

## ORIGINAL RESEARCH ARTICLE

# Project Management

Wanqing Song,Chenyang Zhang,Siyao Qin

School of Economics and Management, Qinhuangdao University, Hebei, China

## ABSTRACT

Construction project management is a complicated process. The essential factors for the survival and development of construction enterprises includes focus on construction project management, improve project quality, ensure project progress, reduce project cost and improve economic efficiency. The construction market is fully open and the market competition is more intense, so the construction enterprises should establish the cost, progress, quality of the system management concept, then systemized the enterprise cost, progress and quality management work as a project and emphasize the overall. The cost, progress, quality management of the object, content, methods of analysis and research in order to achieve management innovation under an environment with safety, quality and duration of the case. Strictly control the cost of the project to minimize the project cost and create an invincible position in the market competition.

**KEYWORDS:** Project management, cost management, schedule management, quality management,

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\***Correspondence to:** Siyao Qin, School of Economics and Management, Qinhuangdao University, Hebei, China. siyaosiyao@163.com

## 1. Introduction

With the development of science and technology, people has higher requirements on all aspects of management. The same goes to the civil industry where they are emphasizing on how to reasonably arrange the construction personnel, achieve 'Everyone has something to do, everything is done', how to do site construction management, quality management, cost management in order to complete that the project in the shortest time with reasonable and effective quality. In addition, by facing the challenges of knowledge-based economy, in order to improve the level of civil engineering management, we have to pay attention to science and technology, use the latest scientific and technological achievements, improve the scientific management of the project through self-reliance on the basis of the introduction, absorption, digestion and innovation to maintain technological superiority and eventually achieve modernization of project management.

## 2. The problems in project cost management

(A) Did not form a perfect combination of responsibility and the cost management system.

All management activities should establish a combination of responsibility with management system to achieve results while it should also include cost management. The project manager in the cost management system enjoys the supreme power and is responsible for the cost management and project benefits to the construction enterprise (the chief manager or chairman) while the other business department supervisors and the managers of the departments should have corresponding responsibilities, power and distribution of benefits supporting the management system to be bound and incentives. However, the current construction project cost management system does not have a good combination of the rights, responsibilities and benefits. Some project managers simply attribute the responsibility for project cost management to the cost management manager and do not form a perfect cost management system. For example, a project has to rework due to quality problems, resulting in direct economic losses of more than 10 million while the result of the division of responsibilities is not clear, could not find a direct person in charge and ultimately no cause can be found and at the end the project suffered a huge loss and the responsible person has escaped the punishment. Another example is a technician from the project manager department who had put forward an economically viable construction program that can save more than 10 million in expenditure, in this case, if no reward is given, it will cause some damage

to the enthusiasm of the technical inventor and it is not conducive to the project department in future technological development, project cost management and control.

(B) Neglect the management and control of the project quality cost.

Quality cost refers to all necessary expenses incurred to ensure and improve the quality of the project, as well as economic losses due to failure to meet quality standards. 'Quality costs' are classified into four categories, which are the internal failure costs (such as rework and downtime), external failure costs (such as warranty and claims), quality control costs and quality inspection fees. Ensuring quality often leads to cost changes but cannot be confronted with quality and cost. For a long time, China's construction enterprises failed to fully understand the quality and cost of dialectical unity between the relationship, they had accustomed to emphasizing the quality of the project whereby they had lack of care on the project cost and results in a greatly improvement in engineering quality but increased in expenditure. However, the project manager department has a one-sided pursuit of economic benefits while ignoring the quality. Although the profit index may be high in individual projects but due to a low quality it may increase the additional quality costs due to failure to meet quality standards and also a bad reputation of the corporate.

(C) Neglect the management and control of the project 'cost of construction'.

'Duration cost' refers to all costs incurred in taking corresponding measures to achieve the duration target or the contract duration. The duration target is one of the three main objectives of project management, it is an important condition for the construction enterprise to complete project within the contract duration. The project has its specific duration requirements because the duration will often lead to changes in costs. China's construction enterprises have not pay enough attention to the duration of the project, especially the project manager, although there are clear requirements on the duration but the relationship between the duration and the cost of in-depth study is not enough and sometimes only complete blindly to the progress period, thus resulting in additional engineering costs.

(D) The basic work of cost management is not solid

At present, China's construction project manager department has a phenomenon of high prevalence. Within the project, those who engage in technology is only responsible for technology and quality, those who engage in engineering is only responsible for construction and engineering progress while those who engage in materials is only responsible for the procurement of materials. It seems to have clear cut on respective responsibilities and division of job, however the cost of the project management has to rely on everyone in order to manage, control and obtain benefits. If engage in technology is to ensure the quality of the project, the choice for program construction is feasible but not economical, it will certainly ensure the quality but increased the costs; if choose the material only from the point of view of product quality by choosing the high-strength, high-quality and high-priced materials, although there is no waste but the cost is not reduced.

### 3. To strengthen the project cost management countermeasures

(1) Establish and improve the project cost accounting system.

The establishment of project manager responsibility system and project cost accounting system is the key for the implementation of project management, and in this 'two systems' construction, the project cost accounting system is the foundation, when it is not established, the project manager responsibility system is just a form. Project cost accounting is the basis of project cost management, if there is no cost accounting then the other cost analysis and assessment, cost control, cost planning and other work is out of the question. Enterprise management accounting department has a cost management construction and accounting functions, it should fully perform its function to find out the unexplored potential and mobilize the enthusiasm of its staff in order to let the project managers to fully understand about the irreplaceable important position of construction cost management in the project construction management. At the same time while grasping the progress and quality, we have to pay attention to construction cost accounting management to create good social and economic benefits. Centralize and unify the management and deployment of the construction cost's project manager, while the cost estimators are doing the cost of the construction project, they must be independent. Under the current cost accounting management system, the vital interests of the project cost accountants are attached to the project department, so that the cost estimator cannot get full play in the project with weakened cost management, hence reduce enthusiasm in work and restricted initiative, eventually could not cooperate effectively with the company. Therefore, the reformation of the existing cost accounting management system by unifying the commission of cost estimator by the company on the project cost with centralized management, irregular rotation, regular or irregular learning, exchange, assessment and incentive competition, so that the project cost of the vital interests and the separation of the project in order to establish a healthy and orderly construction cost management and accounting network procedures.

(2) Do a good job of cost forecasting, pre-control, earnestly fulfill the economic contract

For project cost management, we must first grasp the forecasting pre-control of project cost. After the project is signed, the company and the project department will compile the construction budget and cost plan at the same time. In addition, the construction work orders and the required machinery classes will be compiled as well. Then, according to the above data, we will compare and correct the existing local, artificial, material and mechanical market price, hence calculate the total cost of the project. After the cost of the project has been estimated, the company and the project department sign a contract. In the contract, the project cost, cost reduction rate, quality, duration, safety, civilized construction and other detailed agreement are included. Through the signing of the contract, it can ensure that the project department and the company headquarters' responsibility, right and benefit are clear, so they can consciously fulfill their duties to ensure a successful completion of the project construction.

(3) Choose and use a good service subcontractor, incentive and make use of the business operation layer

With the reformation of internal mechanisms of state-owned enterprises, enterprises gradually become streamline team and optimize the structure. In order to meet the labor needs of the project, we must choose a certain amount of labor force, select the service team with good reputation, conduct a comprehensive review of the strong team and establish some relatively stable and regular assessments of the dynamic management of qualified labor subcontractors. The company set up the tender leading group, the judges is make up by the project manager, producer, labor, quality control staff and other staff, create the tender documents, then invite two or more subcontractors to bid. According to the tender document from the tender side, their credit etc. to determine the winning team, these can the process is fair and open to put an end to the back stage operation.

It is important to strengthen the centralized management of labor funds. The project department should calculate on the workload done monthly by labor force, then summarized it for the project manager to audit and signed, then report to the construction management department. The construction management department has to double check the data, and then reported to the finance department. The financial department shall approve the amount of the service fee according to the amount stipulated in the service subcontractor. If the project does not have an economic visa, the company will not confirm it. The project department should avoid the occurrence of extra expenses such as hourly and handyman outside the subcontract. Through the management of subcontracting services, it has gradually introduce the market mechanism into the operation of the enterprise's own management team and activate the vitality of the enterprise operating layer.

(4) To control the quality of the project cost and duration of the cost

To obtain benefit from the quality of cost management, for the construction enterprises, a higher product quality is not necessary better, if it is more than a reasonable level then it is consider as over quality. Whether it is lack or excess in quality, it will results in an increase of quality costs, hence it should be adjusted through the quality of cost management. The goal of quality cost management is to achieve a minimum of four types of quality costs. The right ways include the loss of quality (Including internal and external failure losses), prevention costs and inspection costs, the use of science and advanced practical technical measures. It should ensure the quality of project and reduce the cost of project as much as possible. Project manager department cannot blindly cause the phenomenon of over-quality to improve the credibility and market competitiveness of the project, this can results in a large number of projects leave incomplete while the economic efficiency is in low passive situation.

## **4. The main problems in the project schedule management**

(A) Restrictive factors and management is not in place

During the implementation of the project, there are many factors that affect the progress. For example their own management level, the construction site environment, the labor demand situation, the impact of design changes, funding issues, material supply issues, risk issues, other construction stakeholders and so on. Engineering contractors do not have any positive and effective measures on this issue; often a single factor can cause 'resonance effect' to influence on the other factors.

If we do not have a good analysis and contingency plans beforehand, hence will cause rush when things happened. Management organizations cannot guarantee the implementation of the progress of the target, overstaffed, emphasize on relationship instead of ability can result in poor execution capacity. Project members only care about their own profits, regardless of whether the project objectives can be achieved. Lack of effective supervision, incentive, assessment mechanism, the target decomposition is not clear enough, unable to find a direct person in the case of lagging behind, blaming each other from various departments and ultimately become nothing. Because there is no clear responsibility, lack of cooperation and lack of enthusiasm of the project members, thus the progress of the target will be indifferent. It is undeniable that some of the construction enterprises are indeed having a limited management level and they work blindly for the successful bid, after obtaining the project they had overlook on the specific implementation process, resulting in the delay in progress of to achieve the goal during implementation process.

**(B) Did not grasp the relationship between progress, cost and quality**

The project progress, cost and quality are interrelated, it can be said in theory that we all know the relationship between cost and progress is to speed up the progress and eventually increase the cost. In order to rush the project, we have to spend some costs; the relationship between progress and quality is to speed up the progress but will affect the quality of the project, because people and mechanical high-intensity operations is able to change the construction conditions, these may also affect the quality. However, in real construction process, the contractors did not take the time to think about how to reach a balance in the relationship between the project progress, cost and quality. They will either re-quality or grasp the cost, or else rush the progress. In short, they had not put consideration on these three comprehensive. If the progress is lagging, the contractor will generally take the rush measures, hence it will be high cost. However, they do not want to spend too much of cost, so they can only work hard in the quality. But because of the quality cannot meet the requirement of the owners, supervision and quality inspection, it has to rework, followed by a drag in progress. This had formed a vicious cycle, where the end result is increases drag in progress and increases in cost. In the construction of the project progress control, the quality control, investment control and engineering control were listed as the three main goals. Project schedule control refers to the control activities carried out during the implementation of the project objectives, in order to make the actual progress of the project construction to be consistent with the planned progress requirements, so that the project can be completed and delivered at the scheduled time. In the construction of the project, the actual progress of the project usually cannot be achieved according to schedule progress, where there is often some deviation between actual progress and schedule progress, and sometimes there is even a considerable degree of lag. This is because the construction of the project has a large, complex, long cycle and many more features. The construction progress, regardless of subjective or objective view they are subject to many factors. This article will only discuss on how to take measures to strengthen the construction unit project progress control management and put forward some exploratory understanding and views.

## **5. To strengthen the progress of the project management strategy**

**(A) Contract measures**

Construction contract was set by the construction units which use to clarify the responsibility and act as the agreement document on the legal effect of their rights; this is the basic to implement the use of market economic system of the project. The construction unit shall complete the construction task within the duration mentioned in the construction contract, they also need to pay the construction proportion as mentioned in construction contract according to the actual construction quantity (in accordance with the design drawing and quality requirements) of the construction unit. Therefore, the contract is an important means for the construction unit to carry out the target control and it is an effective measure to ensure the smooth implementation of the target control.

**1. To determine the contract duration**

In general, the contract duration is mainly affected by the construction unit requirements of the construction period, the scale of the project schedule and the impact of the tender price. During the project bidding period, the construction unit usually does not use the fixed duration due to the urgency of the project period, they will set the duration according to their actual needs, and thus limit the duration of the bid and they will choose relatively lower price bidder. Most of the construction units will ignore the project cost and contract duration in order to achieve the successfully bid the project, causing problem in the implementation period of the project, such as due to low engineering quotations and increase request of manpower, there will be difficulty in mechanical equipment, hence restricting the progress of the project and cannot be completed within the contract duration. Therefore, it is advantageous to reduce the risk of the construction unit in the control of the progress target by requiring the scientific and reasonable construction period and allowing the tender duration to play a role in balancing the bid quotation. In the actual operation, may consider the following to win the bidding program:

(1) Set the contract duration in accordance with the relevant laws and regulations which should generally not be less than 80% of the project deadline, the construction unit can consider the project schedule and the reasonable requirements of the duration as the base content.

(2) Select the tender duration which is closest to the required duration of a number of tender units shortlisted (when the tender period is consistent with the lowest price priority).

(3) Based on the difference between the bid period and the required construction period, the bid quotation should change accordingly. The tender offer is raised proportionally with a shorter duration while the bid quotation is lowered proportionally with relatively long duration project.

(4) Compare a relatively reasonable low-cost bid after the conversion of the tender offer, which use the standard of the arithmetic average converted tender, then choose the one closest to the target value as the successful bidder.

After two comparison, those with longer bid period is not shortlisted, and for those shorter tender period, there is difficulty in getting the bid because of the raised tender price after the conversion, hence prompts the tender unit to optimize the tender price and tender duration.

## 2. The project payment to the contract control

Project schedule control and construction of the contract payment methods are inseparable. The progress of the project is not only the amount of construction units to quantify, but also to promote the operation of the project power. Project progress control must firmly grasp this key, and make sure it is mention in the contract, in order to ensure the smooth progress of the project. If in the contract, the payment of the project is by monthly measurement of the amount of work, it can be adjusted to pay by measurement of the progress image. This can separate the project into a number of stage objectives to be achieved, and make the payment according to the completion in each stage. This will not only make the progress of the project schedule payment clear, more importantly, to improve the subjective initiative of the construction unit, to take the initiative to optimize the construction organization and schedule and to avoid payment done in accordance to the workload done.

## 3. Control the contract duration

Delay of contract duration is generally due to the construction unit, engineering changes, force majeure and other reasons, while delay in the construction unit is due to poor management and other reasons, hence concept causes of delay contract duration and construction unit are different. Therefore, the contract should be clear stated the acceptable reason for delay of contract period, for example, the change in construction site conditions, construction defect and contract documents defects, changes in construction unit or the design drawings that caused temporary suspension of work, the delay construction period, the delay in supply of materials and equipment by the owners and so on. The delay causes mentioned above are the prerequisite for the extension of the contract period, but not necessarily can be approved. Beside, also need to determine whether the delay of construction schedule is in key line of the project, in order to obtain the approval of the contract duration extension. If the extension event occurs on a non-critical line and the extension time does not exceed the total time difference, for example, the changes in design of the roof waterproof layer occurs during the construction phase of the construction, then the extension of the application period cannot be approved. In addition, the approval of the contract duration extension must also be consistent with the actual situation and pay attention to timeliness. Usually it was agreed to make application and submit a detailed report to the construction unit representatives or supervision engineers within 14 days after the delay occurred, otherwise the application is invalid.

### (B) Economic measures

To promote the development of things in a favorable direction, at any time the economic levers are one of the important measures, project schedule control is no exception.

#### 1. Stressed the liability of default duration

If the construction unit wants to achieve good effect of project schedule control and achieve the construction period goal, it is necessary to highlight the construction unit's liability for breach of contract and form concrete measures. In the process of progress control, the construction unit plays a deterrent effect to the construction unit. According to the progress of the project plan, if the construction unit exceeds the planned time point and cannot complete the image of the progress, they will have of the to pay the construction unit according to the contract price of a certain proportion each day as a results of breaching of contract. The construction unit will continue to detain or accumulate the penalty for liquidated damages, and the maximum amount of liquidated damages shall not exceed 5% the total price as stipulated in the contract regulations.

#### 2. The introduction of reward and punishment incentive mechanism

For a long time, under the enormous pressure of controlling the project progress to achieve targets, there are mostly 'penalty' tactics used but the effect is not obvious. Basically, the original intention of the construction unit is to complete the project on schedule rather than 'penalty', while some construction unit rather take the 'penalty' willingly after considering the construction costs that will be used in order to rush the project to complete in time, this is because the liquidated damages limit will not exceed 5% of the total price stated in contract. This will increase the input of staff, close to material turnover costs and reduce the construction costs by delaying the construction period. Therefore, it is more passive if the progress of the project uses only the penalty approach, while by using the combination of reward and punishment approach it can guide the construction unit to become active to take the initiative. The reward for construction units that complete the project in ahead of the contract period can be agreed as a specific value or given the same of amount of money as the liquidated damages fine. As the effect of reward is greater than punishment, those construction units which are striving for brand will naturally and actively cooperate with the construction unit of the progress of control, work as much as possible for their honor, this can also contribute to the virtuous circle of cooperation between the two sides.

### 3. Organizational measures

Organizational coordination is an effective measure to achieve progress control. In order to effectively control the progress of the project, we must settle the existing problems in the work of the parties involved, establish a harmonious working relationship, and fully mobilize and exert the enthusiasm of all parties' work by clarifying the duties, rights, work assessment standards, creativity and potential.

#### (1) Highlight the focus of work and emphasizing on responsibility

For the participating units, the three control objectives of the project are equally important, but if the parties emphasize equally on the three control objectives then there will have a possibility of a trade-off problem. In practice, the ideal program is by emphasizing on the progress, the quality and the investment control as the work focus of the construction unit, the supervision unit and the construction unit, respectively, where these three units are not independent, but has to combine its main responsibility. In the case of schedule control, the main responsibility of the construction unit is to prepare and implement the construction schedule according to the contract and ensure the quality of the project under the supervision of the supervision unit. If the construction period is delayed, the construction unit and the supervision unit shall have the right to request the increase of manpower, material investment and bear the loss and responsibility.

#### (2) To strengthen the management of the construction project department

Construction unit project is main key in the implementation of the progress of project; the coordination of the project cannot be separated from the active cooperation from the project staff. Therefore, the quality of the project staff is particularly important. The construction unit shall request the personnel of the project department to be in line with the bidding documents and take the initiative to strengthen the communication with the personnel of the project department, understand the technical management level and ability, and correctly guide them to achieve the control goal consciously. Under the condition where the project has to deal with negative feeling and not actively cooperate with the situation, the on-site construction unit management personnel have the right to make comments on the adjustment in composition of the project department. At the same time, the construction unit can also supervise and inspect the management of the project department from the progress, quality, capital and other aspects.

In short, the above measures are mainly to improve the pre-control capacity, strengthen the way to achieve the purpose in accelerating the progress of construction. In the implementation of the project, must combine the passive control with active control closely. Only when we analyze carefully on the impact of various factors in the progress of the project objectives, compare the actual progress and schedule of progress, develop a correction of the deviation of the program, and take measures to adjust the actual progress and schedule to be consistent.

## 6. The main problems in the quality management of the project

#### (A) The project has a serious shortage of human resources.

In order to reduce the expensive human resources cost, in time with multiple projects, most of the construction enterprises use matrix management model with project construction personnel, professional and technical personnel flow in the frequent between projects, resulting in many projects are not equipped with full-time quality management personnel, hence the quality control of the project is difficult to achieve the desired results.

(B) Project quality planning is a mere form. In the control of the progress, cost and quality of the project, the project manager often neglects the control of the project quality, they did not develop a practical project quality plan, hence the processes and resources necessary to achieve the project quality objectives are not guaranteed.

(C) The quality of the project design is not qualified. Due to the lack of control of the design process, the design output cannot meet the design input requirements, resulting in doubling the number of project design changes, reducing the quality of the project while increasing the cost of the project.

(D) The role of project supervision needs to be improved. Due to the low cost of some project supervision, the quality and quantity of supervisors and the facilities required for supervision are difficult to guarantee, and the role of supervision is not fully realized.

(E) The quality control of the project is not strict. Since there is no reasonable set point of quality control, there is a phenomenon where part of the process out of control.

(F) Lack of quality reward and punishment measures. Due to the lack of rewards and penalties in the project control, the risk-free mechanism, no clear project cost on the quality and number, so that the construction unit over-pursuit of the progress of the project and ignoring the quality of the project.

(G) Neglect the quality of the project in later operation. The completion of the project causes the reliability, maintainability and maintenance of the project to become an important aspect of project quality. From the feasibility study to the engineering design, the protection of project should be put as an important feature to consider.

(H) Did not pay attention to cultivate mutually beneficial supplier relationship. Over press the contracted price of the contract, resulting in the use of poor management units of the construction team, so that the construction quality is difficult to maintain, product protection measures are ineffective, hence seriously affected the quality and progress of the project.

(I) The verification system of quality was not really implemented. In the implementation of the project, due to the abnormal sequence of process in construction, without quality inspection or verification of qualified procedures lead to the phenomenon of low quality incident.

## **7. Countermeasures to strengthen the project quality management**

(A) Improve quality awareness and strengthen quality education.

Improve the quality awareness of all the members (including subcontractors and cooperating units) of all participating projects, especially the quality consciousness of the project leadership team member, establish the idea of 'the hundred years plan starts from the quality first', also treat the quality of the project as the important content in assessment of project, then improve the enterprise's social credibility of competitiveness with excellent quality. The quality of the project depends on the quality of the staff to a large extent by quality education, hence should provide them the quality awareness, professional ethics, quality management knowledge and professional and technical education, which are important to ensure the quality of the project.

(B) To establish the quality responsibility system and a clear project leadership responsibilities. The quality responsibility system is to clarify the specific responsibilities and powers of each person in the quality work. The project manager is the leader and organizer of the project quality management and plays a decisive role in ensuring the quality of the project. Project leadership team members should focus on objectives of project quality management and joint their efforts to create a better quality. The members of the project leadership team, the relevant functional departments or personnel should clear about their own responsibility in order to ensure the quality of work, to do their duty and job for a better quality. In addition, after the end of the project, we have to get the feedback from users and check the changes in quality of the project. Collect the quality information timely and solve the poor quality problems accordingly, then systematically summed up the number of weakened in quality of the project in order to take appropriate countermeasures and continue to improve the quality of the project.

(C) To determine the objectives of project quality.

Quality control design in the project management should be included in the entire project, the individual projects, unit works, sub-project and even the sub-department; all these aspect should have developed clear quality objectives. Quality control design is the specific technical measures to achieve the quality target, it should clearly define each of the engineering unit, sub-projects, sub-department quality requirements and quality assurance measures through quality control design, then effectively organize all the staff to achieve the quality objectives where each employee's goal is to complete their work as targeted. An important aspect of quality control design is the rational determination of the quality control point, which includes the R point (the contractor only needs to provide a test or test record or report the project), W point (on-site witness to the contractor to participate in the inspection or test project) and the H point (Stopping time to be checked. The contractor must suspend the progress and wait for the inspection or pilot project of the contractor's supervisor represents).

(D) Implementing the national laws and regulations

Conscientiously implement the policies on quality management at the national and higher levels, implement the technical standards, norms, procedures and quality management systems issued by the state and the higher authorities, and formulate management in light of the specific situation of the project rules and process standards, carefully organize the implementation at the same time of use of the quality of management ideas and methods, the implementation of the objectives and objectives of management, to determine the project quality management objectives. According to the importance of the project and the operation level that can be achieved by the project, determine the quality level (excellent or qualified), then expand the plan, slowly decompose the task of achieving the quality goal, and implement it in the relevant departments and personal. To focus on the project quality objectives, according to the quality of weak links, determine the quality management point, in accordance with the management point then form various quality management teams to carry out massive quality management activities. By using of the PDCA cycle to improve the quality of the project level continuously, it can develop rules and regulations for each project management approach, it can become a basis of all employees to participate in the activities and to avoid the unclear responsibility.

(E) Pay attention to quality information and establish two systems.

Quality information is referring to the quality of the project and basic data and the situation in the management of process. During the implementation of project, we have to keep abreast of the construction unit, design units, information of quality supervision departments and grasp various quality information timely then record it down, establish a highly sensitive information feedback system, the provisions of a variety of quality information transmission procedures, timely control the dynamic of project quality, so that the project manager and the relevant personnel can make corresponding countermeasures in a timely manner.

(F) Control the quality of subcontracting.

The general contracting unit that responsible for the project quality inspection also has the responsibility to supervise and help the subcontractors to improve the quality of the project. When selecting the subcontracting unit, it is necessary to investigate the technical capacity and construction quality of the unit.

## 8. Conclusions

All in all, with the continuous development of market economy, it has formed a phenomenon where the bidding for construction projects as the main feature of the construction market; the industry market competition is reflected in the cost of competition. To improve market competitiveness of construction enterprises, the most important thing is to reduce the incident which by using minimal physical, chemical consumption and labor consumption to reduce business costs in the construction project. It is important to produce a good quality and duration control. Control the expenses that affect the cost of project within the planned scope, do well in the project management, in order to achieve the best interests of enterprises.

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