A Study on the Improvement of Contract Information Management in Korea's Public Construction Technology Service

Kim Namgon and Kim Seong Jin
Korea Institute of Civil Engineering and Building Technology, Goyand-si, Republic of Korea

Keywords: Principal Contract, Construction Technology Service, Service Results, Duplication of Engineers' Work.

Abstract: To integrate the management of construction technology service results under principal contracts in the public sector, this study sought to prepare a system that would enable the integrated management of service results – which are managed by public agency, construction area, and project area – and to present the improvement measures for the process of managing service results according to the users, such as ordering agencies and service firms. Moreover, based on the improved process, a prototype system for the management of construction technology service results was developed to register, review, and approve the service results information among the responsible service staff and the working staff of public agencies. As a result, the system enables all engineers engaging in construction technology services to check if work is duplicated, and to confirm the service firms' performance results, thus making this study useful for the selection of appropriate service firms.

1 INTRODUCTION

In South Korea, the service area of construction engineering was separated from the construction services in an initial effort to promote and foster the professionalism of various businesses, but with the passage of time, the construction services were increasingly divided into various areas, resulting in a divided service structure. Due to this complicated service structure, a variety of licenses in diverse individual areas, such as design, construction project management, and supervision, have to be acquired, leading to the separate management of construction information between service areas, and consequently making it difficult to grasp the service results information by service firm at a glance(SuZin Chang,2004).

Thus, there is an emerging need to improve the operational resilience of the construction engineering industry, to shed the division of service areas with a view to promoting and advancing high-value-added industries, and to thus integrate service areas(KyongHo Jin, 2012).

As part of such advancement measures for construction engineering, this study sought to construct a system designed to integrate the management of construction technology service results in design, supervision, and CM.

2 IMPROVEMENT MEASURES FOR THE MANAGEMENT OF SERVICE PERFORMANCE RESULTS

2.1 Overview of the Management of Public Construction Technology Service Results

The construction industry is classified into the construction work and the construction technology service. Of the two, for the management of the construction work category, KISCON manages the construction work results information after starting & ending the construct work(KyuSung Lee, 2013).

Researches on the management of construction service performance results, however, are relatively lacking. Thus, as public agencies manage service results information individually, it is difficult to match service results data, and it requires much time to verify the duplication of the results of services rendered by other public agencies.

Namgon K. and Seong Jin K..
A Study on the Improvement of Contract Information Management in Korea's Public Construction Technology Service.
DOI: 10.5220/0005155403870392
In *Proceedings of the International Conference on Knowledge Management and Information Sharing* (KMIS-2014), pages 387-392
ISBN: 978-989-758-050-5

To resolve these problems, a need to systematically manage the construction technology services was raised. To achieve the real-time confirmation of the results of services rendered by public agencies for other public agencies, whether the employment of engineers' participation is duplicated, etc., this study sought to present standardized performance information management items and management procedures.

2.2 Service Performance Information Management Items

The types of construction technology services include the formulation of a construction-work-related plan, survey, design, design supervision, construction execution, and safety inspection; facility maintenance, repair, demolition, management, and operation; construction-work-related test, evaluation, consultation and guidance; construction supervision; and construction project management(ChulJong Yoo, 2011). These construction technology services are classified into design, supervision, and CM, and individual services are again segmented according to the project stage. Likewise, project stages are classified into design transfer, basic design, execution design, purchase and procurement, construction execution, and follow-up management.

The construction technology service classification system shown in the below table features information items derived from relevant specialist groups. The first specialist group was made up of one expert in each of the road, river, and other service areas, and they were requested to extract service information items by category. The above final service information items were derived after the second expert group, made up of service-related officials in public agencies and service firms by category, reviewed and complemented them through a number of meetings.

Table 1: Classification system for road construction technology services.

Category	Project stages	Detailed areas
Design	planning	Feasibility investigation, basic survey, basic plan, strategic evaluation of environmental impact, evaluation of traffic impact, follow-up evaluation, prior assessment of disaster impacts, surveying, measurement, etc.
	Basic design	Basic design, evaluation of environmental impact, small-scale evaluation of environmental impact, evaluation of traffic impact, follow-up evaluation, design supervision, design VE, prior assessment of disaster impacts, ground survey, surveying, measurement, etc.
	Executed design	Execution design, design Value Evaluation(VE), evaluation of environmental impact, small-scale evaluation of environmental impact, evaluation of traffic impact, follow-up evaluation, evaluation of disaster impact, ground survey, surveying, measurement, etc.
	Construction	Design VE, test and evaluation, follow-up survey of environmental impact, follow-up evaluation, ground survey, quality management, safety inspection and diagnosis, surveying, measurement, etc.
	Maintenance management	Design VE, test and evaluation, follow-up survey of environmental impact, safety inspection and diagnosis, ground survey, maintenance and repair, etc.
Construction Management	Planning	
	Basic design	
	Execution design	
	Purchase and procurement	
	Construction	Acting supervision rights (mandatory, part, voluntary), etc.
	Maintenance management	Maintenance and repair

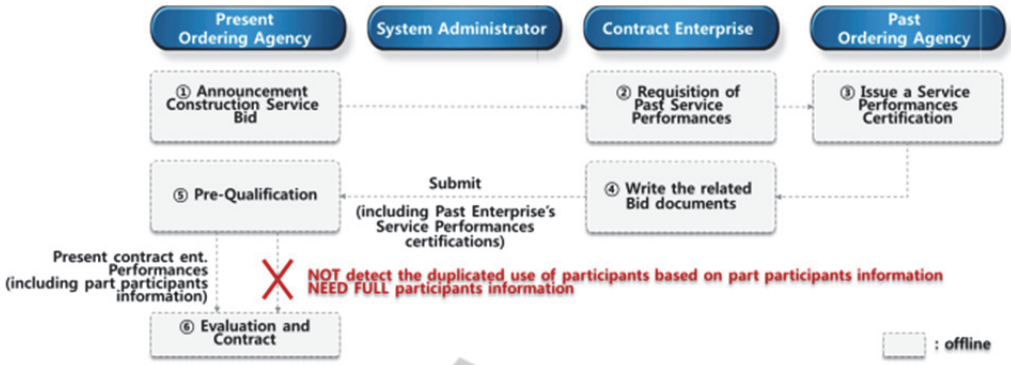

Figure 1: Flow of construction technology service performance management(As-Is).

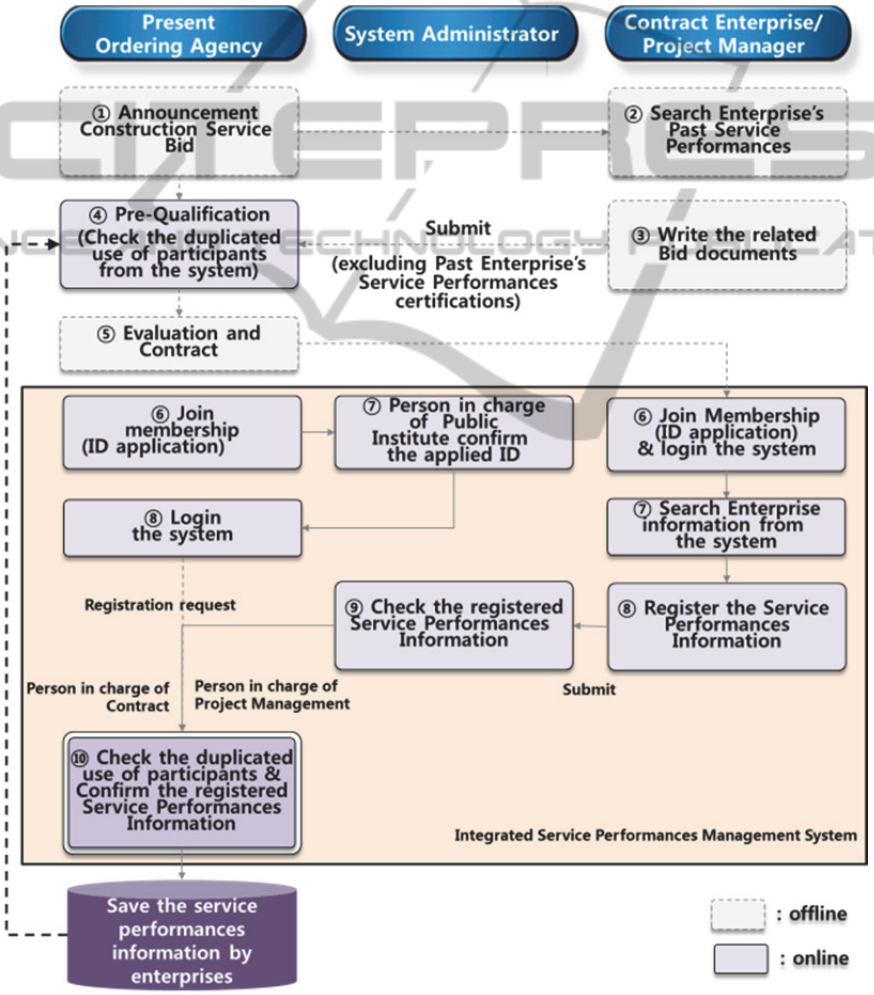

Figure 2: Flow of construction technology service performance management (To-Be).

2.3 Service Performance Information Management Procedure

Public agencies, when placing orders for construction technology services, evaluate the candidate construction engineers' capabilities, performance results, and credibility according to the project performance ability criteria, so as to select bidders.

Towards that end, they receive the performance results of principal contractors and engineers' career certificates so as to identify the service results and to check if the engineers' participation is duplicated, as well as the administrative disposition and changes to the service firms. To submit service results to the public agency, service firms with principal contracts get the service performance confirmation issued by the public agency for which they rendered services, and submit the confirmation to the relevant agency, or they get the service performance confirmation issued by the relevant association and submit it to the relevant public agency. Figure 1 is the schematic diagram of the Bid-Contract Procedure.

This study sought to prepare improvement measures for the service performance information management process to enable the integrated management of service performance information, which is managed by individual public agencies(SeongJin Kim, 2013).

As shown in Figure 2, first, the service manager of the service firm, after concluding a contract, applies for a user ID so he/she can use the system. Likewise, if the service firm is not registered in the system, the manager should request the administrator to register the firm. The manager uses the assigned ID, accesses the system, inputs the service performance results, and requests the responsible staffer of the public agency to approve it.

The service supervisor or contract staffer at the public agency, after concluding a contract, applies for a user ID with the system administrator to be able to use the system. The system administrator confirms whether the applicant is a public agency, and assigns a user ID to him. The service supervisor uses the assigned ID, accesses the system, and confirms and approves the service performance results reported by the service manager. Likewise, the service supervisor confirms the service information, and the contractor staffer confirms the bidding and contract information and approves them.

The above procedure improvement measure was derived after having several discussions with the service supervisors and contract staffers at MOLIT, land management agencies, public corporations and authorities, and local governments, as well as with service firms in various areas, and relevant associations.

3 DEVELOPMENT OF THE PROTOTYPE SYSTEM FOR THE MANAGEMENT OF SERVICE PERFORMANCE INFORMATION

Figure 3 is a prototype screen based on the system concept where the service manager can input service performance results:

Figure 3: Service performance inputting screen.

Figure 4: Screen for monitoring whether the participating engineers is duplicated.

The performance information items, inputted by the service manager, consist of basic service information, bidding and contract information, information on participating engineers, general service information, detailed service information, and overview of the completed performance results.

Putting together such input service performance results, the overview of all the participating engineers, and whether their participation is duplicated, can be monitored, thus preventing the duplicated use of engineers when placing orders for services, offering bids, and signing contracts. The following Figure 4 shows whether the use of participating engineers is duplicated:

4 CONCLUSIONS

This study presented improvement measures for the information classification system and process to enable the registration and management of the performance information of all construction technology services (including design, supervision, and CM) ordered and contracted by individual public agencies, according to the standardized information management system. Furthermore, a prototype system for the management of construction technology service performance was developed based on the improved process to enable public agencies and service managers to register and manage service performance information so as to automatically detect the duplicated use of participating engineers.

If the output of this study goes into full service, it can transparently manage the construction technology service firms' manpower and can determine if the use of their engineers as well as their service performance results are duplicated so as to identify firms with no performance results and false reporters of engineers in real time. Furthermore, the findings of this study provide objective and reliable information on service firms' service performance results, which can be used to select appropriate service firms and can enable online confirmation of performance capability evaluation without the submission of performance data. In addition, by evaluating performance capabilities, the results of service firms' winning orders and qualified firms for construction technology services in the public sector can be easily identified.

To enable the integrated management of the construction technology performance information of all public agencies, empirical tests should be conducted; the laws and systems for mandating the inputting of information should be improved; an information management model for subcontracted service performance, service evaluation, and penalties for poor performance should be prepared; and researches should continue to review a connection with the similar service performance information of relevant agencies' information systems.

ACKNOWLEDGEMENTS

This study was carried out as part of Korea Agency for Infrastructure Advancement's research project on the promotion of construction and transport technologies [*12 Construction Innovation E05, the development of technologies for updating, evaluating, and managing public agencies' orders for services*].

REFERENCES

SuZin Chang, "*An Improvement Plan of Business Bounded System for Efficiency at Construction Industry through Game Theory*", Korea Institute of Construction Engineering and Management, 2004, pp.388-393.

KyongHo Jin, "*An Improvement Plan on Business Bounded System of Construction Technical Services*", Korea Institute of Construction Engineering and Management, vol.13, no.1, 2012, pp.36-39.

SeongJin Kim and NamGon Kim, "*Development of an Information System for managing the Service Performances in Public Construction Technique Fields*", Journal of The Korea Academia-Industrial cooperation Society, vol.14 no.11, 2013, pp.5993-5999.

KyuSung Lee, Hankyu Lee and NamGon Kim, "*A Research on Improvement Scheme for Management Technique of Public Ordering Service Results and Estimation*", 2013, the Korean Institute of Building Construction vol.13 No.1, 2013, 238-239.

ChulJong Yoo, *Improvement of Pre-Qualification in Construction Management Delivery System for Public Construction Projects*, Korea University, 2011.