultimately lowering overall project costs. For example, intelligent robots and automation equipment can replace manual labor for dangerous or repetitive tasks, not only improving work efficiency but also reducing personnel safety risks. The intelligent construction management system can monitor the construction progress and resource consumption in real time, ensuring that the project progresses smoothly according to plan and avoiding additional costs caused by delays.

### **3.2. Improve construction efficiency**

Intelligent construction technology can achieve intelligent and automated control of the construction process by integrating advanced information technology and automation technology, thereby effectively improving the progress of construction. During the construction process, intelligent devices can automatically perform preset tasks such as precise material handling, component assembly, etc., without frequent manual intervention, greatly improving construction speed. At the same time, the intelligent construction system can also monitor the construction status in real time, adjust the construction plan promptly, and respond to various unexpected situations that may arise. In addition, intelligent construction can also reduce the impact of human factors on construction

progress. In traditional construction methods, human factors often become one of the main reasons for project delays. Intelligent construction, through precise construction simulation and automated construction management, can minimize human errors and delays, ensuring that projects can proceed smoothly as planned and be completed on time.

### **3.3. Improve the quality of construction**

The application of intelligent construction technology in cultural and tourism project construction can ensure that every aspect of the building meets relevant standards and requirements through strict construction monitoring and quality inspection methods, thereby guaranteeing the overall quality of the building from the source. During the construction process, the intelligent construction system can monitor the construction status in real time and dynamically evaluate the construction quality. Once a quality issue is discovered, the system will immediately issue a warning and guide the construction team to take corresponding measures for rectification, ensuring that the problem is resolved promptly. In addition, intelligent construction can accurately measure and analyze building materials and components. With the help of advanced sensors and detection technology, intelligent construction can obtain real-time performance indicators of materials and components, ensuring that they meet design requirements. This not only helps improve the durability of buildings but also significantly enhances their safety, providing tourists with a safer and more reliable cultural and tourism experience.

## **4. Analysis of the construction mode of cultural and tourism projects for intelligent construction**

### **4.1. Application of BIM technology**

BIM (Building Information Modeling) technology, as one of the core technologies in the field of intelligent construction, is gradually changing the traditional mode of cultural and tourism project construction. With its multiple advantages such as visualization, coordination, simulation, and optimization, BIM technology plays a crucial role in the design, construction, operation, and maintenance of cultural and tourism projects throughout their entire lifecycle. Firstly, in the design phase, BIM technology can assist designers in optimizing their design plans. By constructing precise 3D models, designers can more intuitively display the overall layout, spatial relationships, and detailed design of cultural tourism projects, making it easier to identify potential design issues and make corrections<sup>[4]</sup>. In addition, BIM technology also supports the adjustment and optimization of design parameters, which can make the design scheme more in line with aesthetic and economic requirements while meeting functional requirements.

Secondly, during the construction phase, the application of BIM technology is mainly reflected in the simulation and monitoring of the construction process. Through BIM technology, the construction team can simulate the construction plan in detail, including construction sequence, resource allocation, schedule control, etc., to ensure the smooth progress of the construction process. At the same time, BIM technology can also monitor construction progress and resource consumption in real time, identify and solve problems during the construction process in a timely manner, and effectively avoid project delays and cost overruns. Finally, in the operation and maintenance phase, BIM technology also plays an important role. Through BIM technology, the operation and maintenance team can easily access key information, such as building equipment and pipelines, enabling intelligent and efficient operation and maintenance management. This can not only improve operation and maintenance efficiency but also timely detect and handle equipment failures, ensuring the safe and stable

operation of cultural and tourism projects.

Taking the Jinling Small Town Cultural and Tourism Project as an example, the project fully utilizes the advantages of BIM technology and carries out a series of work such as data gene coding, parameterized module construction, intelligent recognition, and precise mapping. Through BIM technology, the Jinling Small Town project has achieved digitalization and standardization of traditional wooden buildings, not only improving construction efficiency but also reducing construction costs. During the construction process, BIM technology also helps the construction team achieve visualization and refined management of the construction process, ensuring the quality and safety of the construction. During the operation and maintenance phase, BIM technology also provided strong support for the operation and maintenance management of the Jinling Small Town project, achieving intelligent and efficient operation and maintenance management.

#### **4.2. Construction of lean construction system**

Lean construction, a production management concept derived from the manufacturing industry, focuses on continuously reducing waste, optimizing processes, and enhancing efficiency. In the construction of cultural and tourism projects, the establishment of a lean construction system is not only an innovation of traditional construction methods but also an important guarantee for promoting high-quality and efficient completion of projects. Firstly, lean construction emphasizes the optimization and efficient utilization of resources. In the construction of cultural and tourism projects, it is necessary to plan materials, equipment, manpower, and other resources reasonably from the design stage to ensure that each resource can be maximally utilized. Through precise construction plans and strict cost control, lean construction can effectively reduce resource waste and lower project costs.

Secondly, lean construction emphasizes the refined management of the construction process. The construction team should have a high degree of collaborative work ability and be able to advance the work in an orderly and efficient manner according to the established construction plan. Under the lean construction system, every step of the construction process is carefully analyzed and optimized to ensure a smooth and efficient workflow. Meanwhile, lean construction also emphasizes strict control over construction quality. Through regular quality inspections and evaluations, it can ensure that project quality meets relevant standards and requirements. Thirdly, lean construction also focuses on improving the collaborative work ability of the construction team. In the construction of cultural and tourism projects, the construction team is often composed of multiple professional groups, each responsible for different construction tasks. Lean construction can promote information sharing, communication, and collaboration among teams by introducing advanced project management methods and tools such as project management software and collaborative work platforms. This not only improves work efficiency but also enhances the overall collaborative combat capability of the team, ensuring that projects can be completed on time and with quality.

#### **4.3. Collaborative application of lean construction and BIM technology**

The collaborative application of lean construction and BIM technology is an innovative and efficient model in the intelligent process of cultural and tourism project construction. The combination of these two technologies can not only leverage their respective advantages, but also complement and promote each other, bringing revolutionary changes to the construction of cultural and tourism projects. On the one hand, BIM technology provides precise data support and construction simulation for lean construction with its powerful visualization

and simulation features. BIM technology enables project teams to create precise 3D building models, allowing for the visual representation and analysis of design concepts. This not only helps identify potential design issues but also facilitates detailed simulations prior to construction. By predicting various scenarios during the construction phase, BIM provides a data-driven foundation for informed decision-making, ensuring more accurate and efficient construction processes<sup>[5]</sup>. At the same time, BIM technology can also update project data in real time, ensuring the accuracy and timeliness of information in the lean construction process.

On the other hand, the concept and methods of lean construction can guide the application and optimization of BIM technology. Lean construction emphasizes reducing waste and improving efficiency, which requires the application of BIM technology to closely focus on project goals and carry out refined management and optimization. In the application process of BIM technology, the project team needs to follow the principles of lean construction, continuously optimize, and adjust the model to ensure a smooth and efficient construction process. At the same time, lean construction emphasizes teamwork and continuous improvement, which requires the application of BIM technology to have good information sharing and communication mechanisms, so that team members can timely understand project progress and problems and jointly promote the successful implementation of the project. In short, the collaborative application of lean construction and BIM technology is an important mode of intelligent construction in cultural and tourism project construction. The promotion and application of this model will help improve the construction level of cultural and tourism projects and promote the sustainable development and value to the cultural and tourism industry.

## 5. Conclusion

In summary, the application of intelligent construction in cultural and tourism project construction has significant advantages. Through BIM technology, lean construction system, and their collaborative application, it is possible to reduce construction costs, improve construction efficiency, and ensure building quality and maximize the project value. In the future, with the continuous development and improvement of intelligent construction technology, its application prospects in cultural and tourism project construction will be even broader. Therefore, in the construction process of cultural and tourism projects, it is necessary to actively promote and apply intelligent construction technology to promote the sustainable development and the value of the cultural and tourism industry.

## Disclosure statement

The author declares no conflict of interest.

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