

Increasing Performance in the Japanese Construction Industry

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The performance of the construction industry in Japan has been high due to a lack of emphasis of price. Due to rapid change in the industry environment such as social requirement of fair implementation process of public works; however, there is a deep concern that the performance of the industry is being lowered due to more emphasis on the public works getting the low price contractor. Many efforts are being made to keep its high performance in a more cost competitive environment. A comparison between the essence of public bidding reforms in Japan and principles of the Best Value Approach shows some ideas on the future of the public bidding scheme. The critical areas needing to be addressed are the importance of various levels of feedback loops in social capital management and clarification of the position of supervision for appropriate risk sharing between the public client and the vendor. Additionally, in order for local governments with insufficient engineering resources to be truly accountable, it is worthwhile studying an alternative evaluation method of proposal and performance including non-technical one.

Keywords: best value approach, comprehensive evaluation method, construction industry performance, Japan, public bidding.

Introduction

Recently, the construction industry in Japan has undergone major turning points. It is often said that the performance of the industry has been high but its price competitiveness has been low. Due to rapid change of the industry environment such as social requirement of fair implementation process of public works, there is a deep concern that the performance of the industry is being lowered (Review Committee of Comprehensive Evaluation Method for Public Works, 2005). Many efforts are being made to keep its high performance through enhancing its competitiveness.

To realize continuous improvement, it is always useful to study and share theory and practice in other countries. The design and operation of the public bidding system in Japan is not exceptional. To discuss what should be strengthened in public bidding reform, this paper focuses on the “Best Value Approach” advocated by Kashiwagi (2010) as a reference of theory and practice in other countries. Since this approach incorporates feeling of “site people” and has

much similarity to Japanese schemes and culture, the authors propose that it may result in reasonable and realistic solution.

The objective of this paper is, thus, to 1) explain characteristics of the conventional Japanese public bidding schemes, 2) overview the reform history of public bidding schemes and the comprehensive evaluation method (CEM), which is to appraise price, technical proposal, and past performance of each bidder, 3) compare the Japanese public bidding reforms with the Best Value Approach, and 4) identify possible areas to be strengthened to achieve the high performance through high competition in the construction industry in Japan which may also be applicable to other countries.

Conventional Public Bidding Scheme

In Japan, The Act of Public Account was enacted in 1889, which stipulated that open competitive bidding was the bidding scheme to be used (Kunishima & Shoji 1994). The Act emphasized price competition by using detailed minimum specifications, and many public projects resulted in poor quality (Takeda 1994). This can be referred to as the low bid paradigm (Kashiwagi 2010). In order to deal with this problem, the Act of Public Account was amended to introduce designated competitive bidding in 1921, which has been used as a main bidding scheme for more than 90 years.

Designation, “dango,” and the ceiling price are characterizing factors of the conventional Japanese public bidding systems (Kanemoto 1993), particularly since the period of high economic growth in Japan in the late 1950s. Dango is a complementary and rotational bidding system. In this system, the client first prequalifies and designates trustworthy companies. These designated companies discuss and determine the winner for the project. In some cases the client takes the initiative and authorizes the winner. The ceiling price is the budget for the client. This price becomes the strict upper limit on the awarded price.

Rotation and distribution of works had been determined fairly among contractors or by the public client. This rotation and distribution was determined “comprehensively,” that is, based on volume of works each in hand, expertise, location of each bidder, and so on. When dango was led by contractors, the dango leader had to be fair (Social Unit at Kyodo News Service 1994). Since the upper limit on contract value is the ceiling price set by the public client, excessive increase in contract value is controlled. These are reasons that dango had lasted for so many years.

This scheme has the following characteristics. First, quality is emphasized and ensured. This follows the Japanese culture and tradition of pride and accountability. Once the extremely poor work is founded by the client, that vendor would never be designated and used again. Second, transaction activities and costs, particularly the contract monitoring costs and contract enforcement costs are minimized (Watanabe 2007). The Dango system does not use owner/buyer management, direction and control of the vendor to ensure quality. The system depends on the expert contractor delivering the highest quality. The Dango system resulted in smooth implementation of many projects with good quality. Since the emphasis on price competitiveness

is low, however, the Japanese construction industry in the conventional scheme is classified in Quadrant III in the Construction Industry Structure, as seen in Figure 1.

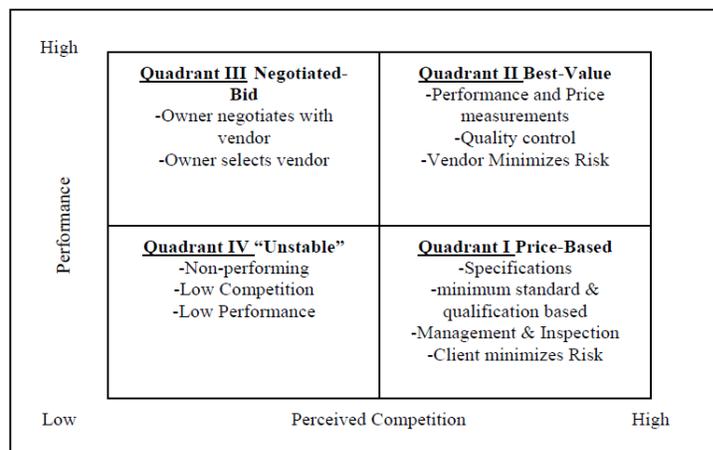


Figure 1. The Construction Industry Structure (Kashiwagi 2011)

The Dango system is difficult to defend in a public governmental environment where minimum standards and low price is the norm. Since the downturn of public investment the emphasis on price has increased. Many cases are observed in which dango system influence led to some undesirable results. In 1993, one governor and two mayors were arrested for bribery in public biddings. Contractors who desperately wanted projects bribed these politicians and asked them to give “the voice from the heaven” to the other bidders so that they would give up competing. Since then, many dango incidents have been reported. In public bidding during the downsizing economy, dango became much less successful in Japan. The development of an alternative method to dango is needed in which all bidders accept the process and the result of the selection.

Reforms of Public Bidding in Japan

The Japanese government has been making reforms of public bidding. The immediate objective was to enhance perceived fairness of the procedure by improving transparency. In 1993, the Central Council on Construction Contracting Business worked out the proposal named “Reform of the Bidding and Contracting Procedures for Public Works”. In this reform, introduction of the general competitive bidding scheme was determined (Kunishima & Shoji 1994).

As the designated competitive bidding was replacing the general competitive bidding, however, there was an anxiety and fear that quality of construction works may not be ensured in future. There was a great risk that the Japanese construction industry would fall down into Quadrant I from Quadrant III. In 2005, “The act for ensuring the quality of public works” was enacted, which clarifies fundamental principles and responsibilities of the public client of ensuring quality of public works. The act also states replacement of “competition solely through price” with “comprehensively superior procurement based on price and quality.” Here the CEM (Comprehensive Evaluation Method) becomes a key component to procure good quality service with fair and competitive procedure (MLIT 2009).

Other Key Components

In addition to the CEM, other key components are refined and developed. The project performance evaluation and Construction Records Information System (CORINS) are representative components.

Table 1 shows a prototype of project performance evaluation sheet used by the Ministry of Land, Infrastructure, Transport, and Tourism (MLIT) (2008). Scores associated with evaluation of “d” and “e” are very low and function to prevent execution of extremely poor works.

Table 1

A prototype of project performance evaluation sheet

Inspection item		Chief technical evaluation officer					Overall technical evaluation officer					Technical inspector				
Item	Sub Item	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e
Organization	General		1.5	0	-5.0	-10										
	Project Engineer	3.0	1.5	0	-5.0	-10										
Construction situation	Constr. control		1.5	0	-5.0	-10						5	2.5	0	-7.5	-15
	Delivery control	1.0	0.5	0	-5.0	-10	10	5	0	-7.5	-15					
	Safety management	2.0	1.0	0	-5.0	-10	15	7.5	0	-7.5	-15					
	Public relations	2.0	1.0	0	-2.5	-5										
Completed part and workmanship	Completed part	2.0	1.0	0	-2.5	-5						10	5.0	0	-10	-20
	Quality	2.0	1.0	0	-2.5	-5						15	7.5	0	-12.5	-25
	Workmanship											5	2.5	0	-5	
Advanced technology	Advanced technology	(13) ¹⁾		0												
Originality & ingenuity	Originality & ingenuity	(7) ¹⁾		0												
Sociality	Regional contribution						10	5	0							
SUM (=1+2+3+4+5+6)																
Total score (=65+SUM)																

Note: Only excellent items are evaluated

The other component is CORINS developed by the Japan Association of Construction Information Center (JACIC). This puts the construction record of the public works, which contractors register as “construction records” into the database, and provides it with public organizations. Registration of public works was started in March 1994 for those contracts of more than 50 million JPY and was extended to more than 5 million JPY in fiscal year (FY) 2002. As of the end of March 2012, the number of contractors registered was about 138,000 in total and the number of registered completion construction projects was approximately 3,703,000 in total. This database has been in great use (JACIC 2012).

Introduction of the CEM

The CEM has been continuously revised based on results of careful monitoring (Ozawa 2012). The social environment of the CEM is changing. Vendors' strategies to the CEM are also changing. Evaluation items and weights associated with each item are changed in a timely manner based on thorough analysis of results of the CEM.

The CEM in Japan was first applied to two public projects ordered by the former Ministry of Construction in FY 1999. The original objectives of the CEM are to utilize the advanced technology of the private sector, improve the value for money of public investment, and increase the social benefits.

Since application of this type of the CEM needs much preparation; however, introduction and utilization of the CEM was very much limited. Thus, "The evaluation method of the performance in the CEM regarding the bidding on construction work" was established in 2002. This method sets the ceiling price at the price of a standard construction method, and giving 100 points as the standard points and 10 points as the additional points. This type of the CEM is positioned as "the standard type CEM." With this direction, the workload of preparation for the CEM was greatly reduced.

In "The Act of Promoting Quality Assurance" enacted in 2005, the role of the CEM was changed to ensure the quality of public works. Thus, it was required to apply the CEM to projects with small room for technical ingenuity that were ordered by the national and local governments. Here, "The Simple Type" was introduced to comprehensively evaluate the price and the technical capability to ensure the quality of a project with a standard method developed by the client. In addition, "The Proposal of the Advanced Technology Type" was also introduced to solicit advanced technologies, which may bring necessary changes in the final product. With "The Simple Type," "The Proposal of the Advanced Technology Type," and "The Standard Type," the CEM can apply to any project with varying characteristics such as type of work, scale, and requirement conditions, etc. Now the CEM is applied to more than 99% of projects ordered by the MLIT (MLIT 2009).

The following is an example of the contents of technical points in the simple type CEM:

1. Simple execution plan: Items which should be considered to perform the execution
2. Execution achievements of companies
 - a. Executions of identical or similar work during the past 10 years
 - b. Average evaluation scores of work performed during the past 2 years
 - c. Awards for superior work received during the past 2 years?
3. Capabilities of technologists who will be assigned
 - a. Executions of identical or similar work during past 10 years
 - b. Average evaluation scores of work performed during past 2 years
4. Company's contribution to the region: Activities performed based on a disaster agreement during the past five years?

From the second half of fiscal year 2005, price competition became very severe. Extremely low bids frequently occurred, and concern of quality deterioration due to poor works has further risen. Thus, “On Emergency Measures to Ensure Quality of Public Works” was summarized in December 2006. As the key measure, the further additional points of evaluating construction systems were introduced. This scheme is called “Verifying Construction Systems Type.” Furthermore, during the recession of FY 2008, economic measures and early execution of the supplementary budget were required to take action. To deal with this situation, an even simpler CEM than “The Simple Type” was applied by emphasizing the past performance of each bidder and skipping submission of a concise construction plan and the interview with engineers (MLIT 2009).

Effects of the CEM

Table 2 shows how much the CEM has been applied to the projects ordered by the MLIT and the average of the project performance score (MLIT 2011a). The average scores steadily increased as the CEM is applied to more projects. If scores greater than or equal to 75 are considered high, the average quality level of all projects has been increasing.

Table 2

Application and effects of the CEM in projects ordered by the MLIT

Fiscal Year	The number of applied projects	The ratio of applied projects (%)	Average of Project Performance Score
2005	8,146	16.9	73.2
2006	7,996	76.2	73.7
2007	11,248	97.1	74.2
2008	10,068	98.8	75.0
2009	9,300	99.2	75.6
2010	3,879	99.2	75.5

Note: Evaluation method was modified in FY 2010

To further study the effects of the CEM, a questionnaire survey was conducted by the MLIT in between October 18, 2010 and November 12, 2010. Respondents to this survey were 10 Regional Development Bureaus of the MLIT, 66 local governments, 47 Prefectures, 19 ordinance-designated cities, 414 construction companies, and 716 ordinary people through WEB questionnaires. Two main questions were asked: a) what effect has already appeared or is expected to appear in the future and b) requests for improvement of the CEM. Since similar surveys were conducted in 2006, comparison was made to the previous survey. Summary of the results are given in Tables 3 and 4 (MLIT 2011b).

Both the client and construction company feel that the CEM is effective in “Decrease in nonconforming works,” “Promotion of competition,” and “Prevention of dango.” Both parties also feel that there is still a room for improvement in the method of evaluating and reviewing technical proposals. As compared with the previous survey, except for the item of “Evaluation and review of technical proposals” a smaller ratio of people have improvement request. All related parties have been working hard to improve the CEM. However, there is still a need for improvement. Particularly, simplifying the procedure of evaluating and reviewing technical

proposals is still a formidable task. To respond to this request, a major reform is now discussed and implemented.

Table 3

What effect has already appeared or is expected to appear in future

	MLIT	Local Government	Construction Company	From previous survey
1. Decrease in nonconforming works	✓	✓	✓	up
a. Decrease in the # of accidents				--
b. Completion on time				--
c. Improvement of work performance	✓	✓	✓	--
d. Establishment of quality management systems by the company	✓	✓	✓	--
2. Fairness and Transparency	✓	✓		no change
3. Promotion of competition	✓	✓	✓	down
4. Prevention of dango	✓	✓	✓	no change
5. Expansion of opportunities for participation				no change
6. Improvement of accountability	✓	✓		up
7. Improvement of familiarity with the field		✓		down
8. Utilization of new technology				up
Note 1) ✓ is put in the item where more than half of respondents answer "yes."				
Note 2) "—" means that question was not asked in the previous survey.				

Table 4

Improvement request for of the CEM from each party

	MLIT	Local Government	Construction Company	From previous survey
1. Time and cost associated with proceeding the procedure	✓	✓		down
2. Evaluation and review of technical proposals	✓	✓	✓	up
3. Disclosure of the evaluation results			✓	down
4. Cost of developing technical proposals				down
5. Effects preventing low bid		✓	✓	down
6. Consistency between technical proposal and the ceiling price			✓	down
7. Expansion of awarded opportunities for local companies		✓	✓	down
Note: ✓ is put in the item where more than half of respondents answer "yes."				

Comparison between the Japanese Reforms with the Best Value Approach

Representative principles of the Best Value Approach developed by Kashiwagi are a) Paradigm shift, b) Client should be less accountable and hold expert vendor accountable to identify scope, c) Client should be accountable for delivering high performance services by using expertise rather than direction and control of vendors, d) Utilization of past performance information to show project capability, e) Expert vendors have no risk, but are motivated to identify and mitigate, while clients have financial accountability for risk, f) Importance of clarification period from when vendor clarifies her/his proposal and identifies and has a risk mitigation plan for risk to when the client can accept the proposal, g) Nontechnical evaluation of dominant information.

Reforms of Japanese public bidding possess many of the above characteristics of the Best Value Approach. The followings are overall comparison of the two approaches.

Strength of the Scheme in Japan from the Viewpoints of the Best Value Approach

The notion of “Client should be accountable for delivering high performance services” is now widely understood in the construction industry in Japan. A research team was established in 2000 to study how to define the client responsibility and how to fulfill it in infrastructure development and management (Japan Construction Engineers’ Association 2000). This responsibility is defined as “the responsibility of procuring and providing services or goods with good quality in a timely manner at inexpensive price.”

Most of the public clients and the private companies have no resistance against using the past performance information. Designation, which has been a key in the designated competitive bidding process, has been made based on the past performance. After the general competitive bidding was introduced instead of the designated one, CORINS was developed. It is now widely used by both the clients and the private companies and become one of the most successful business models in the construction IT systems. The project performance score also plays a vital role in selecting high performers and supporting the CEM.

Actually the Japanese government is developing and implementing three levels of feedback loops in social capital management in a transparent manner. Minor cycle is the mechanism, which can ensure achievement of high quality products from each work. Intermediate cycle is a mechanism, which appropriately reflects the past performance of a vendor in the next vendor selection. Major cycle is the mechanism by which experience at each stage of the project life cycle is steadily handed over to its subsequent stage throughout the whole construction production systems and fed back to its upper stream stage. These types of feedback mechanisms are considered essential to keep the performance of construction industry in not only Japan but also other countries.

“Motivating the vendor to identify and minimize risk” has been commonly practiced in Japan under the notion of “responsible construction”. For example, to construct facility truly suitable to the site conditions, it had not been uncommon for a vendor to voluntarily make a minor modification of the design document and execute it. High performing vendors had been willing to take risk and assist the client.

Importance of the clarification period is now well discussed. Three parties discussion is recently introduced among the client, consultant, and contractor. To ensure quality, an attempt is made to focus on quality management of each construction process more carefully.

The principle of nontechnical evaluation seems the only major difference between the reform direction headed by the MLIT and the best value approach. The technical evaluation has been possible with high quality in-house engineers and much richer human resources than most of other public client organizations.

Weakness in the Japanese Scheme

However, there is a big concern. In many projects bids concentrate around “the lower limit,” and the bid competition substantially becomes price competition. It is becoming more difficult to take a proper balance between the price and non-price part.

Local governments face more risky situations of falling in the low bid paradigm than the MLIT. First, the local government has more direct pressure to be “fair” and “cost efficient” procurement from the local residence. Second, local governments with an insufficient number of engineers are feeling a big hurdle and giving up in introducing the CEM and the evaluation of project performance score, which are practiced by the MLIT. As a result, in more projects, multiple bidders bid at the lower limit and the awarded vendor is determined by tossing a coin. Acceptance of this selection process shows a possibility that governmental officers fall into believing the low bid paradigm.

A fundamental reason for the high risk of local governments to fall into the low bid paradigm is the way construction plan or technical proposal is evaluated in the current CEM. The current evaluation practice of clients forces vendors to increase the promised scope to get the job. This increases the risk and lowers the performance. The current practice also forces the client selection committee to be the expert.

Contractors want to know why they were not selected, and when this is based on the selection committee’s bias, no one wants to have full transparency for fear of exposing biased decision making. This therefore forces low bidding practices when the system is supposed to be price and quality and increased quality.

The consequent risk to falling into the low bid paradigm is prevalence of the vice circle that existence of poor performers creates poor quality work, which leads to survival of poor performers. Ninomiya (2011) develops and runs a simulation model to represent the survival situation of local companies when the contract awarder is kept determined by tossing a coin. The simulation results hint at a possibility that high performers would be out of business due to hard luck in the long run. These phenomena are also observed in many other countries.

If poorer performers start executing public projects, ambiguous position of supervising scheme in Japan could be a big factor to induce the second risk of the vice circle. The “Guide for performance evaluation, inspection and supervision to ensure the quality of public works” (MLIT, 2008) states that “The supervisor should not give unnecessary guidance to blur responsibility sharing between the client and vendor or make unnecessary confirmation to lead to cost increase.” This inappropriate supervising and risk sharing gives a room for survival of poor performers.

Possible Areas to be Strengthened

First, inappropriate risk sharing should be avoided through clarifying the position of supervision. Though there is a view that supervision is not needed anymore, its functions of directing design document changes and technical judgment on contract alterations are indispensable in site management. Careful discussion is desirable about the future of the supervising scheme.

Second, it is worthwhile studying how feasible and accountable nontechnical evaluation of proposal and performance of each vendor would be. Actually, the MLIT has ordered one social experimental project to which nontechnical evaluations was applied. In this CEM project, selected bidders' presentations were non-technically evaluated by residential people, and their evaluation results were incorporated into the technical score of each proposal (Kurauchi 2011). In this case the best proposal selected by the client and the residential people happened to be the same. In order for the public client in local governments to be truly accountable, alternative method of proposal and performance evaluation including nontechnical one should be seriously studied.

Conclusions and Recommendations

Comparison between essences of public bidding reforms in Japan and principles of the Best Value Approach shows some ideas on the future of the public bidding scheme. One of Japan's strength, various levels of feedback loops in social capital management, is considered essential in maintaining and improving the performance of construction industry. The position of supervision should be clarified to always realize appropriate risk sharing between the public client and the vendor. In order for local governments with insufficient engineering resources to be truly accountable, it is worthwhile studying alternative evaluation method of proposal and performance including non-technical one.

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