

Engineering Project Management and Functional Design of Hotel Construction

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Abstract

According to the characteristics and requirements of hotel design project management, this paper expounds on the basic concept and management mode of engineering project management. It puts forward the related issues of hotel construction function design and construction project management of construction engineering hotel buildings. Furthermore, conduct systematic research on the problem, and give relevant opinions and suggestions. This article aims to provide suggestions for hotel project management, which can help standardize hotel architectural design and comprehensive project management, achieve the effectiveness of the entire implementation process, and promote the development of hotels. Completion of architectural functions and construction project management's relevant economic value significance.

Keywords

Project Management; Engineering; Hotel Construction; Functional Design.

1. Introduction

Construction project management involves a wide range of fields and a high degree of cross-domain, especially in the construction stage of a construction project. The quality of construction management work is directly related to the construction project's progress, project construction quality, project construction order, project, et al., and whether it can pass the qualification inspection. Construction management personnel must have a solid management foundation and systematic construction professional training to ensure the quality and construction efficiency of construction projects. Under the background of comprehensive mechanization and informatization development of the construction industry, construction projects require BIM intelligence and low-carbon functionality. Therefore, although construction machinery and Internet information technology have brought many conveniences to construction projects and saved many construction costs, the owners' requirements for construction projects are also constantly improving. The current construction management level in the industry still has much room for improvement. The development speed has surpassed the development speed of construction management. If the research on construction management of construction projects is not strengthened, it will have many adverse effects on the development of the modern construction industry. However, hotel construction is relatively comprehensive, involving hotel project planning and design, project construction progress, quality, cost control, project financing and risk management, hotel team building management, project contracting, material equipment procurement management, coordination of all parties et al., which involved in hotel project construction Management. so the construction site management of the hotel is a crucial factor in determining the construction level of the construction project. In order to improve the safety and stability of hotel construction functions, it is necessary to do a good job in project management and grasp the quality of each link in the construction stage. It is also necessary to continuously improve the

management level through modern management models and management measures to ensure the smooth construction of construction projects.

2. Relevant Theories of Engineering Project Management and Hotel Project Development Procedures

2.1. The Meaning of Engineering Project Management

Engineering project management refers to effective planning, decision-making, organization, coordination, control, and other management activities using system engineering theories, viewpoints, and methods within the life cycle of engineering projects, Expected quality, duration, and investment control objectives. The Royal Chartered Institute of Construction expresses it as follows: from the beginning of the project to the completion of the project, through project planning and project control, the quality objectives, schedule objectives, and cost objectives of the project can be realized. This expression is endorsed by many national builders' organizations and engineering management associations [1]. Compared with traditional enterprise management, engineering project management has the characteristics of complex principal-agent management, interdisciplinary organization and management, and one-off projects. Establishing a centralized leadership model and a unique project organization structure is necessary, and carrying out work creatively is necessary. At the same time, the project's general manager plays a significant role in the project management. He is the soul of the project management organization and the critical person who determines the success or failure of the project. The general manager of the project needs to consider issues from the perspectives of different professions and, through the management of people, give full play to the enthusiasm and creativity of the project personnel to form an efficient management team with a high degree of tacit cooperation, enthusiasm, and enterprising spirit.

2.2. Classification of Engineering Project Management

It can be classified according to the construction stage and management subject. If classified according to the management subject, project management can be divided into project management of the owner and project legal person, project management of the design unit, project management[2] of the contractor, and project management of the consulting and supervision unit. . The work of engineering project management of construction, resume, design and other related units is mainly reflected in the preliminary planning and feasibility study phase of the engineering project, the engineering design phase, the engineering bidding phase, the engineering construction phase, the engineering acceptance and the putting into operation phase. The owner's project management should be systematic and forward-looking, focusing on the final goal of project management, providing effective products or services, and maximizing project benefits.

2.3. Engineering Project Management Mode

The engineering project management mode refers to the sum of various relationships formed between the project participants under the arrangement of relevant systems during the implementation of the project, which determines the handling of project assets and future benefits by all project participants., use, occupation, and other rights. In a broad sense, it refers to the combination of different financing methods adopted by project sponsors or investors to meet the needs of project construction funds, including the economic and legal relations of financing parties and corresponding contractual arrangements. In a narrow sense, it refers to the cooperative relationship and corresponding contractual arrangements formed between the project owner/legal project person and other project participants under the framework of relevant construction laws and regulations; From the point of view, the narrow engineering

project management mode is also called the engineering project transaction mode, which includes transaction methods and contract arrangements.

3. Transaction Method, Type and Development Process of Hotel Engineering Projects

3.1. Overview of Contracting and Management Service Transactions

There are mainly five types of outsourcing transactions [3]:

- 1) DDB mode, that is design-tender-build mode. In this mode, the project contracting enterprise undertakes part or all of the construction tasks of the project according to the contract. This method is currently one of the most common contracting modes in the world.
- 2) GC mode, the general construction contract mode, refers to the public engineering contracting enterprise undertaking the design and construction of the engineering project according to the contract.
- 3) DB mode, that is design-construction mode. Refers to the general contracting enterprise undertaking the design and construction of the project according to the contract, and is fully responsible for the quality, safety, construction period, and cost of the contracted project.
- 4) EPC mode is design-purchase-construction/turnkey project general contracting. Refers to the general engineering contracting enterprise undertaking the design, procurement, construction, and trial operation services of the engineering project according to the contract and is fully responsible for the quality, safety, construction period, and cost of the contracted project.
- 5) The Partnering mode, that is, the partner mode, is a transaction mode that determines the common goal of the construction project based on fully considering the interests of all parties involved in the construction. Participants are required to trust each other, cooperate, share risks and costs, and ensure that the interests and goals of all parties are realized.

There are four types of management service transactions:

- 1) PM mode, that is, the project management mode. In this mode, the engineering project management enterprise is entrusted by the project owner and, according to the contract, represents the owner to carry out the management and service of the whole process or several stages of the organization and implementation of the engineering project.
- 2) The PMT mode, that is, the integrated project management mode, refers to the integrated operation of the owner or project legal person and the project management company in the organizational structure, project procedures, and project design, procurement, construction, and other management links, to realize the optimal allocation of resources.
- 3) CM mode, that is, the project contracting mode. In this mode, the owner/project legal person selects a general contracting company with construction experience from the beginning of the project to participate in the construction project implementation process to provide constructive suggestions for designers and be Responsible for managing the construction process.
- 4) The PMC mode, that is, the project management contracting mode, means that the engineering project management enterprise shall, following the contract, not only complete all the work of project management services but also be responsible for the project's preliminary design as stipulated in the contract. This mode requires the project management contracting enterprise to bear a certain degree of managing risk and economic responsibility according to the contract.

3.2. Project Transaction Contracts and Their Types

A contract is an agreement between natural persons, legal persons, and other organizations of similar subjects to establish, modify, and terminate civil rights and obligations. A construction project transaction contract is a contract whose object is a construction project or is related to a construction project. According to the different methods of contract valuation, it can be divided into two categories: price-based and cost-based.

1) A price-based contract. In price-based contracts, the prices used are determined before project implementation, and the owner bears less risk. Standard such contracts include lump-sum contracts and unit-price contracts. A lump-sum contract refers to a contract in which the contractor pays for all the project costs. This contract requires straightforward project content, complete design drawings, accurate project scope, and engineering measurement basis. Otherwise, the risk is relatively high. A unit price contract refers to a contract in which the unit price of the project is determined, the quantity contract only stipulates a reference value, and the settlement is calculated according to the actual quantity of the project. The unit price contract also requires complete design drawings, accurate work scope, and measurement basis.

2) Cost-based contracts. In this type of contract, the contract's price cannot be determined before the project is implemented. The actual project cost must determine after the project is completed. The owner bears the risk of rising project costs. Common types of contracts of this type include actual cost plus remuneration contracts, target price incentive contracts, and limited maximum price contracts. The former is suitable for situations where the project content could be more sure and fair to both parties, while the latter belongs to incentives. In this type of contract, the contractor must promise to bear certain risks.

3.3. Development Flow Chart of Star Hotel



Figure 1. project planning stage

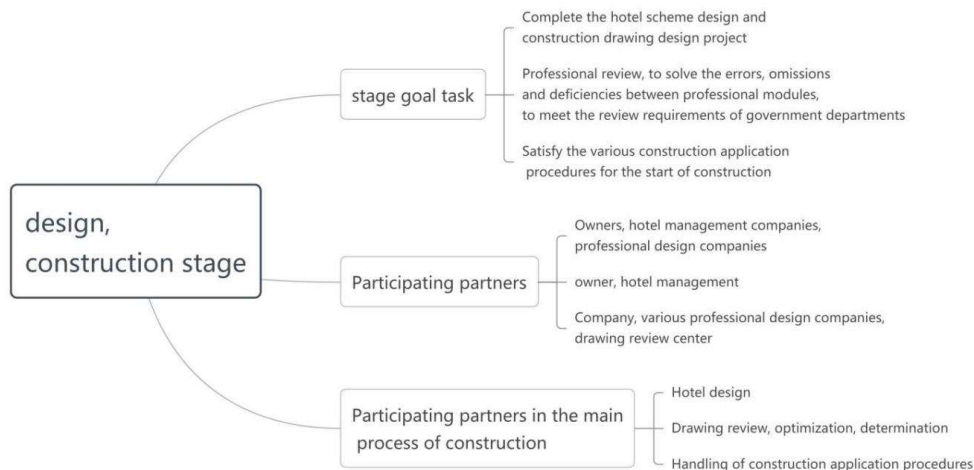


Figure 2. Project operation and use phase

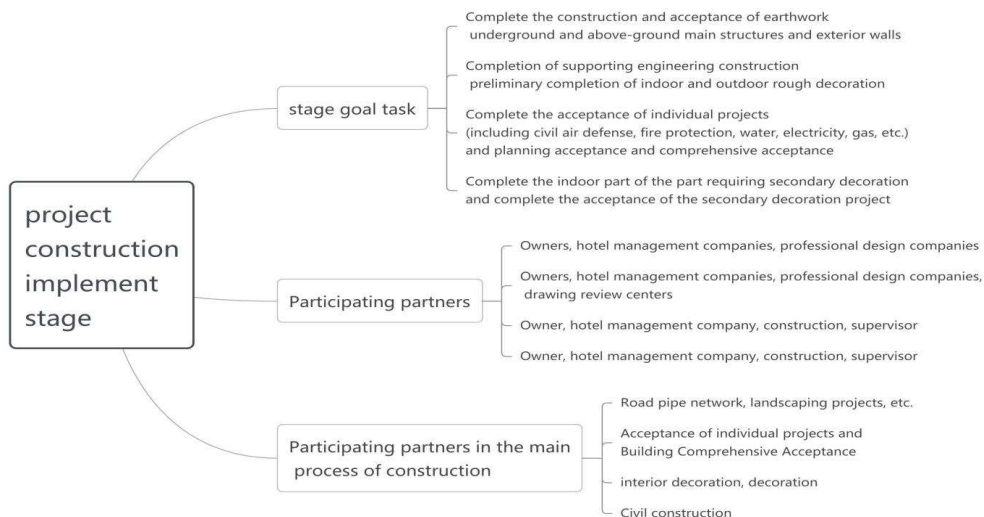


Figure 3. Project Construction Implementation Phase



Figure 4. Project operation and use phase

4. Project Management of Star Hotel Building Construction

4.1. Design Problems of Star Hotel Project Management

In the architectural engineering design of star hotels, there is a common problem of modifying drawings and design schemes before construction, which cannot guarantee the construction quality of architectural projects. Star hotel construction projects differ from civil and commercial construction projects regarding project management characteristics and quality requirements. It is necessary to build high-quality and high-standard buildings based on the actual needs of star hotels to provide medical services. Provide a stable and safe environment [4]. In the design work, the designers must do an excellent job in research, combining the characteristics of star-rated hotel buildings with the quality requirements of modern star-rated hotels. Considering various aspects, the designers must improve the pertinence and rigor of the design. However, in actual work, it is found that most star hotel buildings have the problem of modifying drawings and design schemes, which cannot support the development of high-standard construction project management. The reasons for this problem are: First, designers must understand the particularity of star hotel architecture. Using ordinary architectural design thinking to carry out design work cannot reflect the depth and rigor of the design. Because the understanding of star hotel architecture needs to be put in place, there are problems in the preliminary design, which need to be modified and improved before construction. Second, there is little interaction with hotel management personnel, and they need to understand the operation mode of star-rated hotels, so they cannot provide a reference for high-quality design work.

Star-rated hotels have higher requirements for appearance, recycling, and workplaces. It is necessary to understand the architectural needs of various hotel departments through interactive methods and be able to design solutions that conform to the management model of star-rated hotels. Because the communication between the daily construction unit and the hotel management personnel is not in place, the owner needs help understanding the building performance and functional usage of the hotel. They are only the investment group of the project, so there will be repeated revisions before construction, and construction changes will increase the pressure on project management.

4.2. Material Issues in Hotel Project Management

Star Hotel construction projects involve many building materials, such as construction equipment, construction materials, decoration materials, etc. By managing building materials, the quality of engineering projects can be improved, and the service work of star hotels can be facilitated. However, the following problems were found in actual work: First, some construction units needed to realize the importance of engineering material management, neglected the construction of a professional team, and could not provide support for efficient management of building materials. Due to the weak awareness of material management, resources are wasted or abused in the construction process [5]. Second, need for more awareness of quality control. The quality of building materials will have a direct impact on construction projects. If materials that do not meet the standards are used in the construction process, it will directly impact the complete acceptance and the use of the building. Some construction material procurement personnel need to be aware of construction material quality management, and there are shoddy and fraudulent phenomena in the procurement process, which seriously affect the management level of construction projects.

4.3. Circular Low-carbon Issues in Hotel Project Management

Low-carbon hotels are an essential building business field in developing construction projects, and there are many building energy-saving design issues. Nevertheless, at present, the architectural designers of many enterprises need to learn the functions of the hotel, and the

owners and enterprises also need more communication. Many hotels need more functional problems of the low-carbon cycle, or the functionality of the low-carbon cycle needs to be improved. For example, there needs to be a better ventilation cycle design, and it is entirely dependent on electric energy to meet the ventilation cycle of the hotel instead of directly designing natural ventilation corridors based on the main body of the building for ventilation. Alternatively, no renewable energy building facility is reserved, and we can only blindly rely on the natural energy supply, which cannot promote the recycling of energy, leading to a significant increase in carbon emissions. Alternatively, the design of energy-saving equipment is unreasonable, and the sewage treatment system needs to be better, resulting in the waste of water resources and environmental pollution

4.4. Construction Issues in Hotel Project Management

In the construction of star hotel construction projects, there are situations where the construction team needs to be more experienced, and the construction operation needs to be corrected. Currently, most of the construction units undertaking star hotel construction projects need to gain construction experience in them, and the projects they undertake are mainly civil and commercial construction projects. Although the owner will provide construction plans and drawings to the construction unit and provide relevant guidance and supervision, the construction team needs more relevant experience. It cannot support construction project management work. This problem is a common problem in the project management of star hotel construction projects. While affecting the quality of project management, it cannot provide experience for the development of star hotel construction work. In the management of star-rated hotel construction projects, in order to improve the quality of the construction project and promote the smooth progress of project management, it is necessary to base oneself on the architectural characteristics of star-rated hotels, combine industry standards and requirements, and start from multiple aspects to do a good job. Managing multiple links such as pre-construction, construction process, and completion can improve the management level of engineering projects and promote the stable development of medical services.

4.5. Strengthen Pre-construction Management

Star hotel construction projects have the characteristics of significant investments and long periods [6]. If the pre-construction preparations are not in place, it will harm the project management and cannot guarantee the quality and progress of the project. Combining the problems existing in the management of construction projects in the past, according to the characteristics of construction projects of star hotels, we can start from the following aspects: First, strengthen the analysis and review of construction design and drawings to ensure that each construction link can be completed promptly-implementation on the construction site. Construction design work plays a guiding role in construction projects and is the premise of project construction. Through the analysis of construction drawings and design schemes, we can know whether the scheme is consistent with the construction site conditions and whether it can be used in practice, which is of great significance to subsequent construction management. In actual work, modern information technology, such as BIM, presents construction drawings three-dimensionally and discusses and analyzes design details. If problems are found during the audit, rectification work needs to be done until the construction standards of star-rated hotels are met. After the design scheme is completed, it is necessary to analyze the process and technology designed in the design scheme to judge whether it is safe and environmentally friendly. If there are problems, based on the building standards of star hotels, select suitable materials and technologies to control project costs and improve capital management effects [7]. In addition, the procurement of construction engineering materials should be done well, and suppliers with credit qualifications and production capacity should be selected through market

research to control the quality of construction materials from the source. Third, strengthen quality management. Construction quality management runs through the entire project. If there are quality problems in the design or construction process, it will have a more significant impact on the construction unit. Therefore, it is necessary to do an excellent job in quality control work, adopt the whole process of quality management work, and carry out quality control work before construction, during construction, and after construction, and require staff to implement responsibilities following the quality management system and do an excellent job in quality supervision and control, to promote the smooth progress of star hotel construction projects.

4.6. Strengthen Construction Process Management

First, improve the building material management system. In the construction process, the requirements for building materials are relatively high, and the staff needs to manage the storage and delivery of materials to ensure that the construction materials are fully utilized. Set up a special material management team and require the team to do an excellent job managing building materials. After the team members are determined, a material management system is formulated to determine each employee's responsibilities and work content and require them to manage building materials based on the rules and regulations. In order to improve the management effect of building materials, information technology can be introduced to build an information management platform to improve the management effect of building materials and provide a guarantee for high-quality work. Take warehouse access software as an example, the software can be independently configured according to different rules of the enterprise, so that the warehouse access software can be adapted according to the actual warehouse management status of the enterprise, thus allowing the warehouse access software to guide the warehouse management personnel to operate efficiently and effectively improve the efficiency of warehouse management. It is used to manage construction engineering materials to realize the dynamic management of construction materials and ensure the rational use of materials. Second, strengthen the construction of construction personnel. Because of the need for more experience construction personnel, relevant training activities can be organized. The characteristics, precautions, and construction critical points of the star hotel construction project can be used as the training content so that the construction team can form a preliminary understanding of this during the study, understand. The characteristics of the project, and strictly operate following the rules and regulations. In addition, experts in star hotel construction engineering can also be invited to give lectures, use star hotel construction cases to deepen the construction personnel's understanding of star hotel construction engineering, and support the construction of star hotel construction projects [7]. Finally, do an excellent job in safety training and publicity in the construction process. Safety training and publicity work are essential in star hotel construction projects, and it is a vital medium to improve construction personnel's safety and self-protection awareness.

4.7. Circular Low-carbon Implementation Plan for Hotel Project Management

In hotel project management, attention should be paid to the logical operation of multiple energy sources. The organizational structure of the energy supply determines the degree of carbon emissions to a large extent. Increasing the renewable share of resources in energy consumption and applying new technologies can help hotels increase the utilization rate of renewable resources. Hotels should pay attention to their low-carbon design at the initial stage. Regarding infrastructure construction and facility configuration, it is necessary to communicate in detail with designers and carefully select suitable environmentally friendly and energy-saving equipment. Take room 2 Chiswick, the first-lifetime net-zero-carbon hotel of the famous British furnishing company Lamington Group, as an example. The hotel has become the UK's first full-lifecycle zero-carbon hotel "hotel." Through on-site renewable energy, the hotel building converts 100% of its energy needs into heating, cooling, and the hotel's proprietary

smart building and feedback systems improve occupancy performance through the sum of incremental benefits. Inside, two "labs" provide data on energy, air quality, and drinking water and learn from guest behavior patterns. Melissa Gooding, the group's sustainability expert, said: " In the future, all HomeTel room 2 net-zero building code, making it a full-lifecycle net-zero building and focusing on the critical need to reduce embodied carbon throughout the design phase and achieve net-zero operations throughout the life of the building. The hotel building allows university partners to use new technologies and interventions to reduce energy consumption and carbon footprint. The test data will be used to advance the hotel's net-zero building framework as a pioneering example of the built environment.

4.8. Do a Good Job in Construction Supervision and Acceptance Management

Star hotel construction projects, supervision, and acceptance work are significant and necessary to promote the smooth implementation of various tasks. In order to improve the completion of the construction project within the stipulated realization, the following work needs to be done: First, strengthen the supervision of the progress of the project implementation. Suppose there is a problem between the construction plan and the actual project progress during the supervision. In that case, it should interact with the supervision department in time to understand the cause of the problem and ask the construction unit to do a good job of rectification to avoid affecting the entire project's progress. The supervision department guarantees construction quality, progress, safety, and other work. Through this department's participation in supervision, problems can be found in time to avoid construction risks that adversely affect construction enterprises. In practical work, strengthen interaction with the preparation department, increase communication frequency, understand project construction situation, and support the development of high-quality star-rated hotel construction project management. Second, do an excellent job in completing acceptance. Star hotel construction projects involve much content, and the complete acceptance personnel must do an excellent job in inspecting and reviewing details and critical construction links to avoid the situation that the acceptance is not in place [8]. In the acceptance work, there will be situations where the construction quality is qualified, but it needs to meet the star hotel indicators. If such problems are found, the building needs to be changed, and the construction personnel must do a good job of tracking to ensure that the building quality meets the building quality standards of a star hotel. Third, do a good job collecting information and providing references for follow-up work. In star hotel construction projects, more materials and information are involved. If information management is in place, there will be sufficient evidence in the follow-up acceptance or audit. Therefore, information collection and management should be done well in managing star-rated hotel construction projects, and materials and data related to construction projects should be organically integrated and stored in archives to provide references for solving problems.

5. Conclusion

The importance and necessity of the complete life cycle management of large hotel design projects have attracted more and more attention from managers. The author not only interprets the conceptual problems of star hotel project management from various angles but also analyzes the current problems in hotel project construction management, puts forward corresponding solutions based on related problems, and provides a basis for the systematic construction project management of the whole process. It provides a clear idea and has fundamental practical significance.

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