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# A FULL MEDIATION MODEL OF STAFF PERFORMANCE ON PROJECT SUCCESS IN ROAD SUPERVISION

*The object of research is the road supervision consultant teams operating in East Kalimantan (Indonesia). One of the most problematic areas is understanding the mechanism by which sub-professional staff performance influences project success via professional staff. Using an explanatory quantitative approach with survey data ( $n = 55$ ), regression with mediation testing (PROCESS Model 4) was employed. The results confirmed a full mediation model: Sub-professional performance significantly predicted professional performance ( $B = 1.0127$ ,  $p < 0.001$ ), and professional performance significantly predicted project success ( $B = 0.8377$ ,  $p < 0.001$ ). Crucially, the direct effect of sub-professional performance on project success became insignificant ( $p = 0.358$ ) when professional performance was included, while the indirect effect was substantial (Effect = 0.8483). This clarifies a key feature of project workflows: technical contributions must be transformed through managerial capabilities to impact outcomes. This allows for a clearer understanding beyond individual contributions. Compared to studies assessing factors in isolation, this offers a systemic view, highlighting the critical importance of the managerial layer (professional staff) in converting technical work into strategic success.*

**Keywords:** road supervision consultancy, construction project management, project success, mediation analysis, regression analysis, stratified sampling, Likert scale.

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## 1. Introduction

Road infrastructure development serves as the backbone of the economy, as it connects production centers to markets. Its success is commonly measured by three key parameters: cost, time, and quality. To ensure these three objectives are achieved, the role of supervision consultants becomes particularly critical in managing project execution in the field [1]. However, in practice, the performance of supervision consultants faces various challenges. In East Kalimantan, these challenges are amplified by a unique social context, where project workers come from diverse ethnic and cultural backgrounds. While this diversity has the potential to enrich the team, it can also introduce complexities in communication and coordination, ultimately affecting overall performance.

Structurally, the supervision consultant team consists of two main levels: professional staff, such as site engineers, who hold managerial control, and sub-professional staff, such as inspectors and surveyors, who handle technical execution. The performance of sub-professional staff in the field serves as the primary input, which is then collected, analyzed, and communicated by the professional staff to make strategic decisions [2]. This hierarchical relationship is central to project success, yet its mechanics are not fully understood.

Previous research highlights the varied performance of supervision consultants. For instance, one study affirms their vital role in ensuring project alignment with key parameters such as cost, quality, and time [3]. Other research has focused more specifically on quality control as the dominant influencing factor in the construction of public health facilities [4]. A construction project itself is an effort to develop infrastructure, typically involving civil engineering work [5]. In such projects,

supervision ensures that work aligns with design drawings and contract documents [6], aiming to meet quality, time, cost, and utility targets [7]. Performance can be defined as the periodic assessment of operational effectiveness based on predetermined standards [8]. Further studies confirm the importance of managerial competence, showing that leadership and teamwork significantly influence project success [9]. This is reinforced by findings that link organizational leadership directly to management performance in complex construction projects [10].

However, while these studies confirm the importance of supervision, questions related to the specific mechanism of how the technical performance of sub-professional staff is translated into overall project success through the managerial layer of professional staff remain less explored. An option for overcoming this limitation is to use mediation analysis, a statistical approach to understand how an independent variable influences a dependent variable through an intervening variable [11]. This study proposes a conceptual framework where the performance of professional staff functions as a mediating variable between the performance of sub-professional staff and overall project success.

Based on this framework, several hypotheses are proposed. First, there is a significant influence of sub-professional staff performance on professional staff performance (H1), as high sub-professional performance produces accurate data that enables professional staff to conduct project planning and control more effectively [12]. Second, there is a significant influence of professional staff performance on project success (H2), as the effective application of project management methodologies by managers significantly increases the likelihood of project success [13]. Third, there is a potential direct influence of sub-professional staff performance on project success (H3), as technical errors can directly lead to construction defects, rework, and cost overruns [14].

Finally, this study hypothesizes that the performance of Professional Staff significantly mediates the influence of sub-professional staff performance on project success (H4), a concept supported by studies showing that leadership style can mediate the relationship between team dynamics and project success [15].

Thus, *the aim of this research* is to quantitatively analyze the relationships among these performance levels, identify the most dominant factors, and formulate effective performance improvement strategies by testing the proposed mediation model.

To achieve the set aim, the following objectives must be completed:

- to identify the key performance indicators for sub-professional staff, professional staff, and project success based on a literature review;
- to analyze the direct and indirect effects of sub-professional and professional staff performance on project success using a mediation model;
- to formulate managerial recommendations based on the significance of the identified performance pathways.

## 2. Materials and Methods

The conceptual framework guiding this research is illustrated in Fig. 1.

*The object of research is the road supervision consultant teams among supervision consultant staff in road construction projects under the Public Works Department of East Kalimantan Province during the 2015 fiscal year.* Specifically, this study investigates the work system where the performance of sub-professional staff (e. g., inspectors, surveyors) acts as an input that is processed by professional staff (e. g., site engineers) to achieve overall project success, which is measured by cost, time, and quality accuracy.

This study is classified as descriptive and explanatory research using a survey method. A quantitative approach is employed to analyze the relationships among variables. Given the hierarchical human-resource structure and the need to measure perceptions across different staff levels, a cross-sectional survey was chosen as it allows for the efficient collection of individual-level indicators across the population of supervision consultants. Mediation analysis was selected to explicitly test the indirect effect of sub-professional performance on project success via professional staff, as the theoretical framework suggests a processing role for professional staff.

The research was conducted on road construction activities under the Public Works Department of East Kalimantan Province, using data from the 2015 fiscal year.

*Population:* the population of this study consists of individuals from both the contractor and the owner (Public Works Department) who were directly involved in the road construction project during the 2015 fiscal year, totaling 64 individuals. The population includes 18 individuals from the Public Works Department and 46 from the contractors.

*Sample:* the sample size was calculated using Slovin's formula. With a total population size ( $N_0$ ) of 64 supervision staff in the study area, and a margin of error ( $e$ ) of 0.05, the required sample size ( $n$ ) was determined to be 55 respondents. The calculation is shown in formula

$$n = \frac{N}{1 + Ne^2} = \frac{64}{1 + 64 \cdot (0.05)^2} = \frac{64}{1.16} \approx 55. \quad (1)$$

The research variables were operationalized into measurable indicators to be used in the questionnaire. These indicators were developed based on the job descriptions and responsibilities of supervision personnel, as outlined in field practice documents, as presented in Table 1.

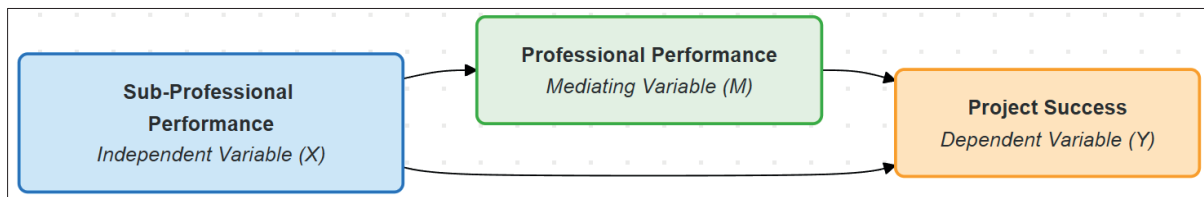


Fig. 1. Conceptual framework

Table 1

Definition of operational variables and indicators

Variable	Dimension	Indicator	Source
Professional performance (M)	Leadership	– Ability to coordinate the team to ensure smooth operations, quality, and timeliness. – Expertise in directing and supervising on-site engineering processes	[10]
	Compliance	– Accuracy in making recommendations for the acceptance/rejection of work and materials according to standards. – Precision in verifying monthly payment certificates based on progress	[10]
	Teamwork	– Ability to supervise the completion of as-built drawing preparation. – Effectiveness in socializing and evaluating the implementation of OHS programs	[10]
Subprofessional performance (X)	Technical execution	– (Inspector) Ability to supervise procedures and work quantities on site. – (Surveyor) Accuracy in conducting staking out and measurements based on design drawings	[16]
	Quality control	– (Material technician) Effectiveness in monitoring material and work quality testing. – (Material technician) Ability to analyze test results and job mix formula	[16]
	Reporting & administration	– (Inspector) Discipline in preparing informative daily reports. – (Surveyor) Accuracy in providing measurement data for payments	[16]
Project success (Y)	Project target achievement	– Cost accuracy. – Time accuracy. – Quality accuracy	[16]

Primary data were collected through a questionnaire using a 4-point Likert scale to avoid neutral responses. The scale used was: 1 = Strongly Disagree/Very Poor, 2 = Disagree/Poor, 3 = Agree/Good, and 4 = Strongly Agree/Very Good. Secondary data were obtained from literature reviews and relevant documents.

1. *Validity test*: the Pearson product-moment correlation was used to ensure that the instrument accurately measures what it is intended to measure. An item is considered valid if the calculated  $r$  value exceeds the critical  $r$  value at a 5% significance level.

2. *Reliability test*: the Cronbach's alpha method was used to ensure the internal consistency of the instrument. The instrument is considered reliable if the alpha coefficient value exceeds 0.6. The reliability test for the scales yielded Cronbach's alpha values of 0.78 for sub-professional performance (KSubpro), 0.81 for professional performance (KProfes), and 0.75 for project success, all exceeding the 0.6 threshold.

Data were processed using SPSS 15 for Windows. The analytical techniques employed are as follows:

1. *Factor analysis*: employed to reduce and group the independent variables ( $X_1$ – $X_9$ ) into several key factors with the most significant influence.

2. *Multiple linear regression analysis with mediation testing*: used to test the research hypotheses and determine the nature of both direct and indirect effects among variables.

3. *Classical assumption testing*: prior to performing regression analysis, tests for normality, non-multicollinearity, homoscedasticity, and non-autocorrelation were conducted to ensure the validity of the resulting regression model.

## 3. Results and Discussion

### 3.1. Data characteristics

#### 3.1.1. Respondent characteristics based on positions

This study successfully collected data from 55 respondents directly involved in road supervision projects in East Kalimantan. The respondent profiles were analyzed based on position, work experience, and the number of supervision projects previously handled, in order to provide an overview of the stakeholders' backgrounds. The distribution of respondents by position is presented in Table 2.

Table 2

Respondent characteristics based on positions

Positions	Frequency	Percentage (%)
Technical staff	19	34.5
Field supervisors	15	27.3
Field executor	8	14.5
Field coordinator	6	10.9
PPIO officers	4	7.3
General superintendent	3	5.5
Total	55	100

Table 2 shows that the majority of respondents are concentrated in two key positions: technical staff (34.5%) and field supervisors (27.3%). Collectively, these two groups represent 61.8% of the total sample, indicating that the primary data in this study largely originate from personnel directly involved in the daily technical execution and supervision in the field.

This composition is highly relevant and strategic to the research objectives, as the perceptions of these two groups directly reflect the daily workflow dynamics and information flow between sub-professional and professional staff, at the core of the mediation model being tested. Their involvement provides in-depth insights into how operational tasks such

as inspections, measurements, and testing are received and processed at the managerial level.

In addition, the participation of managerial-level personnel (such as field coordinators (10.9%), physical project implementing officers (PPIO) from the owner's side (7.3%), and general superintendents from the contractor's side (5.5%)) ensures that the evaluation of the project success variable encompasses not only operational aspects but also strategic perspectives and final outcomes. This representation across hierarchical levels enriches the analysis and enables more holistic conclusions regarding the overall project work system.

#### 3.1.2. Descriptive statistics of research variables

Descriptive statistics for each research variable, including the calculated mean scores, are presented in Table 3.

Table 3

Descriptive statistics

Variable	N	Mean	Standard deviation
Sub-professional performance (KSubpro)	55	3.1576	0.597
Professional performance (KProfes)	55	3.203	0.6134
Project success (KProject)	55	3.2424	0.6101

Table 3 shows that the mean scores for all three variables are above 3.1 on a 4-point scale, indicating that respondents generally hold positive perceptions. The project success variable (KProject) has the highest mean score (3.2424), while the sub-professional performance variable (KSubpro) has the lowest score (3.1576). The relatively low standard deviation values for all three variables suggest that the data distribution is homogeneous.

Although the majority of respondents in this study have less than five years of work experience, the descriptive statistics indicate that perceptions of both sub-professional and professional staff performance remain in the high category (mean > 3.15 on a 4-point scale). This finding suggests that the work system within road supervision projects in East Kalimantan has successfully accommodated and functionally optimized the contributions of junior human resources. It reflects the effectiveness of multilevel information flow and decision-making mechanisms, whereby technical input from sub-professional staff is efficiently capitalized on by professional staff through responsive coordination systems and organizational structures. Moreover, the high-performance perceptions among early-career employees also indicate that factors such as workflow digitalization, adaptive work culture, and the application of technical-transactional leadership styles may have contributed to enhanced individual and team performance. Therefore, these descriptive findings not only serve as preliminary validation of the mediation model tested in this study, but also reinforce the importance of developing organizational capabilities based on team structure and information integration in the context of dynamic and complex construction projects.

### 3.2. Mediation regression analysis

#### 3.2.1. Hypothesis 1 testing

Hypothesis 1 (H1) states that there is a significant influence of sub-professional staff performance (KSubpro) on professional staff performance (KProfes).

$H_0: \beta_1 = 0$  (sub-professional staff performance has no significant effect on professional staff performance).

$H_1: \beta_1 \neq 0$  (sub-professional staff performance has a significant effect on professional staff performance).

A significance level ( $\alpha$ ) of 0.05 was used. The regression test results for H1 are presented in Table 4.

**Table 4**

## Hypothesis 1 testing

Variable	Coefficient ( <i>B</i> )	<i>t</i>	<i>p</i> -value	Model fit: <i>R</i> <sup>2</sup>
Kinerja subprofessional (KSubpro)	1.0127	42.555	< 0.001	0.9716

Based on Table 4, the *p*-value is less than 0.001, which is smaller than the significance level  $\alpha = 0.05$ . Therefore,  $H_0$  is rejected, indicating that sub-professional staff performance has a positive and significant effect on professional staff performance. This reflects a high degree of vertical dependency within the project supervision work structure, where the effectiveness of managerial decision-making at the professional level is heavily influenced by the reliability of technical data and field observations compiled by sub-professional teams such as inspectors, surveyors, and material technicians.

This condition indicates that professional staff serve as the central nodes within the project's information system, processing inputs from operational lines into technical policies, engineering recommendations, and reports for stakeholders. If the quality of inputs is compromised, such as through inaccurate data, delayed reporting, or miscommunication, the effectiveness of professional staff's managerial roles will be directly affected. Therefore, this relationship is not merely statistical but also reflects a critical interdependence within the project supervision work system. These findings highlight the importance of designing an internal quality management system that ensures the reliability of information flow across staff levels, as well as the need to strengthen technical and procedural training for sub-professional staff to maintain the overall integrity of technical decision-making processes.

### 3.2.2. Hypothesis 2 and 3 testing

Hypothesis 2 (H2) tests the effect of professional staff performance (KProfes) on project success (KProject), while hypothesis 3 (H3) examines the effect of sub-professional staff performance (KSubpro) on project success (KProject) within the mediation model. The test results are presented in Table 5.

**Table 5**

## Hypothesis 2 and 3 testing

Variable	Coefficient ( <i>B</i> )	<i>t</i>	<i>p</i> -value	Model fit: <i>R</i> <sup>2</sup>
Professional performance (KProfes)	0.8377	5.496	< 0.001	0.9653
Subprofessional performance (KSubpro)	0.1452	0.927	0.358	

Table 5 shows that for the professional staff performance (KProfes) variable, the *p*-value is less than 0.001, which is smaller than  $\alpha = 0.05$ . Therefore,  $H_0$  is rejected, indicating that professional staff performance has a positive and significant effect on project success. Project success is highly dependent on the ability of professional staff to integrate field data into technical decisions that directly impact project quality, timeline, and safety. This highlights the central role of the site engineer in translating data into actionable decisions.

The test of hypothesis 3 (H3) indicates that sub-professional staff performance (KSubpro) does not have a significant direct effect on project success when the professional staff performance variable is included in the model (*p*-value = 0.358). This means that the contributions of sub-professional staff to technical processes, such as inspection, measurement, and field documentation, do not independently determine project success without being processed and acted upon by professional staff. This finding provides strong evidence for the presence of a mediation effect within the project workflow system, where the impact of sub-professional work on project outcomes is substantially

transformed through higher managerial layers. From an organizational engineering perspective, this suggests that road supervision projects operate within a tiered decision system, in which technical contributions from the field only have a significant impact when effectively managed at the professional level.

Thus, the results of testing hypotheses 2 and 3 not only strengthen the validity of the proposed conceptual model structure but also provide important implications for the design of project work systems. Efforts to improve project success should focus on optimizing the functions of professional staff, including training in decision-making, risk management, and technical leadership, while also reinforcing the input systems from sub-professional staff as an integral foundation in the project's information cycle.

### 3.2.3. Hypothesis 4 testing

Hypothesis 4 (H4) tests whether professional staff performance (KProfes) significantly mediates the relationship between sub-professional staff performance (KSubpro) and project success (KProject). The results of the mediation (indirect effect) test are presented in Table 6.

**Table 6**

## Indirect effect test results (mediation effect)

Effect	Effect value ( <i>B</i> )	Lower bound CI (95%)	Upper bound CI (95%)
Indirect effect	0.8483	0.496	1.0774

Conceptually, these results confirm that within the construction project supervision system, the operational contributions of sub-professional staff (inspectors, surveyors, material technicians) cannot directly influence final project performance without being processed, interpreted, and strategically converted by professional staff. Professional staff act as both technical translators and decision integrators, transforming raw information into tactical decisions that impact quality, time, cost, and safety aspects. This dependency highlights how a hierarchical and functional organizational structure plays a critical role in determining the effectiveness of project team performance.

These findings provide important empirical evidence that system efficiency is determined not only by the individual strengths at each organizational level, but also by the effectiveness of inter-level relationships, particularly in how technical information is consolidated and utilized. In other words, optimizing project success requires strong synergy between field technical executors and technical decision-makers, which can only be achieved through a structured, data-driven performance management and communication system. The practical implication of this finding is that strategies for improving project performance should focus on strengthening the capabilities of professional staff in managing and converting technical data into strategic decisions, as well as enhancing the quality of input from sub-professional staff to ensure the reliability of information entering the managerial process.

### 3.3. Comparison with prior studies and justification of novelty

The high coefficient of determination ( $R^2$ ) of 0.9716 for the model where professional performance is regressed on sub-professional performance (KProfes ~ KSubpro) indicates an exceptionally strong predictive relationship. This suggests that nearly all the variance in professional staff performance can be explained by the performance of their sub-professional counterparts within this specific project context.

When comparing these findings with existing literature, the identified full mediation effect represents a significant contribution. For instance, while Aga, Noorderhaven, & Vallejo (2016) reported a partial mediation effect of team-building on the relationship between leadership and project success (for indirect effect  $\beta \approx 0.19$ ), the current study found a substantial indirect effect of sub-professional performance on project success (*Effect* = 0.8483).



This stronger, full mediation effect in the East Kalimantan context may be attributed to the highly structured and hierarchical nature of road supervision projects, where information and workflow are strictly channeled upwards, making the mediating role of professional staff not just influential but essential. This finding empirically solidifies the theoretical assumption that the managerial layer acts as a critical transformer of technical inputs into strategic project outcomes.

### 3.4. Implication of findings

The results of this analysis offer several important implications, both from a managerial perspective and within the socio-cultural context of the research location.

1. *Multicultural context of East Kalimantan*: the finding of full mediation becomes even more relevant within the multicultural context of East Kalimantan. Informal discussions with respondents indicated that language and cultural differences sometimes affect communication among team members. For example, site engineers and occupational health and safety (OHS) specialists need to possess cross-cultural communication skills to effectively understand and convey information to field staff from diverse backgrounds. The mediating role of professional staff is thus not only technical but also social, serving as a communication bridge to ensure that all team members, regardless of their backgrounds, work toward a shared goal.

2. *Managerial implications*: this finding highlights the need for a holistic human resource management approach, where training focuses not only on individual technical competencies but also on fostering synergy across staff levels. Improving sub-professional performance alone is insufficient; effective managerial mechanisms must be in place to translate such performance into project success. The following practical interventions are recommended:

- Conducting joint workshops between surveyors and site engineers to align technical perspectives and simplify reporting workflows.
- Providing leadership and cross-cultural communication training for professional staff to enhance their effectiveness in managing heterogeneous teams.
- Establishing a structured feedback system from sub-professional to professional staff to ensure that field issues are quickly identified and resolved.

*Practical Value*: the findings confirm that project success is not merely an accumulation of individual technical tasks, but a result of an effective transformation of technical inputs into strategic decisions. The practical value lies in shifting human resource development focus from mere technical training for sub-professional staff to enhancing the managerial, communication, and leadership capabilities of professional staff. Recommended interventions include joint workshops to align technical-managerial perspectives, cross-cultural communication training for managers in diverse environments like East Kalimantan, and establishing structured feedback systems. These actions can create a more synergistic and efficient project supervision system.

*Research Limitations*: this research has several limitations that should be acknowledged. First, the data were collected from a single fiscal year (2015), which may not capture longitudinal performance trends or the effects of policy changes over time. Second, the research was conducted within a specific geographical and cultural context (East Kalimantan), which may limit the generalizability of the findings to other regions with different work cultures or project complexities. Third, this research relied on quantitative survey data, which captures perceptions of performance but does not delve into the qualitative nuances of daily interactions and decision-making processes.

*Prospects for Further Research*: future research could build upon these findings in several ways. A longitudinal study could track project teams over multiple years to analyze how performance dynamics evolve. Comparative studies across different provinces or countries could test the validity of the mediation model in various socio-cultural contexts.

Furthermore, a mixed-methods approach incorporating qualitative interviews and case studies would provide deeper insights into the specific communication barriers and enablers that influence the effectiveness of the professional staff's mediating role. Investigating other potential mediating variables, such as organizational culture or technology adoption, could also offer a more comprehensive understanding of project success factors.

### 4. Conclusions

1. Regarding the identification of performance indicators, the study successfully operationalized variables for sub-professional performance (technical execution, quality control, reporting), professional performance (leadership, compliance, teamwork), and project success (cost, time, quality accuracy) based on established literature.

2. Regarding the analysis of performance effects, the mediation model revealed a clear pathway of influence. Sub-professional staff performance has a strong, significant positive effect on professional staff performance ( $B = 1.0127, p < 0.001$ ). In turn, professional staff performance is a significant positive predictor of project success ( $B = 0.8377, p < 0.001$ ). Crucially, the model confirmed a full mediation, as the direct effect of sub-professional performance on project success becomes insignificant ( $p = 0.358$ ) when professional performance is included as a mediator.

3. Regarding the formulation of managerial recommendations, the findings lead to the recommendation that strategies should focus on enhancing the capabilities of professional staff. This includes improving their ability to manage, interpret, and convert technical field data into effective strategic decisions, thereby strengthening the synergy between staff levels to optimize overall project success.

### Conflict of interest

The authors declare that they have no conflict of interest in relation to this research, including financial, personal, authorship or other, which could affect the research and its results presented in this article.

### Financing

The research was performed without financial support.

### Data availability

The manuscript has no linked data.

### Use of artificial intelligence

The authors confirm that they did not use artificial intelligence technologies when creating the presented work.

### References

1. Simbolon, R., Sutanto, H. (2025). Konsultan pengawas sebagai pengontrol mutu, waktu dan biaya pada pelaksanaan pembangunan jalan nasional. *Jurnal Teknologi Sipil*, 9 (1), 70–77. Available at: <https://e-journals.unmul.ac.id/index.php/TS/article/view/19891>
2. Saputra, A. A. I., Kadar Yanti, R. M., Wiguna, I. P. A., Nurcahyo, C. B. (2017). Pengaruh Komunikasi Terhadap Keberhasilan Proyek Pada Hubungan Kerja Antara Kontraktor dan Subkontraktor. *JST (Jurnal Sains Terapan)*, 3 (2). <https://doi.org/10.32487/jst.v3i2.265>
3. Dwiretnani, A., Dony, W., Manalu, F. A. (2024). Analisis Kinerja Konsultan Pengawas Dalam Pelaksanaan Proyek Konstruksi. *Jurnal Civronlit Unbari*, 9 (1), 1. <https://doi.org/10.33087/civronlitv9i1.112>
4. Putra, I. K. A. A., Pagehgiri, J., Ariyanta, I. P. G. (2021). Analisis kinerja konsultan pengawas konstruksi dalam pelaksanaan proyek gedung puskesmas di kabupaten Tabanan. *Jurnal Teknik Gradien*, 13 (1), 48–60. <https://doi.org/10.47329/teknikgradien.v13i1.741>

5. Kresna (2019). *Pengertian Proyek Konstruksi*. [Skripsi dan tesis]. Available at: <https://konsultasiskripsi.com/2019/01/17/pengertian-proyek-konstruksi-skripsi-dan-tesis/>
6. Rasul, R. F., Hudori, M. (2021). Pelaksanaan Pengawasan Proyek Peningkatan Ruas Jalan Simpang Marina – Simpang Base Camp Kota Batam. *Conference on Community Engagement Project*, 1 (1), 75–79. Available at: <https://journal.uib.ac.id/index.php/concept/article/download/4614/1323>
7. Muazzin, M. T. (2021). *Pemahaman umum dan pengendalian pekerjaan konstruksi*. Jakarta: PUPR. Available at: [https://sibangkoman.pu.go.id/center/pelatihan/uploads/edok/2022/10/71f27\\_MODULE\\_02\\_PPK\\_-\\_PEMAHAMAN\\_UMUM\\_DAN\\_PENGENDALIAN\\_PKERJAAN\\_KONSTRUKSI.pdf](https://sibangkoman.pu.go.id/center/pelatihan/uploads/edok/2022/10/71f27_MODULE_02_PPK_-_PEMAHAMAN_UMUM_DAN_PENGENDALIAN_PKERJAAN_KONSTRUKSI.pdf)
8. Yohanes, Y., Wellem, I. (2023). Peran Suatu Analisis Kinerja Dalam Organisasi Dengan Menggunakan Pendekatan. *Jurnal Projemmen UNIPA*, 10 (2), 37–55. <https://doi.org/10.59603/projemmen.v10i2.28>
9. Ali, H., Chuanmin, S., Ahmed, M., Mahmood, A., Khayyam, M., Tikhomirova, A. (2021). Transformational Leadership and Project Success: Serial Mediation of Team-Building and Teamwork. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.689311>
10. Luo, L., Yang, Y., Wu, G., Zheng, J., Liu, D. (2023). Effects of Organizational Leadership on Project Citizenship Behavior and Management Performance in Complex Construction Projects. *Buildings*, 13 (1), 259. <https://doi.org/10.3390/buildings13010259>
11. Hayes, A. F. (2022). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. The Guilford Press, 732. Available at: [https://www.guilford.com/books/Introduction-to-Mediation-Moderation-and-Conditional-Process-Analysis/Andrew-Hayes/9781462549030?srsltid=AfmBOoo6vbyWthqkysKp\\_j7PL4Nyq1rZqLkk2cRT14i0chgEMcmEtEJa\\_](https://www.guilford.com/books/Introduction-to-Mediation-Moderation-and-Conditional-Process-Analysis/Andrew-Hayes/9781462549030?srsltid=AfmBOoo6vbyWthqkysKp_j7PL4Nyq1rZqLkk2cRT14i0chgEMcmEtEJa_)
12. Shahzad, M., Qu, Y., Zafar, A. U., Rehman, S. U., Islam, T. (2020). Exploring the influence of knowledge management process on corporate sustainable performance through green innovation. *Journal of Knowledge Management*, 24 (9), 2079–2106. <https://doi.org/10.1108/jkm-11-2019-0624>
13. Joslin, R., Müller, R. (2016). The impact of project methodologies on project success in different project environments. *International Journal of Managing Projects in Business*, 9 (2), 364–388. <https://doi.org/10.1108/ijmpb-03-2015-0025>
14. Olowolayemo, O. E., Williams, S. O., Adeniji, O. O., Olotu, F. M., Oyegoke, I. K. (2024). Design error: Its effects on building projects delivery period. *International Journal of Science and Research Archive*, 12 (1), 2376–2380. <https://doi.org/10.30574/ijrsra.2024.12.1.1039>
15. Aga, D. A., Noorderhaven, N., Vallejo, B. (2016). Transformational leadership and project success: The mediating role of team-building. *International Journal of Project Management*, 34 (5), 806–818. <https://doi.org/10.1016/j.ijproman.2016.02.012>
16. Kumar, V., Pandey, A., Singh, R. (2023). Project success and critical success factors of construction projects: project practitioners' perspectives. *Organization, Technology and Management in Construction: An International Journal*, 15 (1), 1–22. <https://doi.org/10.2478/otmcj-2023-0001>

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