# 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..

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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-workrelated plan, survey, design, design supervision, construction execution, and safety inspection; facility maintenance, repair, demolition, management, and operation; construction-workrelated 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 servicerelated officials in public agencies and service firms by category, reviewed and complemented them through a number of meetings.

SCIENC	Table 1: Classification system for road construction technology services.	5
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Category	Project stages	Detailed areas
	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.
Design	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.
	Planning	
	Basic design	
Construction	Execution design	
Management	Purchase and procurement	
	Construction	Acting supervision rights (mandatory, part, voluntary), etc.
	Maintenance management	Maintenance and repair

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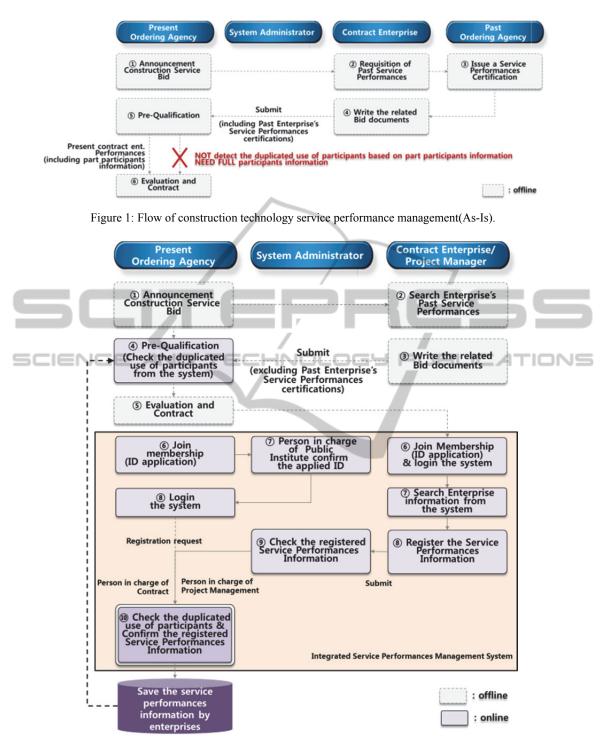


Figure 2: Flow of construction technology service performance management (To-Be).

### 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:

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건설기술용	며 투 한	과리시	스테

e Basic Info	Bid Contract Info	Participant Info	Service General I	nfo Service	Detall Info
역업체용 표약기:	2월보 인상계약정보	합여기술자정보	용역일반경보	용역세부경보	기성실적현황
· 용약기본정보					
ruction 899	일산-파주 도로건설공사	실시설계용역	중에 제공 🔲 문답이 방법	14	
Name ¥E	④ 도로 〇 함만 〇 철도 (	) 공함 ○ 수자원 ○ 실수도 (	○ 하수도 ○ 국토도시 ○ 건	속 () 플랜트 () 기타	
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사업 단계	실계이전당체 [] 기용설	계단계 🗌 실시설계단계 🗌 귀	배조탈당계 🗹 시공당계 🗹 사	후관리단계	
세부분야	④ 감독권한대형 〇 감독권	한대행의 (교 의무 교 부분 🗆	임의) 🗌 유지보수공사		
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개요(사업규5	5		2.5		~
ng Agency ·발주기관					
용역분야 	⊛ 재월 ○ 민자 ○ 민간				
기관(삼來)명	서문지방국토란리청 📑	4			
印표石	걸로균		법인등록번호		
사업자등록변	호 110-83-00348				

Figure 3: Service performance inputting screen.

Participant Name Company Name Project Name		Participation period		The number of duplicated pariod				
기술자명 셉년물	샙년왕	용역업체명	표미팬	발주기관	20	기간	참여용	
		6-6946			시작일	종료일	(%6)	횟수
2108			황룡강권역 하천기본계획수립 및 하천관리대장작성 용역	익산지방국토관리성	2011-09-19	2015-08-28	100	
	(주)삼안	황강하류권역 하천기본계획(변경) 수립 및 하천시설관리대장 작성 용역	부산지방국토관리형	2010-10-25	2015-01-21	100	4	
			성강 하류권역 하천기본계획(변경) 및 하천시설관리대장작성용역	원주지방국토관리성	2011-08-31	2014-08-29	100	
			한탄강권역 하천기본계획 및 하천시설관리대장작성 용역	서울지방국토관리청	2011-08-31	2014-12-16	80.82	
		(주)도화엔지니어링	서낙동강살리기사업(41,42공구) 사후환경영향조사	부산지방국토관리성	2010.07.16	2016-02-28	100	4
감호 🗆			환강살리기 15, 16공구 사업 사후환경영향조사 용역	대전지방국로관리형	2011-04-07	2015-03-16	100	
SX.			한양살리기 \$공구(홍주2지구) 사업 사후환경영향조사	대전지방국토관리성	2010-04-08	2015-03-12	100	
			환강살리기 7공구(중원지구) 샐태하천조성사업 사후환경영향조사	대전지방국토관리청	2009-12-21	2015-03-05	100	
김병 ::		케이베스멥기율(주)	논산천 성용지구 하천환경정비사업 실시설계용역	대전지방국토관리성	2013-10-10	2015-09-29	100	
38	케이메스럽/(평(ヤ)	남강 생초지구 하천환경정비사업 실시설계용역	부산지방국로관리형	2013-10-10	2015-09-29	100	2	
김종호 *** **	(주)천일	역산-고역IC 도로건설공사 기본 및 실시설계	대전지방국로관리성	2013-03-11	2015-02-28	100		
		역산-고역IC 도로컨설공사 기본 및 실시설계	대전지발국토관리철	2013-03-11	2015-02-28	100	-	
김진종	(주)경호엔지니어팅콤함 견혹사사무소	동두천시관대 국도대체우회도로(회천-상패1공구)건설공사 사후환경 영향조사용역	서울지방국로관리청	2007-12-10	2017-12-22	100	2	
		C-CONTE	소천-도계1 국도건설곱사외 1개소 사후환경영향조사용벽	부산지방국로관리형	2007-12-28	2019-10-26	100	
			환경(남환경)실리기사업 1,2,5공구 사후환경영향조사	서물지방국토관리철	2010-03-02	2015-12-31	100	
			글감살리기 #1공구(대철1지구)사업 사후환경영향조사 용역	대전지방국도관리청	2010-04-09	2015-12-31	100	

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

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

The performance information items, inputted by 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.

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