ABSTRACT

In order to response the multiple challenges of the railway station construction in this new period, and make the construction of the station precisely, superiorly and bigger, this article is based on the exploration in the development of the lean thinking and the characteristics of the railway station in the new period, aiming at the shortcomings of the traditional construction theory, combining the lean thinking and the characteristics of the railway station construction, coming up with the lean thinking model innovatively. It enriched the theory of the railway station construction, laid a theoretical foundation of making the boutique station and reaching the long-term development.

KEYWORDS
Lean thinking; Railway station; Ideological breakthrough.

INTRODUCTION

With the development of economy and technology, railway construction is also developing in a high speed. In the new period, the construction of railway construction is not only to be controlled in the whole, but also in details. In fact, the traditional construction concept cannot meet the construction requirements of the new era of railway construction, so we urgent to adapt to the ideological guidance of the construction of railway station.

LEAN THINKING

Lean thinking connotation.

Lean thinking comes from the production of Toyota mode, and its core ideas can be summed up to eliminate waste and create value, and by improving the quality of the product delivery and reducing the cost to improve the profit margin and competitiveness of the enterprises.

The application of lean thinking in construction industry.

Lauri Koskel, A well-known professor at the university of England, is the first person who drawn the creative application of lean ideas on the construction field. The lean thinking in architecture, which is the market-oriented shows that the construction

Yihong Wang, 2274420065@qq.com, Haiyang Gao, School of Management, Tianjin university of technology, Tianjin, 300380, China.
management, production management combine with the industry characteristics of the construction project, which is based on the whole life cycle of construction project, eliminating waste reduction and loss. Except from avoiding waste, it meets customers’ demand for the fundamental goal.

CONSTRUCTION CHARACTERISTICS AND MANAGEMENT PROBLEMS OF RAILWAY CONSTRUCTION IN THE NEW ERA.

The characteristics of kezhan construction in the new era

POSITIONING CHARACTERISTICS.

The railway line is transmitting from the passenger transport service and the passenger train of the operation center to the development of the urban integrated transport hub and the modern passenger center. And the change of positioning also endows the kezhan in design and construction a lot of new features.

DESIGN STAGE CHARACTERISTICS.

In the new period, the design has made great changes just as the table follows:

THE CHARACTERISTICS OF THE CONSTRUCTION STAGE

As a large public building, there is a big difference between the construction stage and the ordinary building. At the same time, the high-quality, large-scale and rapid challenges of railway stations have brought unique characteristics to the construction process.

<table>
<thead>
<tr>
<th>Category</th>
<th>Characteristic</th>
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<tbody>
<tr>
<td><strong>Functional needs.</strong></td>
<td>Transport transit center, business activity center, city image landmark,</td>
</tr>
<tr>
<td></td>
<td>integrated transportation hub, economic center and so on.</td>
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<tr>
<td><strong>Economic role.</strong></td>
<td>Realize their economic benefits, drive regional economic development.</td>
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<tr>
<td><strong>A combination of culture.</strong></td>
<td>Embody the regional characteristics, the characteristics of humanistic,</td>
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<td></td>
<td>characteristics of the times, and the characteristics of traffic architecture.</td>
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<tr>
<td><strong>Appearance design.</strong></td>
<td>Combined with Chinese characteristics and modern architectural elements.</td>
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<td><strong>Long-term development.</strong></td>
<td>Focus on environmental protection and sustainable development, the realization</td>
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<td>of a hundred years of immortality.</td>
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</table>
TABLE 2. The Characteristics of Construction Phase.

<table>
<thead>
<tr>
<th>Category</th>
<th>Characteristic</th>
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<tbody>
<tr>
<td>Resource characteristics.</td>
<td>There is a serious shortage of human resources, the shortage of funds, and the strength of material demand.</td>
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<td>Progress features.</td>
<td>The construction period is short, and the progress is ahead of schedule.</td>
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<tr>
<td>Quality characteristics.</td>
<td>Quality standards continue to improve, to pay attention to detail quality at the same time, requirements for a long time.</td>
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</table>

Construction management problem

IT IS DIFFICULT TO COORDINATE THE CONSTRUCTION OF THE PEOPLE.

The construction of railway construction is not only involved in many people, but also related to the national interested parties, local railway Bureau, municipal interface, transportation interface, passenger interface, supplier, design unit and construction unit. Supervision and other interested parties should meet the needs of various aspects, coordinate the progress of each aspect, and achieve the goal of construction. But it is difficult to coordinate all respects of the construction.

THE OVERALL INTEGRATION OF THE CONSTRUCTION PROCESS IS DIFFICULT.

The construction process of railway construction is different from ordinary construction, which involves various stages of decision-making, design, construction, operation and evaluation. At the same time, each stage has different characteristics, and the various stages are closely related to other phases and the whole body. So the integration of the construction process is more difficult.

THE CONSTRUCTION OF A WIDE RANGE OF MANAGEMENT IS DIFFICULT.

The construction of railway construction involves a wide range of elements, involving objectives, quality, progress, resources, investment, safety, technology, environmental protection, procurement, risk, and the overall factors. At the same time, all elements are involved in the quality and completion of the construction results, so the management is more difficult.

THE CONSTRUCTION OF THE RAILWAY STATION IS A BREAKTHROUGH IN THINKING

The construction concept of railway construction is a breakthrough

THE CONCEPT OF LEAN CONSTRUCTION OF RAILWAY LINE.

As the general project management barrier, it combines with the new era railway construction characteristics, analyzing the problem of management, the applicability
of a variety of advanced theories, and create the theoretical integration of lean thinking, traditional project management, process management, etc. Finally forming the concept of guiding the construction of railway construction industry.

THE CONCEPT MODEL OF LEAN CONSTRUCTION OF RAILWAY LINE.

As shown above, the principle of lean construction of railway kezhan is to realize lean management from the aspects of team, process and factor, and pay more attention to detail, optimize and refine. At the same time, it focuses on the overall control, the team, the process, the elements as a whole, which has a large degree to enhance the internal link flow and the overall integration. Thus, it achieves effective control.

A breakthrough in the construction of railway construction industry.

FUSION THE WHOLE TEAM CLOSELY.

(1) Break the barrier of communication and eliminate the waste of coordination.
The lean thinking is integrated into the management of team members. First of all, the relevant tools will strengthen the focus on the attention of the people. Meanwhile, it grasps the breakthrough of the relationship between the parties, and lay the foundation for the communication. At the same time, the communication method is improved, using diversified communication methods, breaking the communication barrier, and finally forming the support circle, and eliminating the waste of project command and the coordination of the people.

(2) Reduce the conflict of ideas, and realize the team consensus.
At present, it will manage the whole team as a whole, through effective communication on the whole team overall construction target, reduce the district construction, achieve team unity, and make team members fully understand the significance and the respective role of action, thereby eliminating conflict within the team, enhance the team cohesion and the implementation team consensus.

LINKED TO THE WHOLE PROCESS CLOSELY

(1) Eliminate waste in each link and avoid delay of process connection
Under the guidance of lean thinking, use analysis system, industry method, such as the mark to identify each link in the aspect of time, space, personnel, material waste, and take corresponding measures, strive for excellence in every stage, eliminate waste, and improve process to connect the smooth general characteristic.

(2) Reasonable planning, adjustment timely, reduce schedule delay
Under the guidance of lean thinking, strengthening the planning in the early stage, divided the tasks involved in the whole process. Meanwhile, adjust the change of emergency situation in time to reduce the delay.

(3) Effective match, reasonable arrangement, avoid personnel waste
Under the guidance of lean thinking, according to the existing human resources situation, the ability of personnel and the qualifications of the staff will be matched to the reasonable positions and tasks to give full play to the ability of personnel. At the same time, through the reasonable arrangement, realize multi-task crossing, avoid personnel waste.
CONTROL THE ELEMENTS EFFECTIVELY

1) Optimize the relevant factors and reduce the construction losses

Traditional architectural project references in the overall project management, not completely suitable for the construction of the railway station, the shortage of the adaptability which will cause losses in construction.

Finally, there are 13 major elements of target range, quality, progress, investment, safety, cost, technological innovation, environmental protection, procurement, human resources, risk, and stakeholder and integration management.

2) Strengthen key elements control and eliminate waste of construction and operations

Aiming at the particularity of railway station, the key control of six major elements on schedule, quality, investment, safety, cost, technology innovation, using the method of project management related, such as quality, cost, milestones, tools to control of the achievements of innovation, constantly optimized, fewer problems, reduce rework, thereby eliminating the construction waste in operation, to achieve excellence.

Breakthrough of railway station construction

In the process of the construction of Shanghai Hongqiao station, applied the idea of lean thinking, in terms of the stakeholder coordination, maximum coordinate each stakeholder needs, and make stakeholders to reach a consensus, promote district completed successfully. At the same time, use the relevant control tools such as quality gate and milestones to carry out reasonable control and realize the excellence.

THE PROSPECT OF LEAN CONSTRUCTION OF RAILWAY STATION

China railway station construction faces the opportunity and challenge of "going out". We need to continuously excavate the connotation of lean construction and keep improving. Under the develop of the premise of the existing construction idea, it also need to learn advanced knowledge of the theory to enrich the railway station construction concept to realize the long-term development of Chinese railway station.
REFERENCES