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Performance Analysis of Supervising Consultants Based on Communication Management in Construction Projects

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Abstract

Effective and efficient communication is the key to success in every field of work, including construction projects. In a study, it was found that the percentage of project success reached 80% if a project team implemented an effective and efficient communication system. Data analysis methodology is used with Importance Performance Analysis (IPA) and Customer Satisfaction Index (CSI), through questionnaires distributed to respondents who are actively involved in a construction project with various project focus areas. The aim of this study is to determine the relationship between effective and efficient communication management and the performance of supervisory consultants in construction projects. Analysis of the performance of the supervising consultant was conducted on one of the construction projects. Based on the analysis of the Importance Performance Analysis (IPA) and Customers Satisfaction Index (CSI) methods in quadrant 1, it is necessary to get improvements and priority attention to achieve the target expectations and performance of the supervisory consultant. In the Analysis with the CSI method, the supervisory consultant on the construction project needs to conduct evaluations, performance improvements, and development of existing supervision attributes so that the main factors planned can be achieved according to the plan and target.

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Introduction

Project management involves the stages of planning process, resource control, organization arrangement to achieve the specified project objectives (Gray, Larson, and Desai 2006) [10]. The main aspects in project management include several things such as project planning, organizing, change control, quality control, risk management, resource procurement management, time management, cost management, communication management, human resource management, environmental management, evaluation and reporting, and integration management (Sukardi and Biantoro 2025) [23].

In a dynamic project environment, efficient cooperation, quick problem solving, and timely decision making depend on effective communication (Lawson-Body and Limayem 2004) [15]. The main problem in construction projects is related to communication management which is often overlooked, resulting in project failure, misunderstanding, and obstacles.

A construction project has components of parties involved and has their respective roles and responsibilities including, project owners, consultants, and contractors (Husin *et al*. 2024) [12]. Among the relationships between these parties, coordination and cooperation are needed that are structured and established in two directions so that errors or poor communication patterns in construction projects that have an impact on project performance and objectives can be minimized (Erlita, Amin, and Bintoro 2023) [5].

Communication itself is the process of conveying information from one party to another, directly or indirectly. Project communication management is the knowledge that uses processes to ensure the timeliness and suitability of the era, collection, distribution, storage, retrieval, and final disposition of project information (Ministry of PUPR 2010) [17]. Based on this definition, a simple analogy is found that the existence of communication has an important role in various things, one of which is in the project (Ali, Amin, and Husin 2019) [1]. In addition, communication is the action of one or more people in sending or receiving information for a particular context and has a certain influence so that feedback is obtained which is influenced by the environment in which communication occurs (Ebrahimi and Sadeghi 2013) [4].

(Susetyo, Budinata, and Bintoro 2021) [21] stated that performance is part of assessing a person's performance against planned targets. Performance generally refers to the level of success in completing tasks and responsibilities with a benchmark for ability to achieve common goals (Cronin and Taylor 1994) [3].

In construction service relationships, project performance is the result of work carried out by the contractor or supervising consultant in the implementation of the construction project accompanied by implementation documentation (Pamungkas and Susetyo 2024) [18].

Consultant performance is demonstrated through the work results achieved by the consultant in carrying out the tasks and responsibilities given and based on skills, experience, and sincerity and time (Setyo, Muhammadun, and Oetomo 2022) [20]. Monitored performance monitoring system management will be able to provide positive and negative impacts from the implementation of an operational policy through the results of the level of achievement based on the objectives planned at the beginning (van Well-Stam, Lindenaar, and Van Kinderen 2004) [25].

Supervision is part of the process of evaluating data with project facts based on standard operating instructions (SOP) for supervision by the supervising consultant. Consulting services by the supervising consultant are appointed directly by the owner or the assignor represented by the PPK assisted by the Development technical team in carrying out coordination and control tasks for all technical development activities from the planning stage to the implementation of construction and maintenance periods, both those related to management aspects and technology and engineering at the construction implementation stage (Fellows *et al*. 2009) [6].

The basic purpose of supervision in general is to obtain work results so that they achieve targets that meet quality standards, are timely, cost efficient, and can provide benefits according to the objectives of the construction project (Gransberg, Popescu, and Ryan 2006) [9]. The results of supervision by the consultant must be recorded and documented so that they can be archived and monitored for reporting purposes and taking corrective actions that need to be taken and need to be fixed (Amin, Alisjahbana, and Simanjuntak 2018) [2].

Research Method

The research method used in this scientific article is descriptive qualitative with the Importance Performance Analysis (IPA) and Customers Satisfaction Index (CSI) methods which are studied in depth and interpreted in order to produce the planned conclusions (Shadiq and Isradi 2024; Sianturi and Isradi 2024).

Importance Performance Analysis (science)

Importance Performance Analysis (IPA) is a technique used by using priority attributes based on performance measurement and expectations as a method in developing and analyzing questionnaire data (Khoirul and Isradi 2024). The results of the data analysis development are then evaluated based on a questionnaire sample survey to several respondents (Firdaus *et al*. 2022). Data collection was carried out using a closed questionnaire where the questionnaire has been provided with alternative answers so that respondents can choose according to their characteristics (Firdaus *et al*. 2021).

The IPA method uses qualitative-quantitative descriptive analysis in analyzing research power to answer the formulation of the problem regarding the level of implementation of consultant performance against planned performance expectations. Analysis of performance levels and expectations can produce a Cartesian diagram that shows the location of factors or elements that are considered to meet the supervision plan, in which the existing factors will be described in four quadrants (Madani *et al*. 2024).

The horizontal axis (X) in the IPA Cartesian diagram contains the average value of the satisfaction score (performance), while the vertical axis (Y) contains the average value of the importance score. The Cartesian diagram is a structure divided into four parts which are limited by two lines that intersect perpendicularly at points (X, Y), where (X) is the average value of the consumer satisfaction level score from all attributes and (Y) is the average value of the employee importance level score from all attributes that affect employee satisfaction (Rachmadina et al. 2023).

Customers Satisfaction Index (CSI)

IndexCustomer satisfaction is a multidimensional concept. Measuring customer satisfaction index requires a number of actors consisting of manifest variables and latent variables. Latent variables are concepts that are measured to determine customer satisfaction. These variables cannot be measured directly and can be measured with manifest variables. Latent variables have a cause-and-effect relationship in a customer satisfaction index model (Kinasih and Permata 2022).

Result and Discussion

Respondent Characteristics

Based on the respondents' work period, it can be seen that the average respondent has a work period of <5 years as many as 8 people or 53%, then respondents with a work period of 5-10 years are 6 people or 40%. Respondents with a work period of 10-20 years are 1 person or 7%. For respondents with a work period of > 20 years there are none.

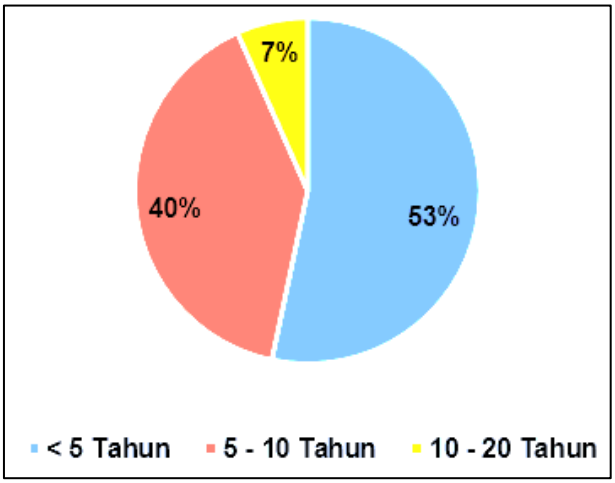

Fig 1: Frequency of Respondents Based on Length of Service

Based on the respondents' positions in various existing construction projects, it is known that 2 respondents are engineers with a percentage of 13%, 3 respondents are inspectors with a percentage of 20%, and 5 people each as supervisors and other positions with the same percentage, namely 33% each. Shown as in the following diagram:

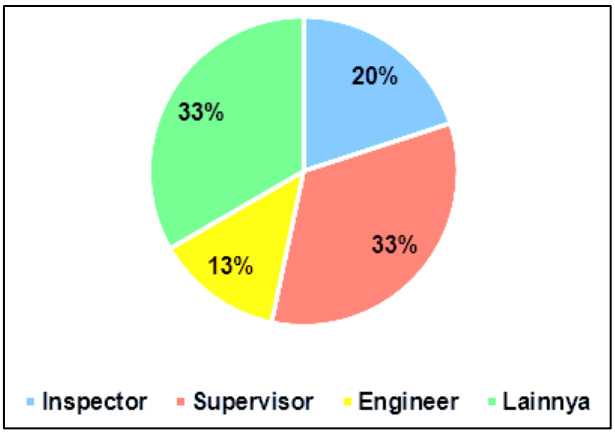

Fig 2: Frequency of Respondents Based on Position

Importance Performance Analysis (IPA) Method

Iso-priority Line, also known as the iso rating line, is a development of the IPA diagram framework, namely the addition of a slanted line with a 45° angle. This line is a representation of ideal conditions and optimal points in the IPA matrix map and aims to divide areas based on their priorities. Attributes above this line are attributes that must be prioritized for development because they are considered "regions of opportunities."

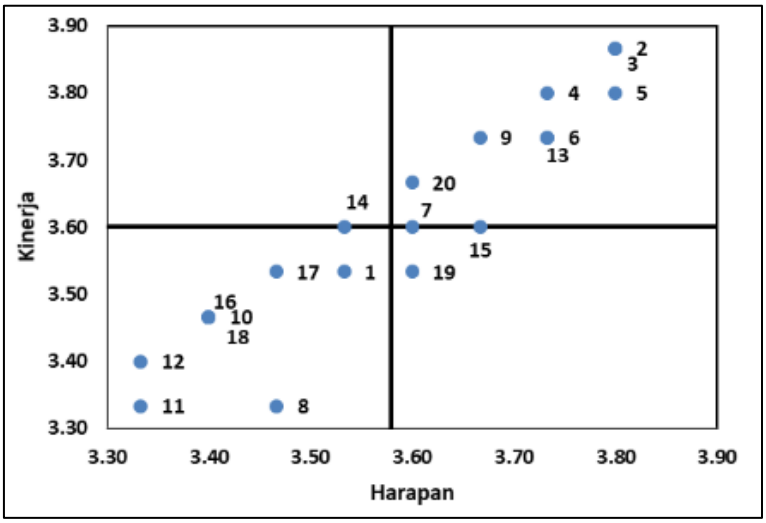

Fig 3: Science Quadrant Based on Respondent Data

1. Quadrant 1

a. Attribute 14: Detecting and providing corrections to defects in work results

2. Quadrant 2

a. Attribute 2: Control and ensure projects are on time
b. Attribute 3: Control and ensure projects are on cost
c. Attribute 4: Carrying out inspections, corrections and approvals on every work implementation (shop drawings) submitted by the construction implementer.
d. Attribute 5: Supervise the implementation of work to ensure it is in accordance with specifications.
e. Attribute 6: Explain work actions, scope of work, and specifications well to all project stakeholders.
f. Attribute 7: Coordinate with all stakeholders involved in the project
g. Attribute 9: Periodically make reports/monitoring & evaluation of the progress of work implementation
h. Attribute 13: Conduct quality checks on work results to ensure they comply with specifications.
i. Attribute 15: Control the implementation of the Occupational Health and Safety Management System (SMK3) on projects properly
j. Attribute 20: Comprehensive understanding of documents for construction implementation

3. Quadrant 3

a. Attribute 1: Carrying out control and supervision of the use of resources.
b. Attribute 8: Lead regular meetings in planning and solving problems in the field
c. Attribute 10: Compilereports and minutes regarding work progress and payment of installments for construction work implementation
d. Attribute 11: Provide recommendations for changes to the scope (materials, and implementation methods) if necessary.
e. Attribute 12: Providing consulting services at all times (during the project) to all project stakeholders
f. Attribute 16: Prevent, reduce, or resolve any problems that exist within the project.
g. Attribute 17: Prevent, reduce, or resolve any problems/ actions from parties outside the project (example: public protests due to noise during the construction process)
h. Attribute 18: Understand and be able to convey the owner's needs and desires quickly and accurately

4. Quadrant 4

Attribute 19: Every individual involved as part of the MK Consultant team is an expert in their field.

Customer Satisfaction Index (CSI) Method

It can be known through several stages:

a. Determining the Mean Importance Score (MIS) is the average value of the level of expectation for each variable or attribute.
b. Determining the Mean Satisfaction Scroe (MSS) which is the average value of the level of reality felt by each variable or attribute.
c. Create Weight Factor (WF).
d. Creating Weight Score (WS).
e. Determine the CSI value based on the criteria in the questionnaire based on the CSI value criteria see table 1.

Table 1: Customer Satisfaction Index (CSI) Value Criteria

CSI Value	CSI Criteria
0 – 25 %	Not important
26% – 50%	Quite Important
51% - 75%	Important
76% - 100%	Very important

Based on the respondent data, the following results were obtained:

a. Mission = $\left[\frac{\sum_{i=1}^{n} Yi}{n}\right]$ = 71.60

Information:
Yi = Attribute importance value
n = Number of respondents

b. MSS = $\left[\frac{\sum_{i=1}^{n} Xi}{n}\right]$ = 72.07

Information:
Xi = Attribute satisfaction value
n = Number of respondents

c. WF = $\left[\frac{MISi}{\sum_{i=1}^{p} MISi}\right] x\ 100\ \%$

MISSION = Average value of i-th interest
$\sum_{i=1}^{p} MISi$= Total average of interests from i to p

Table 2: WF Values

No.	Hope	WF
1	3.53	4.93
2	3.80	5.31
3	3.80	5.31
4	3.73	5.21
5	3.80	5.31
6	3.73	5.21
7	3.60	5.03
8	3.47	4.84
9	3.67	5.12
10	3.40	4.75
11	3.33	4.66
12	3.33	4.66
13	3.73	5.21
14	3.53	4.93
15	3.67	5.12
16	3.40	4.75
17	3.47	4.84
18	3.40	4.75
19	3.60	5.03
20	3.60	5.03

d. W.S. = $Wsi = WFi\ x\ MSS$

WFi = z-weighted factor

Table 3: WS Values

No.	Hope	Performance	WF	W.S.
1	3.53	3.53	4.93	17.44
2	3.80	3.87	5.31	20.52
3	3.80	3.87	5.31	20.52
4	3.73	3.80	5.21	19.81
5	3.80	3.80	5.31	20.17
6	3.73	3.73	5.21	19.47
7	3.60	3.60	5.03	18.10
8	3.47	3.33	4.84	16.14
9	3.67	3.73	5.12	19.12
10	3.40	3.47	4.75	16.46
11	3.33	3.33	4.66	15.52
12	3.33	3.40	4.66	15.83
13	3.73	3.73	5.21	19.47
14	3.53	3.60	4.93	17.77
15	3.67	3.60	5.12	18.44
16	3.40	3.47	4.75	16.46
17	3.47	3.53	4.84	17.11
18	3.40	3.47	4.75	16.46
19	3.60	3.53	5.03	17.77
20	3.60	3.67	5.03	18.44

e. WT = $\sum Ws$ = 360.99

f. CSI = $\left[\frac{\sum_{i=1}^{p} WSI}{HS} \; x \; 100\%\right]$ = 0.902 = 90,248

Information:
$\sum_{i=1}^{p} WSI$= Total average of interests from i to p
HS = Maximum scale used or Highest Score

With the CSI analysis, the CSI value obtained was 0.902482 or 90.248%, which is in the interval of 76% - 100% with the description of the criteria index "Very Important".

Table 4: Result Categories of Customer Satisfaction Index (CSI) Value Criteria

CSI Value	CSI Criteria
0 – 25 %	Not important
26% – 50%	Quite Important
51% - 75%	Important
76% - 100%	Very important

Conclusions

Based on the analysis of the Importance Performance Analysis (IPA) and Customers Satisfaction Index (CSI) methods in quadrant 1, it is necessary to get improvements and priority attention to achieve the target expectations and performance of the supervisory consultant. In the Analysis with the CSI method, the supervisory consultant on the construction project needs to conduct evaluations, performance improvements, and development of existing supervision attributes so that the main factors planned can be achieved according to the plan and target.

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