

## A Stakeholder Satisfaction Level Analysis to the Workperformance of Construction Management Consultant on Dam Refurbishment Project in Bengawan Solo River Basin

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**ABSTRACT :** Refurbishment project in Bengawan Solo River Basin/Area has a high complexity level both in technical or non-technical difficulties, so, assigning a Construction Management Consultant with expectation of having project works according to the plan especially in several aspects of right in quality, right on time, right on cost/budget and has an orderly work administration is necessary. However, in reality, there are work activities that are still not in accordance with expectation due to the lack of workperformance from the Construction Management Consultant (CMC). These workperformance then will be used as basis measurement for assessing service quality that affects the satisfaction level belong to the project stakeholder. So, this study was conducted to answer the extent of satisfaction level of project stakeholder to the workperformance of the construction management consultant (CMC) in Dam Refurbishment Project of Bengawan Solo River area.

Research method for this study was mix methods as started with a qualitative method by identifying variables and workperformance indicators of Construction Management Consultant, and followed by a quantitative method through questionnaire distribution to 53 respondents from the owner and contractor elements which later will be analyzed by two methods of Customer Satisfaction Index (CSI) and Importance Performance Analysis (IPA).

Result of qualitative analysis were able to identify 5 variables and 22 indicators that influence the workperformance of Construction Management Consultant. Result from Customer Satisfaction Index (CSI) analysis obtained a value of 76% (the stakeholders feel 'satisfied' with the workperformance of Construction Management Consultant). Meanwhile, result of Importance Performance Analysis (IPA) with gap analysis and overall conformity level were able to obtain a gap score of -4.72 with an average total conformity level of 20.83, (these aspects are in accordance with stakeholder expectation of the workperformance of Construction Management Consultant). Furthermore, result from Importance Performance Analysis (IPA) as conducted with a Cartesian diagram to evaluate the workperformance indicators have found several indicators that have high priority to be improved and maintained, also indicators that have low priority to be improved, as well as indicators that its level of importance must be increased.

**KEYWORDS:** Trenggalek Regency, Stakeholder Satisfaction, Workperformance, Construction, Management Consultant.

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### I. INTRODUCTION

Water resource facility and infrastructure are present in the form of dam or canal or weir where dams become a major vein of economic growth of a region and require a correct policy in their implementation to enable these facilities provide optimum support to the development and economic growth of a region.

As stated in Regulation of Minister of Public Works (*Peraturan Menteri Pekerjaan Umum*) No.11A/PRT/M/2006, Bengawan Solo River Basin/Area is a cross-provincial river area located in the Central Java and East Java provinces that occupies  $\pm 12\%$  of the entire area of Java Island. Whereas the administrative areas of Bengawan Solo River are located in 20 regencies of Central Java and East Java provinces as ranging from Boyolali, Klaten, Sukoharjo, Wonogiri, Karanganyar, Sragen, Rembang, Surakarta (Central Java province) and Madiun, Pacitan, Ponorogo, Magetan, Ngawi, Blora, Tuban, Lamongan, Gresik, Bojonegoro and Surabaya (East Java province).

Jasa Tirta Public Company I (PJT1) as one of State-Owned Enterprises or *Badan Umum Milik Negara* abbreviated as BUMN is trusted to manage and exploits water resources from five rivers area where one of the

rivers is Bengawan Solo River area. In managing Bengawan Solo River area, PJT 1 operating several water resources infrastructures including Colo Dam, Bojonegoro Movable Dam, Babat Movable Dam and Sembayat Movable Dam where PJT I highly dependent on the condition of facilities and infrastructure of these dams to meet the raw water demand from users, also to control flooding during the rainy season. Unfortunately, condition of facilities and infrastructure of these dams has been experiencing serious damage and disrupting their main tasks and functions in serving the water demand.

In an attempt to address this problem, PJT 1 is carrying out Refurbishment Work Activities for dams in Bengawan Solo River area by utilizing their own investment fund to repair dam infrastructures during 2024. Refurbishment defines as renewing, repairing or renovating process to a building, structure or facility so that these facilities regain optimum function or has better aesthetic and technical value when compared to the previous condition. Dam refurbishment in Bengawan Solo River area is activities of dam repair process which include repair in the irrigation gates also painting and repairing other dam supporting facilities and infrastructures. In total, there are four damaged dams underwent refurbishment activity which carried out by the expense of PJT's internal funds. The repair activity for these dams were carried out within a single-year contract system, so that the implementation process must be arranged in such a way to achieve the optimum and targeted result.

So far, the existing discussion related to Stakeholder Satisfaction Analysis on the workperformance of Construction Management Consultant (CMC) on Dam Refurbishment Project in Bengawan Solo River Area has not conducted widely by many researchers, therefore, the authors raising the study problems of (1) what factors that able to influence Project Stakeholder Satisfaction on the workperformance of Construction Management Consultant (CMC) on Dam Refurbishment Project of Bengawan Solo River area?, (2) How much the Satisfaction level of Project Stakeholder on the workperformance of Construction Management Consultant (CMC) on Dam Refurbishment projects in Bengawan Solo River Area?, (3) How is the Construction Management Consultant (CMC) workperformance on Dam Refurbishment Project in Bengawan Solo River Area?

## **II. LITERATURE REVIEW**

### **2.1. Construction Management**

Construction management is the way of how the resource involved in a construction project can be applied by the project manager in an appropriate way. Main purpose of construction management is to manage and organize construction implementation in such a way that aligned to the obtainable result according to the work specifications.

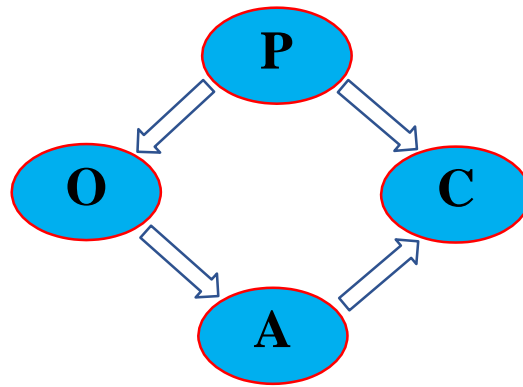
For achieving this goal, better attention focused on the building quality also necessary, apart from the cost used and time implementation. Then, to attain these results, there are several attempts to implement quality control, time control and cost control to the selected project. Three supervision activities above must be executed at the same time, and deviation occurs from one of the results of supervision activities will bring negative impact in the construction end product, where the result will not be the same or not in accordance to the requirement that have been set (Djojowiriono, 2002).

According to Ervianto (2005), as a rule of thumb, there are two understanding in construction management in which the implementation of these understanding is conducted into one unit during work for achieving the project objectives:

1. Construction technology is the study of methods or techniques of work implementation stages for creating a physical building at a project location, in accordance with the required technical specifications.
2. Construction management is how the resources (men, materials, machines, methods) involved in the work can be managed in an effective and efficient way to achieve project goals, in accordance with the provisions/laws relating to construction.

Good management must have the concept of effectiveness and efficiency in its work. Effectiveness and efficiency are two conceptual principals for measuring the management workperformance. Efficiency is the ability to complete the work in a correct way while effectiveness is the ability to choose the right goal or the right equipment to achieve the goals that have beet set prior to working time. Then, efficiency and effectiveness concept in management has meaning of everything must be carried out effectively or in other term must be done in the right, fast, economical, and safe way.

Objective from construction management is achieving the end product (result) in a form of building or infrastructure within a limited time by using existing resources effectively through a relationship between each activity and function described into a project/construction management cycle relationship as shown in the following figure (Figure 1).



**Figure 1.** Relationship of construction / prohect management cycle  
Source: Bernadette (2019)

Next phase of construction management cycle is setting activities for the project/construction management cycle, as explained in the following paragraph:

1. Work planning is the activity of preparing a work plan in compliance with the construction method, for all sequences of work activities that will be carried out together with the time required for each project implementation activity.
2. Work organization is activity of organizing all type of works that will be tasked into construction implementation activities and led by a Dam implementation expert as titled by the General Superintendent. Within this organization scheme, aside from General Superintendent, there are other positions such as Project Division Leaders (responsible for work equipment, laboratory, road, bridge, measurement, logistic, general and base camp), the Project Treasurer, Supervisor, Project Implementation, and some other work divisions. Each position describes its duties, authorities and responsibilities for executing control during construction implementation.
3. Work Implementation or Actuating phase is actualization of any planning and organizing work tasks that has been described above into work implementation/ work construction.
4. Work control is the activity of supervising the work implementation in a series of inspection and testing activities to assure whether construction implementation is in compliance with procedures and references that have been established prior to the work implementation.

The final objective of a project in general is to produce work that includes:

1. Right on time.
2. Right on quantity.
3. Right on quality.
4. Right on budget (in accordance with budget plan).
5. No social clashes to the local community/surrounding community.
6. Fulfills the Occupational Health and Safety (OSH) in good manner.

These objectives can be achieved through the use of good management techniques, including:

1. Creating a favorable situation where solid decision can be taken from the lowest level of management and able to be delegated to those who are capable of handling the specific work.
2. Motivating people at work for giving their best capabilities in performing their tasks by implementing human relations between all people at work.
3. Building or raising work spirit among work groups within the organization to make the function of organization can run entirely as a whole.
4. Provision of facilities that enable people involved in the project to increase their capabilities and scope.

When the objectives cannot be met, it can be interpreted that the project has failed. A failure in construction or in building project is a long-term impact of a work implementation process which innacordance to the work contract/the Work Plan and Requirements (*Rencana Kerja dan Syarat/RKS*) along with the established plan drawings.

## 2.2. The Construction Management Consultant (CMC)

A consultant is a person or company appointed by the work owner and selected due to their expertise and experiences in designing and supervising a construction project, while a construction management consultant is a professional, resilient and independent multidisciplinary body or institution that works and represents the work owner in managing a project from the beginning of planning stage to the time of project operation, and able to

work together with the planning consultant (architect engineer) to achieve the optimal result in terms of time, cost and quality as previously determined or desired (Tarore and Mandagi, 2006).

While Tulelah et al., 2014 stated benefits of using construction management consultant service are:

1. Allowing implementation stage able to begin as soon as possible even though the work planning is not entirely completed which means the implementation time can be shortened (time saving strategy) and the project owner can use the completed facilities ahead of the completion schedule or as soon as possible.
2. For commercial projects where several factors (market, large capital, high loan interest rate and inflation rate) are very important, saving time or time efficiency that able to be applied in project construction means cost efficiency or cost-saving strategy for the project owner.
3. Benefit to the project owner since there will be a double check financial review conducted by a construction management consultant, in addition to the review by their own staff.
4. Project's total final cost always can be predicted in advance since the cost allocation and cash flow are always monitored and updated.
5. No possibility of having double contract if there are profits, taxes and general costs that will be imposed to the project owner (as in the traditional system) by the main contractor.
6. The main material purchase which in general requires a long delivery time can be proceed as quickly as possible.
7. Project supervision is carried out by professional, expert and experienced construction management consultants since project owner in general has limitations in the construction sector.
8. Project management is performed by uniting the design, auction and implementation stages into one complete and integrated unit.
9. Time benefit for the project owner since they do not waste much time for taking care of matters that they are not experts in.

### **2.2.1. Function of Construction Management Consultant (CMC)**

Construction Management Consultants are the consulting assistant for job owner; therefore, they must be able to understand and able to accommodate all input or expectation of job owner, then, able to supervise and accompany planning consultants in making the construction design.

The core functions of construction management consultant are stated to be:

1. Lead and direct all resources of the selected project for achieving the planned goals and objectives of the project.
2. Make sure the project activities will be carried out and the supporting facilities are stand by (available) as agreed and planned in prior time.
3. Assuring the administration of project handling activities able to be carried out in compliance with the agreeable provision (between the project owner and the construction doers).
4. Verify the availability of necessary materials, labors, and work equipment according to the planned schedule.
5. Guarantee the implementation of control over the time, quality, cost and occupation health and safety (OSH) factors are conducted during the work activity.

### **2.2.2. Tasks and Responsibilities of Construction Management Consultant (CMC)**

Tasks of Construction Management Consultant (CMC) are stated in the following lines:

1. Time control, achievement of physical targets (quantity and quality), cost control and administrative order in construction projects starting from the implementation stage, commissioning until the completion of the maintenance period.
2. Coordination to all parties involved in development activities in an effort to achieve the project objectives where the parties involved are project owner, planning consultant, implementing consultant and other related parties.
3. Review and synchronize each design made by the Planning Consultant so there is a synchronization between one part and another which occur in a whole during the project completion.
4. Archiving and arranging all project documents including material test documents, measurement data documents, daily reports, weekly reports, monthly reports, weekly meetings and coordination meetings reports, shop drawings, built drawings and others from the implementing contractor, all documents related to the project starting from the planning stage, auction stage, implementation stage up to the time where the first handover work result and the second handover work result take place.

Whereas the responsibilities of consultant management construction are stated as follows:

1. Construction management consultant has professional responsibility for construction management services carried out in accordance with applicable provisions and codes of ethics and professional conduct.
2. In general, the responsibility of a construction management consultant is to ensure that the work implementation exhibits the following workperformance characteristics:

- a. Timeliness of construction (on time or punctual) according to limit of project budget or time which has been set prior to work time.
  - b. Construction cost accuracy according to the available budget limit that has been set prior to work time.
  - c. Quality and quantity accuracy according to the applicable standard and regulations.
  - d. Orderly contract administration in the implementation of construction project.
3. Construction management consultants are required to analyze and take full responsibility for all technical recommendations from project management.
  4. Construction Management Consultant has obligation to accompany the project management team (technical director) if an audit occurs relating to the project.
  5. Scope of responsibility from professional construction management is not only to the consultant as a company but also those who work as professional construction management experts which are also involved in the project construction.

### **2.2.3. Factor of Consideration in Using Construction Management Consultant (CMC)**

In a large-scale construction project, it requires directed focus, order of plan and good management system since all projects have their limitation but the final goal of a project must be achieved on time with the right quality and at the right cost. Although the complexity level is high, the owner still wants no errors and delays during the implementation of the project.

The construction management consultants must able to manage through all construction stages from the initial stage to the final stage. They are needed because the scope of construction management work includes accuracy in many aspects of quality, time, cost, Occupational Health and Safety, environment, resources, arising risks, also information system.

Meanwhile, authority of construction management consultant at the work implementation stage are listed as below:

1. Lead and direct all project implementation activities.
2. Lead and direct the weekly work progress assessment activities.
3. Create and arrange the scheduling of material, work equipment and labor of the project.
4. Supervise and control the work implementation.
5. Lead and make decisions in internal project meetings.

Thus, a construction management consultant must be an individual who is smart, responsive, and able to understand and able to provide good and maximum work results to the project owner.

### **2.2.4. The Workperformance of Construction Management Consultant (CMC)**

Scope of the workperformance of Construction Management Consultants not only seen from their work result or their work achievement but also from the way the process of work takes place until completion. Workperformance is the implementation of plans which has been prepared, and the implementation of consultant workperformance is carried out by individual (human resources) who have the ability, competence, motivation and interest to the project. Furthermore, Wibowo (2007) stated that influential factors to workperformance of construction management consultant are:

1. Personal/individual factor, by characteristics of knowledge, skill, ability, self-confidence, motivation and commitment owned by each individual.
2. Leadership factor, by characteristics of high quality in providing support or encouragement, enthusiasm, direction and support provided by managers or team leaders.
3. System factor as presented in the consultant work systems, work facilities and organizational processes.
4. Contextual (situational) factor covering any external and internal environmental pressures and changes over the work progress.

## **2.3. Stakeholder**

Freeman & McVea (2001) defines stakeholder as any group or individual who able to influence or be influenced by the achievement of organization goals, and the stakeholder in a construction project according to Abrar's research (2011) is described as follows:

1. Project Owner  
A company or individual who have funds and then handing tasks to company or individual who have expertise and experience about construction project so that the project result is in accordance with targets and objectives set.
2. Consultant  
A company or individual that appointed by the project owner and they have skills and experience according to their respective expertise. The consultant team consists of several positions of:

- a. Planning consultant: A company or individual who has expertise and experience in planning construction projects.
- b. Supervision consultant: A company that has expertise and experience in supervising the implementation of construction projects.
- c. A company appointed as the project owner's representative in project management, from the start of the project to the end of the project.
3. Contractor  
A selected and approved company to carry out the planned construction work according to the project owner's expectation and having responsible for the physical construction of the project.
4. Sub-Contractor  
An appointed party chosen by the contractor and approved by the project owner who has special expertise to carry out part of the contractor's work.

## 2.4. The Satisfaction Level of Service User

According to Tjiptono and Candra in Nina et.al. (2023), satisfaction comes from the latin word of *satis* (good enough or adequate) and *factio* (to do or make).

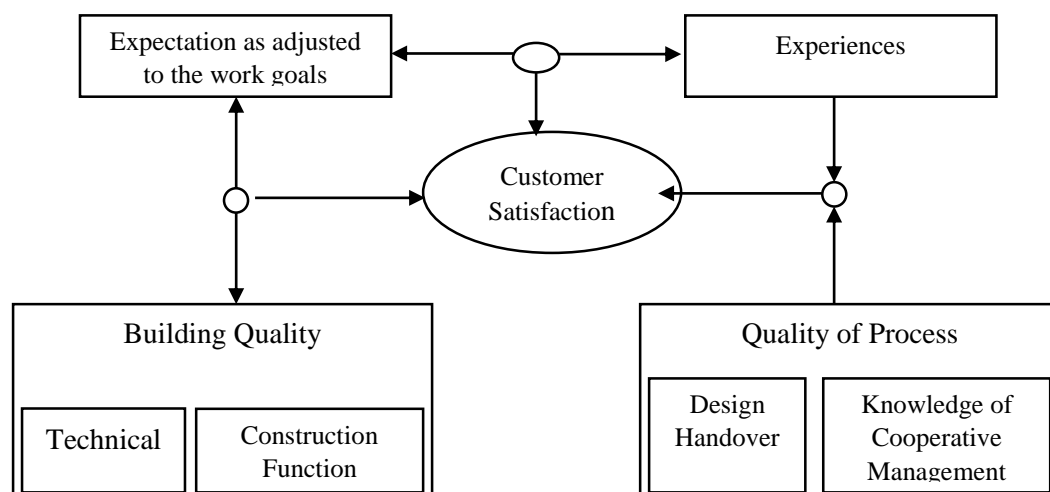
Satisfaction is related to customers as the user of product or services offered. By measuring and understanding the satisfaction of service user, it has several advantages for the company such as:

1. Improving communication process between two parties and achieving the mutual agreement (between service users and service providers).
2. Able to understand the service user wishes as implemented as improvement service during work process.
3. Have a better understanding of problems in services.
4. As a tool to monitor and report services that have been carried out

According to Yunita (2017), satisfaction of the construction project owners as service user depends on quality of services along with services provided by the construction service provider. Customer satisfaction can be used to evaluate work quality which later can be used as a success level assessment of the company's quality improvement program. The reciprocal relationship between workperformance and satisfaction presented in three comparison scheme is carried out in the following ways:

1. The first comparison – building quality to the customer expectation and the goal that adjusted to the building.
2. The second comparison – quality of construction process and the experience that emerges during the construction process.
3. The third comparison – between customer expectations and the work experience.

The reciprocal relationship between workperformance and customer satisfaction in three comparisons is presented in the following figure (Figure 2).



**Figure 2.** A Reciprocal Relationship Between Customer Satisfaction and A Project Quality Level  
Source: Yumita (2017)

## III. RESEARCH METHOD

### 3.1. Research Location

This research was conducted by selecting a location of Dam Refurbishment Project in the Bengawan Solo River area in Sukoharjo Regency, Central Java Province and Bojonegoro Regency, Lamongan Regency, and

Gresik Regency in East Java Province in 2024 which is divided into four (4) Dam Refurbishment work packages as presented in the following table (Table 1):

**Table 1.** Target and motivation of involved parties within a project

No	Work Package Names	Work Site
1	Refurbishment Work of Colo Dam	Sukoharjo
2	Refurbishment Work of Movable Bojonegoro Dam	Bojonegoro
3	Refurbishment Work of Movable Babat Dam	Lamongan
4	Refurbishment Work of Movable Sembayat Dam	Gresik

Source: Jasa Tirta Public Company I

### 3.2. Population of the Research

In this study, population of respondents as the subject study were stakeholders who were directly involved in the Dam Refurbishment Project of Bengawan Solo River area, Sukoharjo Regency in Central Java Province and Bojonegoro Regency, Lamongan Regency and Gresik Regency in East Java Province in 2024 from the internal funding sources of Jasa Tirta I in 2024 listed as the owner (work director, expert staff, supervisor, monitoring team, technical team members) and the implementing contractor team (implementation coordinator, implementer, technical staff).

### 3.3. Sample of Study

A sample is a part of numbers and characteristics own by the population (Sugiyono, 2011). If the study population is large and the researchers cannot possibly study everything in the population (for example: limited funds, manpower and time) then researchers are allowed to use a sample taken from that population. For that reason, type of sample taken from the population must be reliable to be used as representative of the population.

**Table 2.** Number of Research Samples

No	Research Subjects	Number of Samples
1	Owner consisted of:	-
	A Head of Sub Division of Natural Resources Management	2
	B Supervisor	2
	C Supervisor Staff	2
	D Water Gate Operator	19
2	Contractor, consisted of:	-
	a Coordinator	4
	b Implementer	20
	c Technical Staff	4
Total		53

Source: Jasa Tirta Public Company I

### 3.4. Data Collection Technique

Data collection was performed to obtain information needed to achieve the research objectives. The data collection method in this study was literature study, interview, and questionnaire distribution surveys. Literature studies and interviews were conducted to identify variables and indicator related to the workperformance of construction management consultant. Meanwhile, questionnaire distribution was carried out by collecting respondents' opinions and attitudes to measure the satisfaction level of project stakeholders about the workperformance of construction management consultants (CMC) on the Dam Refurbishment Project of Bengawan Solo River area in 2024.

### 3.5. Type of Data and Source of Data

To obtain reliable and valid research result, a complete and accurate data according to the research needs must be gathered and the data in this study was grouped into primary data and secondary data (or according to the data source).

#### 3.5.1. Primary Data

Primary data is a type of data obtained from research subject directly, where in this study was collected through interview and questionnaire distribution (consisting of several questions) addressed to research respondents.

#### 3.5.2. Secondary Data

Secondary data is a type of data obtained out of research subject (indirect source) which is complementary to the primary data. in this study, secondary data was obtained from daily, weekly and mothly

reports, written guidelines from Jasa Tirta Public Company I, applicable Standard Operating Procedures (SOP), letter of award (tender winner) and other related documents.

### **3.6. Data Testing**

#### **3.6.1. Validity Test**

A product moment correlation method was applied in this study for its validity test because it correlates each question item score with its total score. Validity test has testing criteria by comparing r-calculation with r-table as explained in the following explanation:

- If  $r\text{-count} \geq r\text{-table}$ , then the item is declared valid; and
- If  $r\text{-count} < r\text{-table}$ , then the item is declared invalid.

Apart from r-count to r-table comparison, the validity test by product moment correlation method has testing criteria with a significance value at 0.05 level with meaning interpretation explained below.

- If the significance value  $< 0.05$ , then the item is declared valid; and
- If the significance value  $> 0.05$ , then the item is declared invalid.

#### **3.6.2. Realibility Test**

Reliability test in this study used the Cronbach Alpha method with a significance level of 0.05 and performed by dividing the level of reliability with several criteria. There are several Cronbach Alpha criteria:

- If the Cronbach's alpha value ranges from 0.8 to 1.0, then the reliability is stated as good.
- If the Cronbach's alpha value ranges from 0.6 to 0.8, then the reliability is declared acceptable;
- If the Cronbach's alpha value is less than 0.6, then the reliability is declared poor.

### **3.7. Data Tabulation and Data Analysis**

The obtained data from data collection result then be processed by the help of Microsoft Excel and SPSS or Statistical Package and Service Solution software for Windows to get information in the form of graphs and tables. The result of tabulation data will be used to answer questions of the problem formulation, and data tabulation should show type of data collected with an orientation to the objectives which must be achieved.

Next stage in tabulation data is the data analysis as a process or effort made on data to be used as new information, to make the data characteristics easier to be understood and can be useful as a solution to a problem related to research.

Data analysis in this study were using the qualitative and quantitative data analysis. Qualitative data analysis was conducted to identify variables of workperformance of the construction management consultant. While the quantitative data analysis performed by using two methods of Customer Satisfaction Index (CSI) and Importance Performance Analysis (IPA). CSI method was used to measure satisfaction level of project stakeholders that obtained from questionnaire answers from respondents assessed by a Likert scale. Whereas the IPA method was used to map variables and indicators of the workperformance of construction management consultant that needed to be evaluated.

## **IV. RESULT AND DISCUSSION**

### **4.1. Result from Customer Satisfaction Index (CSI)**

#### **4.1.1. Analysis of Customer Satisfaction Index (CSI)**

Customer Satisfaction Index (CSI) analysis employed in this survey to measure satisfaction level from stakeholder to the workperformance of Construction Management Consultant who work on the Dam Refurbishment Project of Bengawan Solo River area. CSI is calculated based on the average value of Importance (MIS), average satisfaction (MSS), weighted factor (WF), and weight score (WS). CSI is an index that provides overview satisfaction level from the stakeholder under a value ranging from 0 % - 100 %. According to the calculation result, CSI tabulation in this study reached 76 % which indicates the stakeholder feeling fell into "Satisfied" category with the workperformance of the Construction Management Consultant who work in Dam Refurbishment in Bengawan Solo River area.

**Table 3.** Calculation Result of Customer Satisfaction Index (CSI) Analysis

Variables	Indicators	N	MIS (Importance)	MSS (Satisfaction)	WF (Weighted Factor)	WS (Weight Score)
Ability of Achieving Project Goals	I1	53	4.13	3.81	4.68	17.85
	I2	53	4.09	3.66	4.64	16.98
	I3	53	3.87	3.74	4.39	16.42
	I4	53	4.00	3.81	4.54	17.29



Variables	Indicators	N	MIS (Importance)	MSS (Satisfaction)	WF (Weighted Factor)	WS (Weight Score)
	I5	53	3.92	3.58	4.45	15.92
Ability of Project Managerial	I6	53	3.92	3.70	4.45	16.45
	I7	53	4.02	3.91	4.56	17.83
	I8	53	4.17	4.15	4.73	19.63
	I9	53	4.09	3.98	4.64	18.46
	I10	53	4.04	3.96	4.58	18.15
Ability of Assuring and Improving the Work Quality	I11	53	3.87	4.02	4.39	17.65
	I12	53	3.94	3.91	4.47	17.47
	I13	53	3.77	4.04	4.28	17.28
	I14	53	4.04	4.00	4.58	18.33
Ability to prevent, reduce, or deal with problems/conflict	I15	53	4.19	4.17	4.75	19.82
	I16	53	4.04	4.09	4.58	18.74
	I17	53	4.09	3.83	4.64	17.77
	I18	53	4.00	3.30	4.54	14.97
Internal Quality from Construction Management Consultant	I19	53	4.08	3.55	4.63	16.43
	I20	53	4.08	3.21	4.63	14.86
	I21	53	3.92	3.51	4.45	15.61
	I22	53	3.89	3.53	4.41	15.58
Total			88.16	83.46	100.00	379.47
Customer Satisfaction Indeks (CSI)						<b>76%</b>

Source: Data Tabulation (2025)

**Table 4.** Customer Satisfaction Index (CSI) Criteria

Index Score (%)	Customer Satisfaction Index (CSI) Criteria
81.00 - 100.00	Very Satisfied
<b>66.00 - 80.99</b>	<b>Satisfied</b>
51.00 - 65.99	Moderate Satisfied
35.00 - 50.99	Less Satisfied
0.00 - 34.99	Dissatisfied

Source: Data Tabulation (2025)

Based on tabulation result, value of the Customer Satisfaction Index (CSI) yielded 76 % and indicates the stakeholders are “Satisfied” with the workperformance of Costruction Management Consultant in Dam Refurbishment project on Bengawan Solo River area. In this category (Satisfied category), it can be concluded that most of the indicators that had been evaluated have a match between the expectation and satisfaction although there are few aspects still require further improvement.

There are some indicators yielded highest satisfaction scores such as:

- Indicator number I8 (Routine Coordination Meeting) → CSI 19.63
- Indicator number I15 (SMK3 Supervising and Environmental Risk) → CSI 19.82
- Indicator number I9 (Monitoring and Project Evaluation) → CSI 18.46

This result is showing the stakeholder are satisfied with the effectiveness of coordination, work safety, and the monitoring and evaluation process within the project. Improvement in these aspects need to be maintained to make sure there is no quality declining for these aspects in the future time.

However, there are some indicators yielded lowest satisfaction scores and still require improvements such as:

- Indicator number I18 (Interpretation of Stakeholder Interest/Needs) → CSI 14.97
- Indicator number I20 (Understanding of Technical Documents and Regulation) → CSI 14.86
- Indicator number I19 (Team Expertise in Natural Resources Conservation) → CSI 16.43

Stakeholders felt the aspects of understanding on the technical documents and natural resource conservation are still below optimum value. So, improvement effort in communication with environmental

stakeholders, upgrading technical training and elevating the understanding of project regulations are needed. By improving these aspects, the expectation is able to reach a higher stakeholder satisfaction level in the future. Overall, the result of the Customer Satisfaction Index (CSI) analysis as mentioned yielding 76 % indicates that the workperformance of Construction Management Consultant has met most of the stakeholder's expectation, although there are some aspects require an improvement in order to attain the "Very Satisfied" category in the future time.

## 4.2. Result of Importance Performance Analysis (IPA) Analysis

### 4.2.1. Analysis of Conformity Level

The Importance Performance Analysis (IPA) analysis employed to measure the extent of Satisfaction Level (of the CMC workperformance) felt by stakeholders in Dam Refurbishment Project in Bengawan Solo River area and the result is in accordance with the level of Importance that the stakeholders expected. Result of IPA analysis describe the level of conformity between expectation and realization that can be used to determine priority rank of improvement in the workperformance of Construction Management Consultant. In this analysis, the average value of importance and level of satisfaction for each indicator is calculated then put into comparison for obtaining value of conformity level. If the value of conformity level is close to or more than 1.00, the meaning is workperformance from the Construction Management Consultant has met stakeholder expectation. However, if the conformity level yielding lower value, then this aspect needs better attention for further improvement.

**Table 5.** Result of Importance Performance Analysis (IPA)

Variabel	Indicator	Importance			Satisfaction			Conformity Level
		N	Total	Average	N	Total	Average	
Ability of Achieving Project Goals	I1	53	219	4.13	53	202	3.81	0.92
	I2	53	217	4.09	53	194	3.66	0.89
	I3	53	205	3.87	53	198	3.74	0.97
	I4	53	212	4.00	53	202	3.81	0.95
	I5	53	208	3.92	53	190	3.58	0.91
Ability of Project Managerial	I6	53	208	3.92	53	196	3.70	0.94
	I7	53	213	4.02	53	207	3.91	0.97
	I8	53	221	4.17	53	220	4.15	1.00
	I9	53	217	4.09	53	211	3.98	0.97
	I10	53	214	4.04	53	210	3.96	0.98
Ability of Assuring and Improving the Work Quality	I11	53	205	3.87	53	213	4.02	1.04
	I12	53	209	3.94	53	207	3.91	0.99
	I13	53	200	3.77	53	214	4.04	1.07
	I14	53	214	4.04	53	212	4.00	0.99
Ability to prevent, reduce, or deal with problems/conflict	I15	53	222	4.19	53	221	4.17	1.00
	I16	53	214	4.04	53	217	4.09	1.01
	I17	53	217	4.09	53	203	3.83	0.94
	I18	53	212	4.00	53	175	3.30	0.83
Internal Quality from Construction Management Consultant	I19	53	216	4.08	53	188	3.55	0.87
	I20	53	216	4.08	53	170	3.21	0.79
	I21	53	208	3.92	53	186	3.51	0.89
	I22	53	206	3.89	53	187	3.53	0.91
Total Average Value			4673	4.01		4423	3.79	20.83

**Source:** Data Tabulation (2025)

As a result from Importance Performance Analysis (IPA), the average value of importance level that expected by stakeholders is 4.01, while the average satisfaction feeling yielding value of 3.79, with the conformity level of 20.83. Several indicators have a high conformity level ( $\geq 1.00$ ), indicating these aspects are in accordance

with the stakeholder expectation. However, there still some indicators gave a low conformity level ( $<0.90$ ) indicating a gap between expectation and realization and make these aspects become a priority for improvement.

Two indicators yielding highest conformity level: (a) indicator 18 (routine coordination meeting), and (b) indicator 115 (supervision of OSH and environmental risks) each with a value of 1.00, indicating the stakeholders are satisfied with coordination carried out and safety system implemented in the project. In addition, indicator 113 (Quality assurance indicator according to standards) has the highest conformity level of 1.07, indicating the work quality produced by Construction Management Consultant somehow exceeds stakeholder expectation.

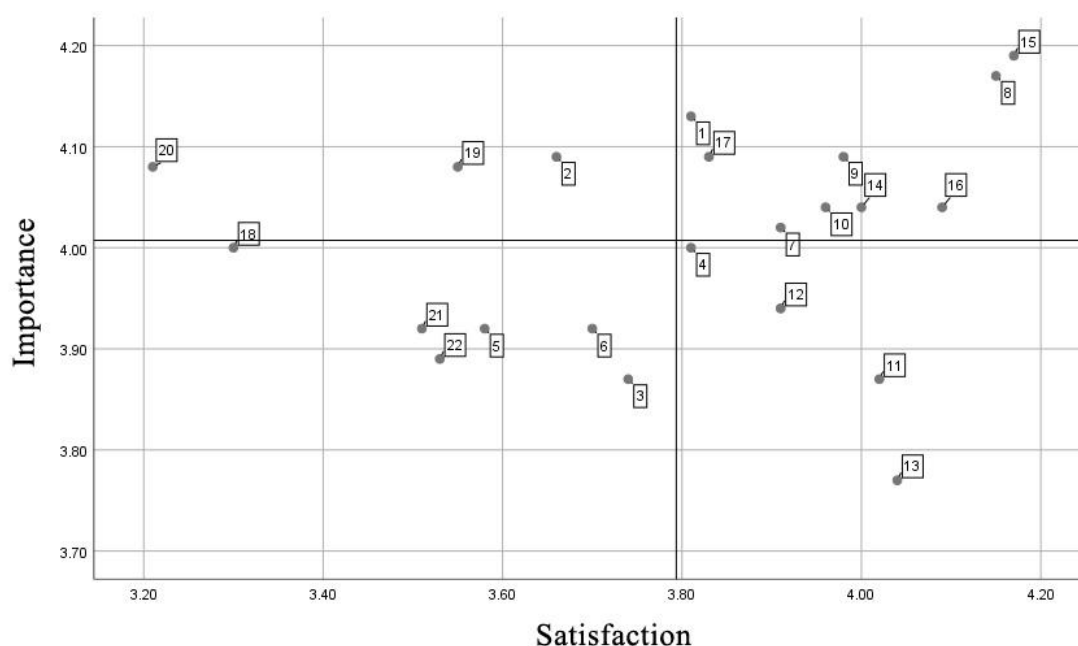
However, there are several indicators yielding low conformity level such as indicator 120 (understanding technical documents and regulations) with a value of 0.79, and indicator 118 (interpretation of stakeholder interest/needs related to natural resources conservation) with a value of 0.83. The internal quality of Construction Management Consultant (indicator 119-122) also has fairly low conformity level (0.79-0.91), thus, the competence and management of Construction Management Consultant becomes the priority for improvement.

As overall result, tabulation result of Importance Performance Analysis (IPA) showed majority indicators have approached the stakeholder expectation with several aspects require strategic improvement, especially in terms of understanding regulations, human resource quality and fulfilling environmental conservation requirements. Therefore, the improvement strategy for increasing the workperformance of Construction Management Consultant must be focused on improving technical training, strengthening communication with stakeholders, and improving documentation and reporting system of a project to ensure the dam refurbishment project in Bengawan Solo River area can run in more optimum way and able to meet the expectations of all related parties.

#### 4.2.2. Analysis of Cartesian Diagram in Importance Performance Analysis (IPA)

The Cartesian diagram in the IPA analysis was employed to map the research indicators based on importance level and satisfaction level felt by the stakeholders toward the workperformance of Construction Management Consultant. The mapping results in the Cartesian diagram divide research indicators into 4 (four) quadrants of:

1. Quadrant I (top priority): Indicators with a high importance level but a low level of satisfaction, so they require immediate improvement.
2. Quadrant II (Maintain these positions/the achievement): indicators with high importance level and high satisfaction level, so the workperformance needs to be maintained.
3. Quadrant III (Low Priority): indicators with low importance level and low satisfaction level, so the improvement efforts can be delayed or not becoming a priority.
4. Quadrant IV (Over/Excessive): indicators with low importance level but high satisfaction level, so, the resources for these indicators can be allocated for other aspect that require more attention.



**Figure 3.** Result Analysis of Cartesian Diagram in Importance Performance Analysis (IPA)  
Source: Data Tabulation (2025)

## **V. CONCLUSION**

According to the result analysis from Customer Satisfaction Index (CSI) and Importance Performance Analysis (IPA) which described earlier in the previous chapter, the authors able to draw some conclusions of:

1. Influential factors of stakeholder satisfaction to the workperformance of Construction Management Consultant (CMC) on the Dam Refurbishment Project in Bengawan Solo River area are stated in percentage scores from high to low in the description below:
  - a. CMC ability to guarantee and improves the work quality has percentage score of 80 %.
  - b. CMC ability in the project managerial has percentage score of 79 %.
  - c. CMC ability to prevent, reduce or resolve problems or conflict has percentage score of 77%.
  - d. CMC ability to achieve project objectives has percentage score of 74%.
  - e. CMC internal quality has percentage score of 69 %.
2. Result of Customer Satisfaction Index (CSI) analysis showed the satisfaction level of stakeholder to the workperformance of Construction Management Consultant (CMC) is in the "Satisfied" category with percentage value of 76%. The stakeholders feel satisfied with the workperformance of Construction Management Consultant (CMC) in several aspects such as in the effectiveness of coordination, implementation of Occupational Safety System or SMK3, and supervision of work quality. However, there are several gaps existing that need to be fixed, especially in areas of understanding regulations, environmental management, and technology utilization in the project supervision.
3. The result from Importance Performance Analysis (IPA) showed several workperformance indicators belong to Quadrant I (Top Priority) meaning these indicators have high importance level but have low realization. Several aspects which need primary attention are Construction Management Consultant understanding about project regulations, involvement in natural resources conservation and technological innovation in the construction process. Meanwhile, some aspects such as project coordination, work safety supervision, and work progress report are including into Quadrant II (Maintain the work achievement) meaning these indicators have good workperformance and need to be maintained. Although there are other indicators that fell into Quadrant III (Low Priority) and Quadrant IV (Excessive/Over), in general, IPA analysis showed the Construction Management Consultant has met most of the expectation from the stakeholder. However, to increase the satisfaction level to reach a higher level, some aspects need to be improved such as area of project documentation, human resources skills related to technical and regulatory aspect, and development of more efficient work methods by utilizing more sophisticated technology.

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