Volume 6 Issue 1 (2023) Page : 818 - 827
SEIKO : Journal of Management & Business
ISSN : 2598-831X (Print) and ISSN : 2598-8301 (Online)

Enhancing Procurement Quality Performance through the Improvement of a Quality Management System

Hasta Dwi Pradana [1] ✉
[1] *Universitas Terbuka*

Abstract

The aim of this research is to develop a Quality Management System (QMS) for construction procurement in order to enhance contractors' performance. The successful implementation of construction work is crucial for the financial and operational performance of an institution. However, delays and disruptions often occur in construction projects due to low-quality work. To address this issue, this study utilized a literature review, questionnaire survey, and statistical analysis to develop a QMS for the procurement process of construction services. The results indicate that the QMS has the potential to enhance the performance of contractors and reduce the frequency of project delays. This study contributes to the field of construction work in institutions, and its findings have practical implications for improving the quality of construction work.

Keywords: *Quality Management System, Procurement, Construction Service, Contractor Performance*

✉ Corresponding author:
Email Address: hasta@ecampus.ut.ac.id

INTRODUCTION

The procurement of goods and services is an essential element of financial governance implementation at a government institution. The procurement process for goods and services funded by the state budget adheres to the guidelines stipulated in Presidential Regulation No. 16 of 2018 on Procurement of Goods/Services for the Government.

The institution's Strategic Plan usually highlights construction work as a Key Performance Indicator (KPI), and its successful execution plays a vital role in achieving overall performance targets, encompassing activities, and financial performance. However, the actual implementation of construction work did not always correspond with the plan or expectations at the institution. There were frequent instances of project delays, leading to operational disruptions.

The problem of poor-quality work resulting from discrepancies between contractor performance and specifications is a major concern in the vicinity of the institution. Various factors, such as design changes, inclement weather, and contractor failure, contribute to this issue (Guerrero, Villacampa, & Montoyo, 2014). To address these challenges, it is crucial to select a good contractor who can provide effective quality management services. The success of a construction project depends on accurate calculations and decision-making processes, which can be achieved by

DOI: 10.37531/sejaman.v6i1.4165

selecting a competent contractor through a proper tendering and pre-qualification process (Alzahrani & Emsley, 2013).

Therefore, the aim of this study was to identify a suitable pre-qualification procedure to select highly competent contractors. The selection of such contractors is crucial to ensure the successful implementation of construction projects and to avoid low-quality work, such as delays in completion, over-budget expenses, and non-compliance with specifications. By implementing effective quality management services, contractors can mitigate factors such as design changes and bad weather. The pre-qualification process plays a significant role in selecting competent contractors, and this study aimed to identify the most appropriate approach for achieving this goal (Palaneeswaran & Kumaraswamy, 2001).

METHODOLOGY

This research uses questionnaires as research instruments that are distributed to respondents. Then, interviews and secondary data collection are conducted to deepen the analysis. Data collection is carried out in 9 stages. The Delphi method is used to obtain a suitable form for quality targets and SOPs. Then, the collected data is qualitatively analyzed for risks to obtain the highest risk factors in the construction service procurement process that affect contractor performance. Next, an analysis of quality management system development actions is carried out, so that the development of a QMS can be carried out in the process of construction procurement to improve contractor performance.

Stage 1 and 2 are carried out through expert validation to validate the business processes, activities, organizational structures, and job responsibilities within the institution’s procurement procedure. The data is analyzed using descriptive analysis, where the respondents provide feedback on whether the current business processes, activities, organizational structures, and job responsibilities are in line with the needs of the process and the organization. The experts involved in this stage range from 3-5 individuals with at least 10 years of experience in procurement, holding a minimum of a Bachelor's degree, and having a good reputation.

Data collection for stages 3 and 4 uses the Delphi method, which involves seeking opinions from relevant sources regarding SOP and quality targets for the process of construction procurement. The Delphi method is deemed appropriate for obtaining answers regarding quality targets and the SOP flow for the process of construction procurement. The criteria for the sources included 3-5 individuals with experience in procurement and a minimum education level of bachelor's degree.

In stage 5, the initial expert validation is conducted. The risk factors will be validated by experts to determine whether these risk factors affect the contractor's performance quality. The purpose of this data collection stage is to reduce irrelevant variables and add any necessary ones. Essentially, experts will examine the constructs and content of the questionnaire to ensure that it can be understood by respondents. Three to five experts with a minimum of 10 years of experience in procurement, at least an undergraduate degree, and a good reputation will be included in this stage.

Stage 6 involves conducting a Pilot Survey to assess the comprehensibility of the questionnaire among respondents. The pilot survey will be distributed to a sample of 5 respondents who must have a minimum of 3 years of experience in procurement and at least a bachelor's degree. If there are any variations in the respondents'

DOI: 10.37531/sejaman.v6i1.4165

perspectives on achieving the research objectives, the questionnaire will be modified to enhance its clarity and understanding for future respondents.

In stage 7, the objective is to identify the most significant risk factors that have an impact on the quality of contractor performance. The survey participants will evaluate the likelihood and magnitude of the impact of each risk factor. The survey will be distributed to individuals who possess a minimum of three years of experience in the procurement field. This stage is important to identify the critical risk factors that may have a negative impact on contractor performance. Selecting experienced respondents is essential to ensure the reliability and validity of data since they possess substantial knowledge and experience in procurement. Employing probability and impact scales is a widely accepted risk management method that enables respondents to evaluate the likelihood and severity of risk factors. This approach aids the study in recognizing and prioritizing high-risk factors that demand urgent attention and mitigation efforts.

Stage 8 involves gathering the highest risk factors, validating them with experts, and determining whether the results are appropriate given the circumstances. This is done by having extensive discussions about the causes, preventative measures, impacts, and corrective actions in order to come up with recommendations for the QMS of the procurement process. The professionals involved in this step ought to be reputable, have at least a Bachelor's degree, and have a minimum of 10 years of experience in the procurement industry.

After acquiring the development actions for the QMS of the construction procurement process, stage 9 involves a final expert validation to assess the acceptability and application of the findings. The professionals involved in this step ought to be reputable, have at least a Bachelor's degree, and have a minimum of 10 years of experience in the procurement industry. Their involvement in this stage is crucial to ensure the validity and reliability of the study's results and to verify the effectiveness of the recommended development actions. By validating the results with experts, the study can obtain valuable feedback and insights to further improve the QMS of the Procurement Process and enhance the contractor's performance.

The research variables are based on an archive analysis of the business procurement process and activities in accordance with Presidential Regulation No. 16 of 2018. Additionally, risk variables that affect contractor performance were identified through expert validation and defined in Table 1.

Table 1. Risk Variables

No	Process		Risk Variables that Affect the Contractor Performance
1	**Procurement Planning**	X1	The procurement plan was not aligned with the needs assessment process.
		X2	The procurement plan lacked a systematic approach to specifying quality standards.
		X3	The procurement plan did not have a structured approach to scheduling, handover time, source, and management system.
		X4	The procurement plan was deficient in quantifying requirements and budgeting.
		X5	The procurement plan was not transparently communicated at the onset of the budget year

DOI: 10.37531/sejaman.v6i1.4165

No	Process		Risk Variables that Affect the Contractor Performance
2	**Procurement Preparation**	X6	The reassessment resulted in numerous changes, including those related to the budget.
		X7	The technical specification/ToR arrangement was not completed.
		X8	The specified product was unavailable in the market.
		X9	A bias toward a particular product was evident.
		X10	Over-specification was observed.
		X11	The market survey result was incomplete.
		X12	An invalid price reference was used.
		X13	No other supporting data was provided and/or accountable.
		X14	The overhead budget was not calculated.
		X15	There was a delay in OEP arrangement time.
		X16	The contract design was imperfect.
		X17	An incorrect contract type was chosen.
		X18	The contract design had not been established during the tendering process.
		X19	The payment guidelines were not clearly regulated.
3	**Construction Selection Preparation**	X20	The selection method was determined incorrectly.
		X21	The qualification method was determined incorrectly.
		X22	The qualification requirements were not fully stated or defined.
		X23	The supplier criteria were unclear.
		X24	The offering valuation method was determined incorrectly.
		X25	The selection process schedule plan was inadequate (for example, too short or too long).
4	**Construction Selection Implementation**	X26	The announcement date was incorrect (not according to the schedule).
		X27	The announcement content was incomplete.
		X28	Short announcement period.
		X29	Announcement error/mistake.
		X30	Technical issues obstructing supplier enrollment in the system.
		X31	Systematic issues prevented the successful download of selection documents.
		X32	The explanation provided was unclear or insufficient.
		X33	No participants submitted offering documents.
		X34	The offering input method was incorrect or invalid.
		X35	The offering document did not meet the required qualifications.
		X36	The price offered was above the OEP or below 80% of the OEP.
		X37	Clarification was not conducted properly during the evaluation process.
		X38	The evaluation process did not produce any qualified supplier candidates.

DOI: 10.37531/sejaman.v6i1.4165

No	Process		Risk Variables that Affect the Contractor Performance
		X39	Mistakes were made during the offering evaluation process.
		X40	The winning candidate withdrew their offer.
		X41	The price and technical negotiation procedures were unclear or poorly defined.
		X42	A candidate did not participate in the technical and budget clarification and negotiation process.
		X43	Agreement could not be reached during the negotiation process.
		X44	The winner's name did not match the tender work requirements.
		X45	The announcement of the winner did not meet the requirements or was incorrect.
		X46	Systematic issues prevented the successful download of selection documents.
5	**Contract Implementation**	X47	Delay in producing the Appointment Letter for Providing Goods/Services and signing the contract occurred.
		X48	The contract signing did not conform to the contract content.
		X49	The contract plan was incomplete.
		X50	Both parties disagreed on the contract content.
		X51	The format for the contract implementation reports was unclear.
		X52	There were various forms of documentation required to achieve the volume of work.
		X53	The supplier was late in submitting the required guarantee.
		X54	The down payment was made, but the supplier did not provide the required guarantee.
		X55	The down payment liquidation was not completed on time.
		X56	The payment for work accomplishment was not made on time.
		X57	The agreed-upon work was not completed.
		X58	The actual volume realization time did not match the contract schedule.
		X59	Changes emerged that hindered the progress of the work.
		X60	The specification realization did not match the contract.
		X61	The work did not match the contract.
		X62	It was difficult to coordinate with the supplier.
		X63	Changes in work items required extra time and an unreasonable budget.
		X64	The work performance did not meet the required specifications.
		X65	There was no good human resource management.
		X66	There was no good time management.
		X67	There was no quality control for every step of the work process.
		X68	The on-duty personnel did not match the contract.
		X69	There was no quality control for the required specifications.

DOI: 10.37531/sejaman.v6i1.4165

No	Process		Risk Variables that Affect the Contractor Performance
6	**Receiving and Checking the Work Result**	X70	Errors in the report formatting.
		X71	The work process documentation was not included in the work result report.
		X72	Absence of standard operating procedures (SOPs) for work result checking.
		X73	The discrepancy in the checking time compared to the contract schedule.
		X74	Work still requires repairs.
		X75	Physical work not entirely completed to the required standard.

(Source: Presidential Decree No. 16 of 2018, processed)

RESULT & DISCUSSION

Several findings in this research were obtained from the opinions of experts. In addition, questionnaires were also used to gather measurable findings from the respondents. The following are the findings discovered in this study:

1. The Business Process

The validation results from experts regarding the business process of government procurement of construction services have been found to be in accordance with Presidential Regulation No. 16 of 2018 and its amendments. All experts agreed on the identification of procurement activities in the construction services process that already exist.

2. Organizational Structure

The results of expert validation on the organizational structure indicate that the experts agree with the existing organizational structure. This organizational structure is the structure used in the process of construction procurement. In practice, the validated organizational structure is a task and functional structure. The procurement function at the institution is located in the Procurement Service Unit. This organizational structure is in accordance with Presidential Regulation No. 16 of 2018 and its amendments. The current job descriptions are already in line with the needs of the process of construction procurement, but not all human resources involved in procurement have a procurement expert certificate, as they only handle administrative tasks.

3. Standard Operating Procedures (SOP)

Based on the results of data collection and analysis, the SOP obtained from the identification of the procurement field within the institution have met the organizational needs in accordance with Presidential Regulation No.16 of 2018 concerning procurement of goods/services by the government and its amendments. The SOP for the process of construction procurement consists of four flow charts that cover all procurement processes, starting from the procurement process, preparation for procurement, preparation for selection, procurement implementation, contract implementation, to the acceptance and inspection of work results.

4. Quality Objectives

Based on the data collection and analysis, there were identified 66 quality targets in the construction services procurement process. These quality targets serve as guidelines for measuring the performance of each activity in the business process.

DOI: 10.37531/sejaman.v6i1.4165

The identified quality targets in the construction services procurement process were then validated and analyzed based on the documents of the National Procurement Board Regulation No. 9 of 2018 on the Guidelines for the Implementation of Procurement of Goods/Services by the Government.

5. Highest Risk Factors

One of the research objectives is to identify the highest risk factors/events that occur in the procurement process of construction services. Therefore, it is necessary to identify the risks of activities that affect quality. Of the 37 activities identified, 73 risk events were identified that could occur in the procurement process of construction services. Subsequently, the identified risks were piloted in a survey of 5 potential respondents. Then, a questionnaire was distributed to respondents to assess the Frequency and Impact of Risks. The results were analyzed using the SPSS application and qualitative risk analysis was performed, resulting in moderate and low-risk values. For the next stage of testing, the 8 highest risk factors were selected to represent 10% of the total variables. However, these 8 variables did not represent every category, so 11 variables were ultimately included after adding from each category. The highest risk variables are as follows:

Table 2. Highest Risk Variables

Variable	Average Frequency Value	Average Impact Value	Risk Level		Risk Ranking
X2	0.493	0.340	0.168	Moderate	1
X5	0.493	0.275	0.136	Moderate	8
X7	0.547	0.270	0.148	Moderate	4
X8	0.480	0.278	0.134	Moderate	9
X21	0.333	0.228	0.076	Moderate	11
X38	0.447	0.192	0.086	Moderate	10
X56	0.467	0.320	0.149	Moderate	3
X58	0.507	0.283	0.144	Moderate	6
X61	0.493	0.315	0.155	Moderate	2
X68	0.513	0.275	0.141	Moderate	7
X73	0.413	0.352	0.145	Moderate	5

The ranking order of risks are 1) The highest-ranking risk event is the error in preparing technical specifications, 2) The second highest risk event is scheduling errors in procurement, 3) The third highest risk event is incomplete information in the announcement, 4) The fourth highest risk event is technical specification/ToR (quantity, quality, time of use, and availability in the market) that has been planned not in accordance with the needs and availability of budget spending, 5) The fifth highest risk event is the error in supplier criteria, 6) The sixth highest risk event is errors in document evaluation, 7) The seventh highest risk event is the absence of a quality program developed by the provider, 8) The eighth highest risk event is delayed mobilization time, 9) The ninth highest risk event is the failure to achieve project targets and implementation, 10) The highest risk event in the tenth position is the provider being unable to be paid because the work is not in accordance with the contract, 11) The highest risk event eleventh is the work results cannot be accepted because the criteria/specifications do not match those listed in the contract.

DOI: 10.37531/sejaman.v6i1.4165

6. Development of QMS for the Process of Construction Procurement

Based on the data collection results, there are causes, impacts, and preventive and corrective actions regarding the highest-risk events. After identifying the highest risk factors, identification of risk response was carried out to reduce failures in achieving quality process targets. For high-risk situations, the impact of errors in technical specification preparation results in work that does not meet the needs, unit price analysis not close to market prices, inaccurate Owner Estimation Price, and others. Errors in procurement scheduling can be caused by a lack of coordination with relevant parties, no analysis of the procurement process execution time from the unit's work section, human errors in filling in the information, and others. Incomplete information in announcements is caused by a lack of accurate information in procurement documents, human errors in filling in information, system errors that cannot load information, and others.

Preventive and corrective actions are two mandatory procedures that must be documented in ISO 9001 (ISO, 2015). In this study, preventive and corrective actions serve as inputs to determine the development actions that can be taken on the QMS. These development actions are then validated and analyzed, and subsequently developed into SOPs and Work Instructions (WIs) to be implemented in practice.

The Recognition Pattern Analysis also reveals several overlapping causes that can be responded to with either preventive or corrective actions. Furthermore, some causes can be addressed by the same preventive action. In the Recognition Pattern of the Procurement Planning category, the risk of scheduling errors in procurement has a common cause with the risk of technical specifications/ToR (quantity, quality, timing of use/utilization, and availability in the market) that do not match the needs and budget availability. Both risks share the common cause of inadequate coordination with related parties, which can be overcome by the same action, namely improving coordination, and establishing two-way communication with related parties. This serves as an example of how a single action can anticipate more than one risk.

After analyzing the risk responses, the next step is to develop a flowchart of the results from the previous stage. Then, the risk response activities are documented in SOP and WI. Therefore, SOP and WI are activities that already include risk response to anticipate the occurrence of risk events. The Work Instruction contains a checklist which is a tool used in quality control, to determine whether quality targets have been achieved or not (Mane & Patil, 2015). The result of this study is the identification of 23 risk-based QMS development actions. The 23 actions are incorporated into the SOP and WI to obtain a Risk-based Quality Management System development.

CONCLUSION

The process of procuring construction services can be divided into six stages, consisting of 29 activities and 31 quality objectives. These stages were identified through a literature review based on applicable regulations and interviews, and the data obtained were validated by experts. During the interview process for each variable, risks inherent in each contractor procurement business process activity were identified, and driving data regarding their causes, impacts, preventive actions, and corrective actions were gathered. As a result, a Quality Management System (QMS)

DOI: 10.37531/sejaman.v6i1.4165

was developed to enhance contractor performance, with particular emphasis on addressing the risks identified as the most significant.

The development of the QMS was achieved through a deep interview process focused on the high-risk factors that had been identified, with detailed discussions on how the QMS development would be implemented, including the use of work instructions and activities checklists. Once the development actions had been determined for the QMS for the process of construction procurement, they were validated by experts to ensure that the results were appropriate and applicable. This development can mitigate the highest risks that exist so that these activities can achieve quality objectives that can improve the contractor's performance quality.

Reference:

Afriansyah, Hardi. *Pengadaan Barang/Jasa Pemeritah untuk Sarana dan Prasarana.* https://www.coursehero.com/file/53725129/Pengadaan-Barang-Jasa-Pemerintah-untuk-Sarana-dan-Prasaranapdf/

Alzahrani, J. I., & Emsley, M. W. (2013). The impact of contractors' attributes on construction project success: A post-construction evaluation. *International Journal of Project Management*, *31*(2), 313–322. https://doi.org/10.1016/J.IJPROMAN.2012.06.006

Berlis, Rita (2019). *Dasar-dasar Audit Pengadaan Barang/Jasa Pemerintah Itjen Kemenristekdikti*

Bochenek, J. (2014). The Contractor Selection Criteria in Open and Restricted Procedures in Public Sector in Selected EU Countries. *Procedia Engineering*, *85*, 69–74. https://doi.org/10.1016/J.PROENG.2014.10.530

El-khalek, H. A., Aziz, R. F., & Morgan, E. S. (2018). Identification of construction subcontractor prequalification evaluation criteria and their impact on project success. *Alexandria Engineering Journal*. https://doi.org/10.1016/J.AEJ.2018.11.010

Guerrero, M. A., Villacampa, Y., & Montoyo, A. (2014). Modeling construction time in Spanish building projects. *International Journal of Project Management*, *32*(5), 861–873. https://doi.org/10.1016/j.ijproman.2013.09.009

Hosseini, A., Lædre, O., Andersen, B., Torp, O., Olsson, N., & Lohne, J. (2016). Selection Criteria for Delivery Methods for Infrastructure Projects. *Procedia - Social and Behavioral Sciences*, *226*, 260–268. https://doi.org/10.1016/J.SBSPRO.2016.06.187

ISO. (2015). *International Organization for Standardization.* Diambil kembali dari iso.org: http://www.iso.org/iso/pub100080.pdf

Joudi, A., Breivik, I. B., Wondimu, P., & Houck, L. D. (2018). Experience with Best Value Procurement in Norwegian Infrastructure Projects. *Procedia Computer Science*, *138*, 783–790. https://doi.org/10.1016/J.PROCS.2018.10.102

LKPP. *Keputusan Deputi Bidang Monitoring-Evaluasi dan Pengembangan Sistem Informasi Nomor 10 Tahun 2019*

LKPP. *Peraturan Lembaga Kebijakan Pengadaan Barang/Jasa Pemerintah Nomor 9 Tahun 2018*

Lukichev, S., & Romanovich, M. (2016). The Quality Management System as a Key Factor for Sustainable Development of Construction Companies. *Procedia Engineering*, *165*, 1717–1721. https://doi.org/10.1016/J.PROENG.2016.11.914

Mane, P. P., & Patil, J. R. (2015). Quality management system at construction project: A questionnaire survey. *Int. Journal of Engineering Research and Applications*, *5*(3), 126-130.

Morkūnaitė, Ž., Podvezko, V., & Kutut, V. (2017). Selection Criteria for Evaluating Contractors Of Cultural Heritage Objects. *Procedia Engineering*, *208*, 90–97. https://doi.org/10.1016/J.PROENG.2017.11.025

Palaneeswaran, E., & Kumaraswamy, M. (2001). Recent advances and proposed improvements in contractor prequalification methodologies. *Building and*

DOI: 10.37531/sejaman.v6i1.4165

Environment, *36*(1), 73–87. https://doi.org/10.1016/S0360-1323(99)00069-4

Peraturan Preisden Republik Indonesia Nomor 16 Tahun 2018 Tentang Pengadaan Barang/Jasa Pemerintah

Peraturan Pemerintah Nomor 68 Tahun 2013 tentang Statuta Universitas Indonesia

Pöyhönen, P., Sivunen, M., & Kajander, J.-K. (2017). Developing a Project Delivery System for Construction Project – A Case Study. *Procedia Engineering*, *196*, 520–526. https://doi.org/10.1016/J.PROENG.2017.07.233

Project Management Institute. (2017). *PMBOK Guide - 6th Edition.* Project Management Institute. (2017). *Project Management Body of Knowledge-6th Edition.* Pennsylvania: Project Management Institute, Inc.

Rashvand, P., Majid, M. Z. A., & Pinto, J. K. (2015). Contractor management performance evaluation model at prequalification stage. *Expert Systems with Applications*, *42*(12), 5087–5101. https://doi.org/10.1016/J.ESWA.2015.02.043

Riduwan. (2008). *Skala Pengukuran Variabel-variabel Penelitian.* Bandung: Alfabeta.

Sekaran, U. (2006). Metodologi Penelitian untuk Bisnis, Edisi 4, Buku 1. Jakarta: Salemba Empat.

Sugiyono. (2001). Metode Penelitian Bisnis. Bandung: CV Alfabeta.

Sugiyono. (2004). Statistik Untuk Penelitian. Bandung: Alfabeta.

Sugiyono. (2009). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung: Alfabeta.

Yin, R. K. (2013). Case Study Research: Design and Methods (5th ed.). Thousand

Oaks, California, United States of America: SAGE Publications.

Yin, R. K. (2013). *Case Study Research: Design and Methods* (5th ed.). Thousand Oaks, California, United States of America: SAGE Publications.