Performance Index of Independent Quality Control Consultant (PMI Consultant) at Semarang-Mojokerto Toll Road Project

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Abstract. PMI Consultants are established to assist BPJT to supervise of Toll Road construction in Indonesia. BPJT received a report on the construction of a Toll Road project from BUJT and PMI Consultants. The study aims to determine the performance of PMI consultants and the priority of any tasks that PMI consultants need to improve. Data were collected from questionnaire survey and interviews of 4 BUJT, contractors and supervisor consultants on the Semarang to Majokerto toll road project. Performance Index calculation results obtained value < 100%. This indicates that the effectiveness of the PMI Consultant performance is still poor. The result with IPA method, PMI performance to BUJT which become the main priority is to review the monthly progress report submitted by BUJT. While the performance of PMI consultants to the Supervising Contractor/Consultant is to monitor the progress of construction.

Keywords: independent quality control consultant (PMI), performance, toll road.

1 Introduction

The Toll Road Management Agency (BPJT) is the governing agency to implement part of the toll road arrangement including the arrangement, management and supervision of toll road enterprises. The existence of BPJT mandated by Law No. 38 of 2004 on Road, regulated in Government Regulation no. 15 of 2005 on Toll Road and stipulated by Regulation of the Minister of Public Works No. 43 / PRT / M / 2015 on Toll Road Management Agency. Related to the authority of the enterprise, BPJT seeks to encourage the involvement of Business Entities and Local Government in the acceleration of toll road development. Toll-road Business Agency (BUJT) is a business agency in the form of a limited company specially established by the winning Business agency for the Toll Road Concession to carry out Toll Road Concession.

BUJT as the government-appointed agency in the toll road concession in Indonesia, BUJT before the construction work begins must appoint Independent Quality Control Consultant (PMI). PMI Consultants work professionally, independently and responsibly to BPJT. PMI Consultants are independent consultants who assist BPJT to carry out control and quality control of Toll Road construction undertaken by BUJT. The scope of work and responsibilities of PMI consultants is to supervise BUJT's obligations from a technical point of view, including the fulfilment of the construction schedule but not to take over the responsibility of the BUJT. In the implementation of its work, PMI Consultant reports the results of activities to BPJT and Directorate General of Highways through the National Road Implementation Centre (BBPJN). Prior to the holding of PMI consultants, BPJT had difficulties in carrying out the supervision

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and control of the quality of existing Toll Road construction in Indonesia and BPJT only received reports on the construction of the Toll Road project from BUJT, this underlying why BPJT held PMI consultants to assist BPJT in supervising and controlling quality to BUJT, contractors and field supervisory consultants. PMI is also tasked with reporting to BPJT on Toll Road construction process without being influenced by BUJT.

Toll road construction projects are also monitored by consultant supervisors / construction management consultants. The works and responsibilities of PMI Consultants and Supervision Consultants are generally similar to supervising toll road construction works. Although the organization of the works and responsibilities of PMI consultants and Supervision Consultants has been established in the regulation, it is possible that in the implementation there may be overlapping of duties and responsibilities.

This study examines the performance effectiveness of PMI consultants on the Trans Java toll road development project, as well as what priority work needs to be improved by PMI consultants to improve the supervision or Quality Control of Toll Road construction. The results of this study are expected to provide the basis for the Toll Road Regulatory Agency regarding the performance of PMI consultants as a consideration in decision-making and policy determination to improve performance in Toll Road project work.

2 Literature references

Performance studies of contractors and consultants have been carried out, [1], [2], [3] and [4] conducted a study to measure the performance of private clients from a contractor perspective. The method used is the Customer Satisfaction Index (CSI), GAP Analysis, and the Importance Performance Analysis (IPA) Method. In general, contractors are satisfied with the performance of private clients and that need to be improved: understanding project needs, management capabilities and the attitude of private clients.

Performance studies of supervisory consultants or construction management consultants have been carried out by several researchers with various methods, regression analysis methods [5], factor analysis [6], path analysis [7]. All research results in the performance of consultants in good categories. [5] found information that aspects of quality, aspects of costs, aspects of personnel qualifications and reporting aspects had a significant influence specifically on increasing or decreasing the performance of consultants. Quantity aspects and time aspects do not have a significant influence specifically on increasing or decreasing the performance of road and bridge project supervisor consultants in North Sulawesi Province.

The four most important roles of a consultant are to help achieve project success, plan and supervise all project activities, facilitators, planners and advisors and as client representatives, and the six most decisive factors of effective consultant performance are consultant competence, consultant capabilities , consultant experience and client support, collaboration and appropriate planning for project implementation, client characteristics and adequacy of consultant resources [6].

There are 7 factors that are considered to influence the performance of the supervision consultant, namely training education, skills, experience, incentives, salary, and motivation. Salary factor is the factor that most influences the performance of the supervision consultant, besides that the training and experience factors are also factors that need to be considered for the consultant's performance [7].

3 Performance Index

Performance index is a measure of the level of suitability to find out how much the customer assessment of performance, and how much the service provider understands what the customer wants for the performance they provide. The performance index is the result of a comparison of performance scores with importance scores.

$$Pi=(Xi/Yi)\times 100\% \quad (1)$$

where:
Pi = performance index
Xi = Score assessment of performance level
Yi = Score of importance level assessment

Performance Index assessment criteria

a. Performance Index > 100%, which means that the performance has exceeded what is considered important with a very good assessment.
b. Performance Index = 100%, meaning that performance does meet what is considered important with good judgment.
c. Performance Index < 100% means that the performance done is not / does not fulfill what is considered important and has not received a good rating.

In the Performance Index < 100% can be explained again as follows:

a. 0 - 32% is considered very bad
b. 33 - 65% is considered not good
c. 66 - 99% is considered not good enough

4 Discussion

Respondents consisted of BUJT, contractors and consultants' employees. Data was taken by interview and gave questionnaires to 25 respondents. Respondent's work experience varies from 10 to 50 years. There are 44% of respondents with 11-20 years of working experience. The education level of strata 1 respondents is 76% and 16% masters. Questionnaires given to BUJT consist of 11 aspects and the supervisory contractors and consultants consist of 15 aspects which are the duties of PMI Consultants.

PMI consultant performance index according to BUJT can be seen in Table 1. The highest value is found in the variable checking the suitability of toll road function products that meet aspects: function, reliability, durability, and ease of maintenance with a score of 90.91%. All rating scores for the performance index by BUJT are below 100%. This shows that the PMI consultant's performance is still not good enough from the BUJT assessment. PMI consultant performance index according to contractors and consultants can be seen in Table 2. The performance index values are generally the same as the performance index according to BUJT. Control and evaluate the quality management system is the highest performance with a value of 91.80%.

Table 1. PMI consultant performance index according to BUJT.

No	Variables	Code	Performance Index	Description
1.	Reviewing monthly construction progress reports submitted by BUJT	Va1	68.42%	not good enough
2.	Conduct monitoring and control of the implementation of material quality test and products conducted by BUJT	Va2	89.29%	not good enough
3.	Examining the suitability of the toll road function products that meet aspects: function, reliability, durability and ease of maintenance.	Va3	90.91%	not good enough
4.	Evaluate the fulfillment of the construction schedule according to the S Curve	Va4	78.79%	not good enough
5.	Providing solutions in the event of delays in the construction project	Va5	73.68%	not good enough
6.	Monitor and ensure the obligations of BUJT in carrying out environmental management and monitoring efforts	Va6	76.47%	not good enough
7.	Evaluate the quality testing report submitted by BUJT	Va7	63.16%	not good enough
8.	Assisting BPJT in the implementation of evaluation of changes in the construction scope in the field proposed by BUJT	Va8	65.00%	not good enough
9.	Submit suggestions / feedback / recommendations through a letter written to BUJT	Va9	78.79%	not good enough
10.	Prepare a weekly program or work plan for the current month and the following month	Va10	87.50%	not good enough
11.	Evaluate the realization of the previous month's work plan	Va11	86.49%	not good enough

Table 2. PMI Consultant performance index according to contractors and consultants.

No	Variables	Code	Performance Index	Description
1.	Control and evaluate the quality management system	Vb1	91.80%	not good enough
2.	Monitoring the progress of construction	Vb2	77.19%	not good enough
3.	Conduct regular field visits	Vb3	81.36%	not good enough
4.	Evaluate the suitability of construction implementation on RTA and RMP	Vb4	84.62%	not good enough
5.	Evaluate the availability and suitability of the needs of human resources, materials and construction equipment in the field	Vb5	91.67%	not good enough
6.	Evaluate work procedures	Vb6	68.85%	not good enough

No	Variables	Code	Performance Index	Description
7.	Evaluate construction phases and methods	Vb7	90.91%	not good enough
8.	Evaluate the fulfillment of the construction schedule according to the S Curve	Vb8	91.67%	not good enough
9.	Providing solutions in the event of delays in the construction project	Vb9	83.61%	not good enough
10.	Provide advice / recommendations related to environmental impact management	Vb10	76.36%	not good enough
11.	Provide an evaluation of the implementation of Occupational Safety and Health (HSE)	Vb11	88.00%	not good enough
12.	Provide an evaluation of the implementation of traffic management in the field during the construction period.	Vb12	98.00%	not good enough
13.	Examining the suitability of the toll road function products that meet aspects: function, reliability, durability and ease of maintenance.	Vb13	96.00%	not good enough
14.	Prepare a weekly program or work plan for the current month and the following month	Vb14	94.23%	not good enough
15.	Evaluate the realization of the previous month's work plan	Vb15	72.13%	not good enough

From the opinion of BUJT, the following matters caused PMI consultant's performance index not so good, PMI Consultants did not help the BUJT in correcting the progress report before submitting it to BPJT. There are even some PMI Consultants who only ask for report data from BUJT for the preparation of reports from PMI consultants that will be submitted to BPJT. PMI consultants do not pay too much attention to material quality and product tests carried out by BUJT. PMI consultants conduct testing of their own materials and products. Problems often arise due to different test results.

Several other things that become findings related to the PMI consultant's performance index are not good is the lack of coordination between PMI's consultants and supervisory contractors / consultants and the lack of scheduled PMI consultant visits to the field. PMI consultant visits according to respondents were carried out 1 or 2 times a week, and there were even respondents who informed them that they had never interacted with PMI consultants.

Lack of visits makes one of the PMI consultant's tasks unable to be carried out properly, for example evaluation of work procedures and evaluation of the construction phase and method.

Some respondents thought that some PMI consultant assignments were not important because there were already supervisory consultants, such as evaluating the availability and suitability of human resource, material and construction equipment needs in the field, evaluating schedule fulfilment, construction according to S curve and evaluating the implementation of health and safety (HSE). There are several PMI consultant tasks that are considered overlapping with the duties of a supervisory consultant.

PMI Consultant's suggestions on the problems faced are still not good, apart from being delivered verbally during field visits and routine meetings, these recommendations should be written in a formal and detailed manner so as to facilitate the contractor to resolve the problem.

Suggestions or recommendations related to environmental management have not been fully implemented by PMI Consultants, for example the problems of Madiun residents in the construction section of the Ngawi-Kertosono Toll Road project. The settlement of the problem was taken over by BPJT.

Respondents assessed the performance of PMI Consultants in checking the suitability of the product function of the toll road is good enough. PMI consultants participate in reviewing the report on the implementation of work from supervisors and consultants.

Importance and Performance Analysis (IPA) analysis has been carried out. The IPA analysis is carried out according to the BUJT and the supervisory contractor / consultant can be seen in Figure 1 and Figure 2.

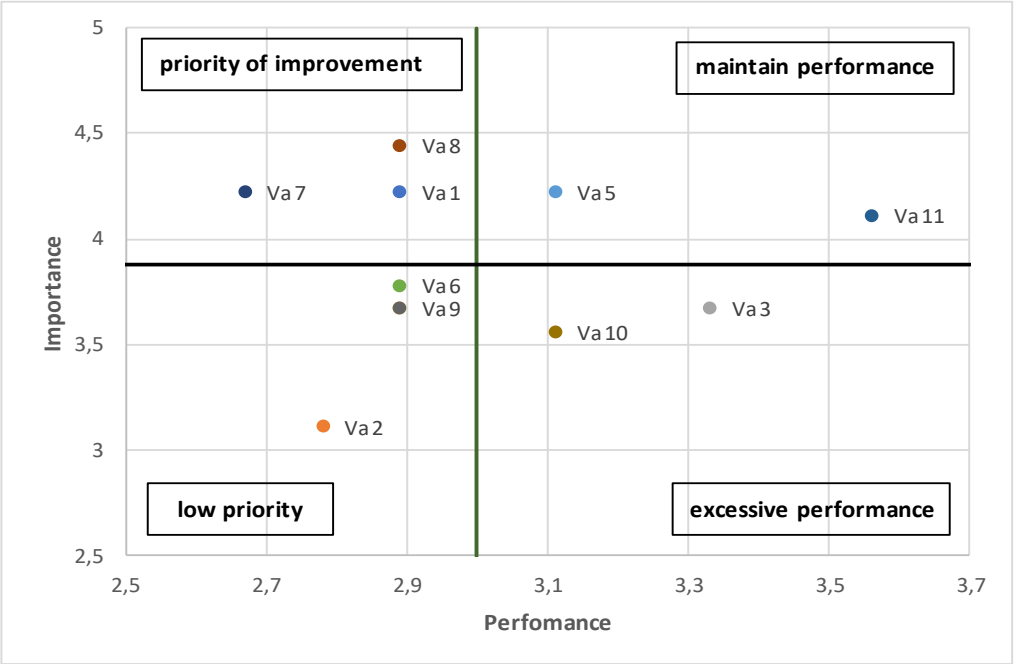

Fig. 1. Importance performance analysis chart according to BUJT.

There are three variables included in the priority quadrant to be improved. The variable is Reviewing monthly construction of BUJT progress reports submitted, Assisting BPJT in the implementation of evaluation of the changes in the construction scope in the field proposed by BUJT, and Evaluate the quality testing report submitted by BUJT. These three things become priorities for improvement. While viewed from the level of importance there are three variables that are not important and are not done well by PMI consultants.

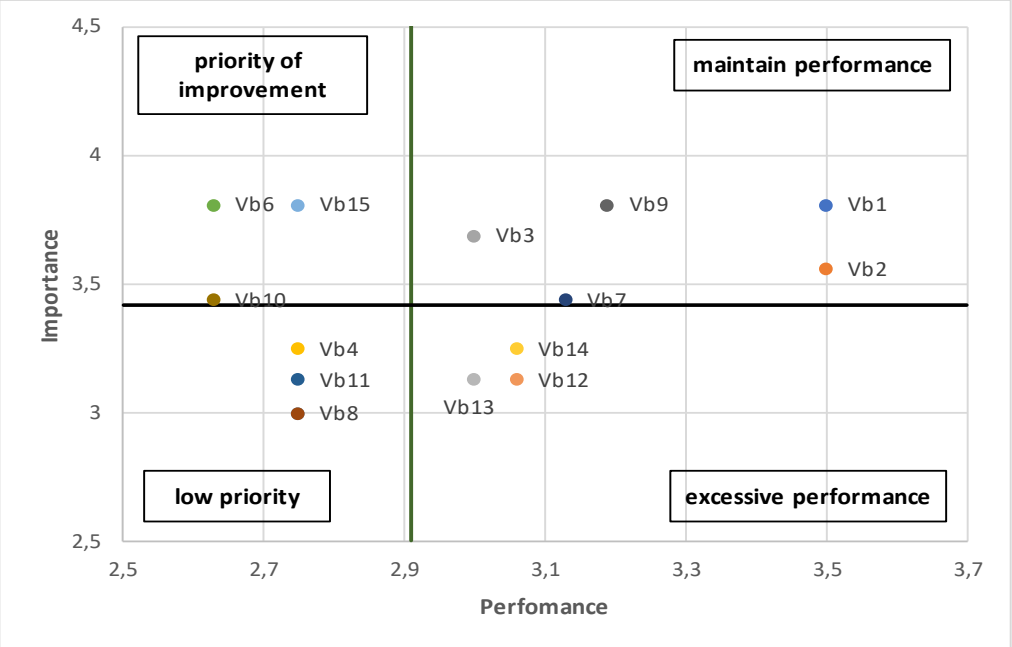

Fig. 2. Importance performance analysis chart according to contractors and supervising consultants.

5 Conclusion

From the results of the Performance Index, all grades < 100% are obtained from both BUJT and Contractors / Supervising consultants. This provides an assessment that the PMI Consultant's performance effectiveness is still not good and all variables must be improved.

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