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Factors Control Identification of Quality Supervisor (QSpv) to Improving Quality Performance in Verde II Condominium Project in Kuningan Jakarta

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Abstract To produce quality construction work, it certainly cannot be separated from the role of human resources (HR) in the implementation and supervision functions. One part of human resources that carries out the supervisory function in construction companies is the Quality Supervisor (QSpv). The complexity of roles and responsibilities is a challenge for a Quality Supervisor in handling various obstacles related to the quality of construction projects in carrying out their supervisory functions. This research was conducted to determine the priority factors of the Quality Supervisor's oversight function in improving the quality performance of construction projects, and determine the strategy for increasing the role of the Quality Supervisor. Data is collected through questionnaire distribution and processed using the method of relative importance index (RII). The results of the study show that there are 5 strategic recommendations in improving the quality performance of construction projects based on identified priority factors, namely setting quality goals, targets, and targets as guidelines for improving performance, as well as measuring the success or failure of the quality control program; anticipating the risk of material shortages / losses can be done by applying inventory management; integration between 3 elements is needed, namely systems, business processes, and organizations to make the project consistent in carrying out project management and remain on the right track, continuity between the three elements is the key to the quality value of a project to be maintained; implement two-way communication between leaders and subordinates in the delivery of information so that information can be received and well understood by all project implementing elements; placement of workers in certain tasks and jobs must be adjusted to the field of expertise of the workers concerned. If it is not urgent, workers are not permitted to carry out multiple tasks which are not their expertise.

Keywords pervisory function, Quality Supervisor, quality performance

1. Introduction

Construction projects are a set of interrelated activities where there are starting points and end points, as well as certain results. Construction projects as needed skills of expertise and organization. Every construction project is unique, not even the same project. Dipohusodo [1] states that the project is an effort that mobilizes available resources, which are organized to achieve certain important goals, objectives and expectations, and must be in accordance with a limited period of time in accordance with the agreement. With a limited duration of the project, the construction service provider still has to prioritize the quality of the building to be handed over.

To produce quality work, of course can not be separated from the role of human resources in the function of implementing supervision. One part of human resources that carries out the supervisory function of construction companies is the Quality Supervisor (QSpv). The term Supervisor is still not used too much in Indonesia.

Based on the book Role and Responsibility of Quality Supervisors issued by PT Total Bangun Persada, Quality Supervisors function is to coordinate and ensure every work to achieve the target supports while still paying

attention to time, cost, repair and cleanliness, as well as occupational safety and health and environment. The duties and responsibilities of the Quality Supervisor are as follows:

1. Prepare and ensure work facilities, support and manage implementation permits. The facilities in question are shop drawings, implementation permit, work instructions, measuring instruments, implementation methods, and personal protective equipment.
2. Ensure the availability and suitability of materials, tools, sub-contractor workforce and foremen.
3. Providing daily direction to all sub-contractors and foremen in terms of quality targets in accordance with standards, target time according to schedule, volume target, number of workers and how to work
4. Supervise and ensure that every stage of work from beginning to end is done thoroughly, using shop drawings, instruction work /inspection and test plans, work methods, checking the tolerances in accordance with specified quality standards, and meeting the schedule of each stage of work.
5. Conduct internal tests and inspections of work results (with sub-contractors and product quality)
6. Perform a final check (defect list) with the owner.

The complexity of roles and responsibilities is a challenge for a Quality Supervisor. QSpv is required to be able to handle various obstacles related to the quality of construction projects that may occur in carrying out its supervisory functions. For this reason, in-depth research is needed on the factors of the Quality Supervisor's oversight function in improving the quality performance of construction projects, as well as strategies for increasing the role of Quality Supervisors.

In general, the research analysis method begins by determining the factors and research variables through a literature study that is validated by experts, followed by data collection through questionnaire distribution to 20 Quality Supervisor respondents at the Verde II Condominium Kuningan Jakarta project in Setia Budi District in the Kelurahan DKI Jakarta Province Rubber.

Data from the distribution of questionnaires were processed using statistical analysis with a rating method relative importance index (RII). RII analysis is used to give a rating or ranking of the research factors based on the results of the questionnaire recapitulation, so that the top factor with the highest RII value from each factor category is the priority factors of the Quality Supervisor's oversight function in improving the construction project quality performance.

2. Research Problem

Based on the background research, several elements of the problem can be formulated as follows:

1. What are the priority factors of the Quality Supervisor (QSpv) on supervision function that can improve the performance of the quality of the Verde II Condominium Kuningan Jakarta project?
2. What is the recommended strategy for increasing the role of Quality Supervisor (QSpv) in maintaining quality performance on construction projects?

3. Literature Review

3.1. Construction Project

Heizer and Render [2] explain that a project can be defined as a series of tasks directed at a main outcome. Cleland and King [3] state that the project is a combination of several resources, which are collected in a temporary organization to achieve a certain goal.

3.2. Quality Performance in Construction Project

The term performance is a translation of performance that is often interpreted by scholars as appearance, performance, or achievement [4]. Prawirosentono [5] defines performance as the work that can be achieved by a person or group of people in an organization, in accordance with their respective authorities and responsibilities, in order to achieve the objectives of the organization in question legally, not violating the law and in accordance with morals and ethics.

According to Feigenbaum [6], quality is the overall combination of product and service characteristics of marketing engineering, fabrication and maintenance that make products and services used to meet customer expectations. According to Supriyono [7], quality is a level of good or bad. Quality can be defined as the level of excellence.

3.3. Biaya Mutu

Juran and Gryna [8] define quality costs as costs incurred or occur in an effort to make, find, repair or avoid damage and deterioration in product quality. According to Supriyono [7] quality costs are costs associated with the creation, identification, repair, and prevention of damage.

3.4. Quality Supervisor (QSpv)

According to Soeharto [9], to carry out a project, one of the resources that determines its success is labor. According to Handoko [10], labor as a human resource has the following meanings:

1. Humans who work in the environment of an organization (also called personnel, workers, or employees).
2. Human potential as an activator of the organization in realizing its existence.
3. The potential that functions as capital (non-material/non-financial) within the organization, to realize the existence (existence) of the organization.

One of the workers who carry out the supervisory function of a construction company is a Quality Supervisor. The Quality Supervisor's labor inspection function is wider than the Quality Control workforce supervision function. Based on the book Role and Responsibility of Quality Supervisor issued by PT Total Bangun Persada [11], a Quality Supervisor has the duty to coordinate and ensure each stage of project work to achieve the quality target while taking into account time, cost, neatness and cleanliness, and safety and health work and environment.

3.5. Work Scope ofQuality Supervisor (QSpv)

In the book Role and Responsibility of Quality Supervisor by PT Total Bangun Persada [11], when performing its functions, there are at least 9 points of scope of work to be carried out by the Quality Supervisor from the beginning of the work until the work is completed, namely:

1. Quality control, stages carried out when work is being carried out. This is done so that the quality of work can be maintained, so as to reduce work errors.
2. Cost control, cost inspection phase, this inspection is carried out by using shop drawings with the suitability of the results done in the field, so that the volume of work results does not exceed the volume at the shop drawing.
3. Material control, routine stages that must be carried out by the Quality Supervisor before work begins. This is done to find out the stock of material in the warehouse, if the stock of material is used up, it can be immediately returned so that the work does not stop.
4. Process control, the coordination stage between the Quality Supervisor and the sub contractor during the work. Examination is carried out by using IK (work instructions) to ensure the work stages are in accordance with the agreed stages.
5. Man control, the stage of supervision of the amount of labor done every day before work begins.
6. Safety and environment control, stages of inspection in PPE (personal protective equipment), 2K (cleanliness and tidiness) of work areas and HSE conditions (occupational safety and health) every day before work begins.
7. Time control, the stage of the coordination meeting between the Quality Supervisor and the sub contractor regarding the project implementation schedule and targets to be achieved.
8. Machine control, stages of inspection of tools to be used by workers, and carried out regularly every day before work begins.
9. Working tools control, stages of inspection by the Quality Supervisor on the equipment used to do the work, if it is not appropriate (data is not feasible) then the worker cannot continue his work.

4. Research Methodology

4.1. Research Design

Research is the process of searching for things systematically for a long time using scientific methods and applicable rules. The word systematic means that research is related to the scientific method, which means that there is a process characterized by order and completeness [12]. In conducting research, one of the most

important things is to make a research design. Research design is a blue print of how data is collected, measured, and analyzed. Through research design, it can be assessed the allocation of needed resources [13].
The research begins with the selection of problems followed by a preliminary study with the intention to find information needed by researchers so that the problem becomes clear. The next step is to formulate a problem so that research can be carried out as well as possible, and clearly where to start. After formulating the problem, the research is continued by choosing the type of approach that will be used as a problem solving method.
Research is continued by determining research factors and research data sources, collecting and analyzing data. The analysis used in this study is a ranking analysis of relative importance index (RII), which is used to give values or ratings to factors and research variables based on the results of the questionnaire recapitulation. After analyzing the data, it is followed by drawing conclusions and preparing reports.

4.2. Research Location

This research was carried out on the Verde II Condominium Kuningan Jakarta property development project which was held on Jl. H. Cokong, Tebet Village, Setiabudi District, DKI Jakarta Province.

4.3. Sample and Population

The population in this study is the construction workforce at the Verde II Condominium Kuningan Jakarta project. Determination of samples is done by purposive sample method, where the researcher selects informants according to certain criteria that have been set. This criterion must be in accordance with the research topic. Those chosen must also be considered credible to answer research problems.
In this study, the initial sample of the study was 25 Quality Supervisors (QSpv), who were then re-selected to be 20 Quality Supervisors (QSpv) who were considered eligible to become research samples with the following considerations:

1. Minimum 2 years work experience in the Quality Supervisor field of work.
2. The final education qualification accordingly must be linear with the field of work
3. Field of expertise must be in accordance with the field of work.

For these considerations, there are 5 QSpv people who do not fulfill the requirements as research respondents, namely QSpv with work experience under 2 years and educational qualifications that are not in accordance with the field of work, so that they are considered not to have sufficient experience and knowledge in the field of Quality Supervisor.

4.4. Data Colletion Techniques

The technique or method of data collection is a method carried out by researchers to obtain the data needed in a study. Data is a collection of facts obtained from a measurement. A good decision making is the result of drawing conclusions based on accurate data or facts. In general, the data in this study are divided into two data sources, namely primary data sources and secondary data.

4.5. Factors and Variable of Research

Factors and variables of research are determined based on literature studies in the literature review chapter. The factors and research variables are shown in table 1 below.

Tabel 1: Factors and Variable of Research

Numb.	Factors	Var	Description of Varbale
1.	Quality Control	X1	Determination of clear goals, objectives and targets for quality achievement.
		X2	Determination of standards and criteria in meeting the goals, objectives and targets of quality achievement.
		X3	Designing information systems, monitoring, and outcome reports related to quality performance.
		X4	Review and analyze the results of work with predetermined standards and quality criteria.

		X5	Implementation of a quality assurance system for the owner.
		X6	Implementation of plan, do, check, action (PDCA) in the quality control process.
		X7	Corrective actions as early as possible against quality deviations.
		X8	Periodic and structured quality performance evaluation.
		X9	Identify opportunities and threats that may occur in the quality control process.
		X10	Prevention analysis and allocation of risk of quality deviations.
		X11	Use of technology in facilitating the quality control process.
		X12	A well-organized quality management system.
		X13	Objectivity in quality control and decision making.
		X14	Communication and coordination between fields.
2.	Cost Control	X15	Implementation of program evaluation and review technique (PERT).
		X16	Application of earned value methods as an instrument of cost control.
		X17	Identify risks and solutions to work cost deviations.
		X18	Periodic monitoring and evaluation of work cost performance.
		X19	Application of relevant technology in the process of controlling project costs.
		X20	Identification and analysis of cost overrun risk.
		X21	Assessment and analysis of work costs with predetermined standards, objectives and criteria.
		X22	Supervision of the balance of plans and implementation of costs.
		X23	Transparency in managing work costs.
		X24	The objectivity of decision making on the challenges of cost changes in the field.
3.	Material Control	X25	Applying appropriate material management.
		X26	Image clarity and material specifications.
		X27	Accuracy of estimated material costs.
		X28	Conditions for material purchase contracts.
		X29	Suitability of the procurement process includes a material delivery schedule.
		X30	Ability to resolve conflicts and dispute, and negotiations.
		X31	The accuracy of the material payment schedule.
		X32	Material cost evaluation and control system.
		X33	Ensure there are no changes in adverse material conditions during the shipping process.
		X34	Anticipate the risk of material shortages / losses.
		X35	Accuracy and accuracy in the handling process.
		X36	Optimizing company policies in purchasing (procurement strategy).
		X37	Reducing the level of material delivery costs deviations.
		X38	Increased supervision of material stock capacity at site locations.
		X39	Anticipatory actions against waste of material use.
		X40	Reducing the level of material damage during the storage process.
		X41	Increased supervision of material quality.

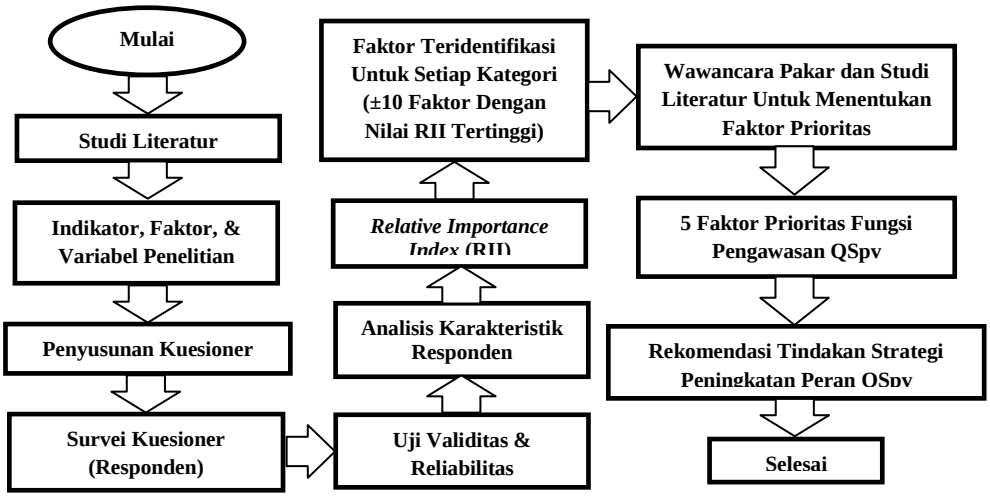
4.	Process Control	X42	The consistency of implementing project management is carried out effectively and efficiently.
		X43	Accuracy and obedience meet the method of implementation or the quality of work procedures.
		X44	Reduction of the level of job rework.
		X45	Determination of clear performance indicators in the implementation of monitoring and evaluation.
		X46	Routine briefing for all construction implementing elements regarding work procedures before commencing.
		X47	Identification of risks of technical and non-technical negligence that can affect product quality.
		X48	Memastikan seluruh unsur pelaksana konstruksi untuk menerima informasi yang detail mengenai prosedur pelaksanaan pekerjaan.
		X49	Ensure workers get information if there is a change in procedures for carrying out work.
		X50	Ensure availability of work facilities and supporting facilities prior to construction.
		X51	Ensure the legality of work as evidenced by implementation permits.
5.	Man Control	X52	Reduction of overtime time for workers to avoid fatigue.
		X53	Increased skills and competency of workers through training programs.
		X54	Settlement of conflicts and disputes.
		X55	Reward and award programs for outstanding workforce.
		X56	Placement of work position in accordance with his field of expertise.
		X57	There is good communication between workers and managerial parties (two-way communication).
		X58	Ensure workers are comfortable with the state of the work environment (safety equipment, cleanliness, lighting).
		X59	Ensure that the workforce does not carry out work outside their responsibilities.
		X60	Giving compensation for workers to be motivated to achieve.
		X61	Ensure that work breaks and worship schedules are carried out appropriately.
6.	Safety and Environment Control	X62	The company gives top priority to occupational health and safety environment (HSE) programs.
		X63	Regular socialization for workers in the HSE improvement program.
		X64	Improvement and supervision of the use of HSE equipment.
		X65	HSE rules and procedures are repaired periodically.
		X66	Guarantee for workers to receive detailed information about the HSE program.
		X67	Ensure workers obtain rights in terms of social security employment.
		X68	Involve labor in planning HSE programs.
		X69	Workers report in the event of an accident or a dangerous situation.
		X70	Ensuring HSE rules and procedures are easy to understand.

		X71	Granting sanctions for violating K3L procedures.
		X72	The K3L implementation is carried out consistently.
		X73	Application of hazard identification risk assessment and risk control (HIRARC) program.
		X74	Emergency action plan and work accident investigation program.
7.	Time Control	X75	Identify risks and solutions to work schedule deviations.
		X76	Periodic monitoring and evaluation of work scheduling performance.
		X77	Application of relevant technology in the process of controlling the project schedule.
		X78	Identification and analysis of work delay risks.
		X79	Assessment and analysis of work schedules with predetermined standards, objectives and criteria.
		X80	Supervision of suitability of plans and implementation of costs.
		X81	Detailed analysis of the relationship between project work, so that it is integrated with each other (master schedule).
		X82	Identify opportunities and challenges that might occur from job scheduling.
		X83	Application of network planning method as a time control instrument.
		X84	Prioritizing activities that have limits on activities with maximum resources, then scheduling these activities.
		X85	Prioritizing critical or near critical activities with the lowest total float, then scheduling these activities.
		X86	Prioritizing activities that have the shortest duration, then scheduling these activities.
8.	Machine Control	X87	Ensure the machine can work properly before the work is done.
		X88	Maximum and periodic maintenance of work machines.
		X89	Operator certification in operating the machine.
		X90	Increased machine productivity (heavy equipment).
		X91	Effectiveness of planning heavy equipment needs.
		X92	Optimization of operating costs for operating the machines used in the project.
		X93	Job security certainty for machine operators and heavy equipment.
		X94	The competence of machine operators or heavy equipment must be in accordance with their fields of work.
		X95	Proper planning in using machinery and heavy equipment to avoid waste (Excess quantity of goods used / imported).
		X96	Conduct a trial (trial) of the machine before the execution of the work.
		X97	Guarantee the feasibility of the functions of the machine and heavy equipment.
		X98	Activity scheduling is adjusted to resources and logical distribution patterns, so that the duration of the project does not exceed excessive limits.
		X99	Strive for the smallest idle time.
		X100	Inventory of spare parts to prevent work interruption.
		X101	The accuracy of machine placement so as not to interfere with

			other work or endanger workers.
		X102	Effective and efficient application of equipment management.
		X103	Inventory of work tools.
		X104	Proper storage of work tools to avoid loss and damage (storage system).
		X105	Optimizing maintenance of work tools used in the project.
9.	Working Tools Control	X106	Periodic evaluation and evaluation of the feasibility of work equipment.
		X107	Security assurance for workers in using work tools.
		X108	Ensure specifications of work tools in accordance with the conditions of work carried out.
		X109	Preventive maintenance by making the equipment in top condition and ready to use.
		X110	The company builds its own work equipment maintenance facilities.
		X111	Calibrate periodic work tools.

4.6. Research Analysis Method

Statistical data analysis was performed using the help of number processing computer programs and statistical data. The stages of analysis carried out in this study are shown in the following figure 1:



Gambar 1 Research Analysis Method

4.7. Analisis Relative Importance Index(RII)

Relative Importance Index (RII) analysis is an analysis that allows a relative quantitative, where the higher the rating (rating) the higher the influence given by the variables owned [14]. The formula used is:

$$\mathrm{RII} = \frac{\sum \mathrm{W}}{\mathrm{A \times N}}$$

Information:

RII = Relative Importance Index

W = Weight given for dominant causative factors (1,2,3,4 and 5)

A = The highest weight (in this study is 5)

N = Total number of respondents

In this study, the value of relative importance index (RII) is used to determine the priority factors of the Quality Supervisor's oversight function in improving project quality performance. Priority factors are determined from the highest rating of RII for each category of factors.

5. Data Analysis

5.1. Data Instrumen Test

Based on the validity and reliability of the data that has been done, the conclusion is obtained:

1. All variable items meet the requirements of data validity.
2. All variable items meet the requirements of data reliability.

5.2. Characteristics of Respondents

Analysis of respondent characteristics is an analysis of data processing used to provide an overview of the results of answers given by respondents to the questions in the questionnaire. The respondents chosen in this study were Quality Supervisors, which numbered 20 people. Respondents' characteristics were grouped according to gender, age group, work experience, recent education, and field of expertise. The data are explained in table 2 below:

Tabel 2: Characteristics of Respondents Percentage

Numb.	Characteristics of Respondents		Frequency	Percentage (%)
1.	Gender	Man	20	100
		Woman	0	0
2.	Age Group	< 20years old	0	0
		20-30years old	6	30
3.	Work Experience	< 10 years	10	50
		10-20 years	7	35
		20-30 years	3	15
		> 30 years	0	0
4.	Education	SLTA	4	20
		D3	1	5
		S1	15	75
		S2	0	0
		S3	0	0
5.	Areas of Expertise	Linear	15	75
		Non Linear	5	25

5.3. Relative Importance Index (RII)

Based on the analysis of relative importance index (RII), expert interviews, and literature studies, there were 5 priority factors of the Quality Supervisor's oversight function in improving quality performance as shown in table 3 below:

Table 3: Priority Factors

No.	Factor
1.	Determination of clear goals, objectives and targets for quality achievement.
2.	Anticipate the risk of material shortages / losses.
3.	The consistency of implementing project management is carried out effectively and efficiently.
4.	Ensure that all construction executors receive detailed information about the procedures for carrying out the work.
5.	Placement of work position in accordance with his field of expertise.

6. Conclusion and Recommendation

Based on the results of the research and discussion conducted, it was also found that 5 recommendations for action could be carried out by the Quality Supervisor (QSpv) in improving quality performance, namely:

- Establish the goals, objectives, and targets of quality achievement as performance guidelines to be achieved at the same time to measure the success or failure of the quality control program.
- Anticipating the risk of material shortages / losses can be done with inventory management.
- Making the project consistent in implementing project management and staying on the right track requires integration between 3 elements, namely systems, business processes, and organizations. Continuity between the three elements is the key to the quality value of a project that is maintained, so that the goals can be achieved.
- Applying two-way communication between leaders and subordinates in the delivery of information so that information can be received and well understood by all elements of the project implementers.
- The placement of workers in certain tasks and jobs must be adjusted to the field of expertise of the workers concerned. If it is not urgent, workers are not permitted to carry out multiple tasks which are not their expertise. But if forced to do double work, supervisors should choose workers who truly have the competence and expertise in the work unit to be carried out.

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