

WORK COORDINATION AND SOP CLARITY AS DRIVERS OF EMPLOYEE PERFORMANCE IN THE CONSTRUCTION INDUSTRY: THE MEDIATING ROLE OF WORK EFFECTIVENESS AND THE MODERATING ROLE OF SUPERVISORY CONTROL

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Abstract

This study developed an integrated model to explain how work coordination and clarity of standard operating procedures affect employee performance through work effectiveness and the role of work supervision as a moderator in the construction industry. The study used an explanatory quantitative approach with a cross-sectional survey design. Data were obtained from 150 employees of construction companies in the Jakarta, Bogor, Depok, Tangerang, and Bekasi areas through purposive sampling, then analyzed using Partial Least Squares Structural Equation Modeling. The results showed that work coordination did not have a direct effect on employee performance, but had a positive effect on work effectiveness. The clarity of SOPs had a positive effect on work effectiveness and employee performance, while work effectiveness significantly improved performance. The mediation analysis identified indirect-only mediation on the relationship between coordination and performance, and complementary partial mediation on the relationship between SOP clarity and performance. Work supervision has been proven to strengthen the influence of coordination and SOP clarity on employee performance. These findings confirm that coordination does not automatically result in performance, but must be converted into an effective work process supported by consistent supervision. This research offers a theoretical contribution through the integration of mediation and moderation mechanisms and provides practical implications for construction companies to manage coordination, SOPs, effectiveness, and supervision as a complementary performance improvement system.

Keywords: Work Coordination; Clarity of SOPs; Work Effectiveness; Work Supervision; Employee Performance; Construction Industry

INTRODUCTION

The construction industry occupies a strategic position in economic development because it connects investment, job creation, and the provision of productive infrastructure. In Indonesia, this sector contributed 10.43% to gross domestic product in the fourth quarter of 2024 and is the fourth largest contributor to the national economic structure (BPS, 2025). This scale makes construction workforce productivity no longer seen as an internal operational issue, but as a capability that determines the accuracy of project completion and the company's competitiveness (Nor Hamzah et al., 2024). At the same time, digital transformation is changing the division of tasks, information flow, and competency needs, so that the value of technology depends on the readiness of human resources and the integration of work systems (ILO, 2022). Thus, human resource management that is able to integrate humans, procedures, and technology is a prerequisite for the sustainable performance of construction organizations (Maliha et al., 2025).

The project-based character makes the construction industry particularly vulnerable to work fragmentation. Each project brings together owners, contractors, consultants, suppliers, supervisors, and field workers in a relationship of high dependency (Youssef et al., 2023), but often with objectives, technical language, and information systems that are not entirely uniform. In this configuration, delays in information or decisions on one part can trigger rework, conflicts, wasted resources, and schedule deviations on the other (Tariq & Gardezi, 2023). Empirical evidence shows that low labor productivity and weak coordination between parties are among the main causes of delays, while conflicts and communication disruptions magnify the consequences of cost and time (Mahamid, 2022). Therefore, coordination is not just an administrative activity, but an integration mechanism that maintains the continuity of the project's workflow (Chi et al., 2021).

Such business pressures are amplified by the demands of quality, safety, and accountability. Construction companies must ensure that work is carried out consistently in changing field conditions, involves workers with diverse levels of experience, and faces high operational risks (Zhu et al., 2024). Clear SOPs are needed to translate standards into action sequences, while oversight is needed to detect deviations and provide corrective feedback (Wu et al., 2024). However, standardization that is not accompanied by communication and supervision can stop as documentary compliance without resulting in behavioral change (Lyu et al., 2025). Recent research shows that the integration of SOPs with information systems improves process traceability, performance measurement helps identify inefficiencies, and supervisor communication shapes worker knowledge, motivation, and behavior. Thus, the clarity of SOPs and the quality of supervision are managerial capabilities that have the potential to determine the effectiveness and performance of employees (Ahmad et al., 2025).

The empirical literature of the last five years shows that work coordination is an important determinant of the output of construction teams and organizations. Internal communication models in construction companies find that the quality of content, channels, and communication relationships is related to organizational effectiveness (Chi et al., 2021). Research on project teams also shows that relational coordination, interpersonal trust, and collective confidence increase resilience and problem-solving abilities when projects face pressure (Carmeli et al., 2021). On the other hand, teams that are physically or digitally dispersed face obstacles in the form of response delays, weak trust, role ambiguity, and technology gaps (Youssef et al., 2023). The findings show that coordination affects performance through its ability to align information and actions, not just through the intensity of communication (Pavez et al., 2021).

On the procedural dimension, empirical evidence shows that the existence of SOPs does not automatically guarantee consistency of performance. SOPs become effective when their content is easy to understand, relevant to working conditions, contains a division of responsibilities, and is connected to monitoring mechanisms (Zhu et al., 2024). Technology-based SOP frameworks on construction material management, for example, improve traceability, information accuracy, and resource efficiency (Ahmad et al., 2025). In contrast, design errors, rework, instruction changes, and weak process control are associated with decreased productivity and delays (Mahamid, 2022). Therefore, the main issue is not whether the company has SOPs, but whether SOPs have sufficient operational clarity to reduce ambiguity and variation in implementation in the field (Tariq & Gardezi, 2023)

Work effectiveness further describes the distance between the availability of organizational inputs and the achievement of performance. Smooth coordination and clear SOPs can reduce wait times, duplication, task conflicts, and the need for corrections; these benefits allow employees to complete work on time with more efficient use of resources (Mahamid, 2022). A study of human resources in the architecture, engineering, and construction industries shows that workforce planning, development, and monitoring practices contribute to performance through improvement of work processes (Maliha et al., 2025). The construction team literature also places the psychosocial environment, collaboration, and adaptability as the foundations of effectiveness (Nor Hamzah et al., 2024). Meanwhile, the strong relationship between labor productivity and project delays confirms that process effectiveness is a substantive pathway to work outcomes. The evidence supports the placement of work effectiveness as a mediator, rather than just an additional independent variable (Nor Hamzah et al., 2024).

The empirical phenomenon regarding supervision shows a more complex pattern than uniform direct influence. Supervisory leadership can increase worker compliance and participation, but the power of its influence depends on social conditions as well as psychological mechanisms within the team (Wu et al., 2024). Other studies have found that supervision, peer support, and coaching influence behavior through attitudes, subjective norms, and perceptions of control (Man et al., 2025). Safety communication from supervisors also increases workers' knowledge, self-efficacy, motivation, and sense of ownership of safety. This means that supervision that is oriented towards direction, evaluation, and feedback can strengthen the conversion of work effectiveness into performance; conversely, inconsistent or purely coercive supervision can undermine the benefits of the work system that has been built (Zhu et al., 2024).

Although recent studies have broadened the understanding of the determinants of the success of construction work, the knowledge base is still dispersed by theme and level of analysis. The communication and coordination literature mainly describes information flow, collaboration between parties, and the performance of teams or projects; review (Abd Aziz et al., 2022), for example, mapping issues of accuracy, timeliness, distortions, barriers, and misunderstandings of communication, while (Nor Hamzah et al., 2024) grouping the determinants of the construction team's performance into psychosocial and physical work environments. Another clump places delays and labor productivity as the main outputs; (Mahamid, 2022) shows that low productivity and poor coordination between parties are important factors in project delays, while Qi et al., (2024) confirms the dominance of the productivity approach in the construction labor literature. At the same time, the latest supervision studies are more directed at climate and safety behavior. Hu et al., (2025) even assessed that the interaction of mechanisms at the organizational and individual levels still needs to be clarified. Thus, there have not been many studies that have tested work coordination, SOP clarity, work effectiveness, and individual performance in one integrated

explanation model. This gap is important because the success of a project or team is not identical to the performance of each employee, so the micro-mechanisms that link work governance to individual outputs have not yet been adequately explained.

The second gap is causal-mechanistic. Coordination and SOPs are often positioned as direct predictors of performance, even though the existence of formal communication or procedures does not in itself guarantee that work takes place precisely, quickly, and resource-efficiently. SOPs only produce benefits if their content is understood, relevant to field conditions, communicated consistently, and translated into work routines. Therefore, work effectiveness deserves to be placed as a mediator that explains the process of transformation from coordination and clarity of SOPs to employee performance. This argument is in line with the recent findings that the influence of social and managerial factors works through intermediate mechanisms. (Lyu et al., 2025), for example, showing that safety communication from supervisors and co-workers influences worker behavior through knowledge efficacy, safety motivation, and psychological belonging; the influence of supervisor communication also weakens as work pressure increases. Man et al., (2025) found that safety supervision has no direct effect on behavioral intent, but works indirectly through attitudes, subjective norms, and perceived behavioral control. Recent evidence from Cao et al., (2026) It also shows that abusive supervision decreases the work efficiency of construction workers through impaired cognitive conditions. The findings reinforce the suspicion that the influence of supervision is contextual and not always linear. However, the role of work supervision as a special moderator on the work-performance effectiveness relationship of employees has not been the main focus of these studies. Therefore, testing of work effectiveness mediation and supervision moderation is needed to answer two questions at once: through what processes coordination and clarity of SOPs improve performance, and at what level of supervision is work effectiveness most strongly translated into employee performance.

The third gap relates to institutional and geographical contexts. Some of the latest empirical evidence comes from Saudi Arabia, Malaysia, South Africa, China, and Hong Kong, which have different project structures, employment systems, communication cultures, supervisory practices, and digital maturity than Indonesia. This limited transferability is increasingly relevant because the construction industry is a strategic and labor-intensive sector in Indonesia. Central Statistics Agency, (2025) noted that construction contributed around 9.84% to Indonesia's GDP in the first quarter of 2025 and became the fourth largest sector in the national economy. At the same time, the character of Greater Jakarta construction projects is characterized by project density, the involvement of many organizations, subcontract chains, labor mobility, and high completion demands. The construction HRM literature in developing countries also still shows limited empirical evidence and the tendency to use informal HR management procedures; Chapano & Iwu, (2025) confirms the gap between HRM studies and construction multiproject environments and the need for contextual evidence to optimize performance. Therefore, the study in Greater Jakarta not only tests the applicability of cross-border findings, but also expands micro-explanations of how work governance affects individual performance in Indonesia's project environment.

The novelty of the model lies in the integrated testing of the two types of relational work infrastructure through coordination and formal through SOP clarity that is expected to improve performance through work effectiveness. Previous literature tends to test role clarity, communication, monitoring, or job performance separately so that the common mechanism in the context of construction has not been adequately explained. This model also does not assume that automatic effectiveness produces performance, but rather tests supervision as a boundary condition

that can strengthen the conversion process (Lyu et al., 2025). Conditional indirect effect testing further contributes to more precision by showing when and through what mechanisms coordination and SOP clarity result in employee performance.

Departing from these three gaps, this study develops a moderated mediation model that places work coordination and SOP clarity as antecedent variables, work effectiveness as a mediation mechanism, and work supervision as a boundary condition in the relationship between work effectiveness and employee performance. Theoretically, this model connects the perspectives of coordination, process standardization, and managerial control in one employee-oriented architecture. The model also shifts attention from the question of whether coordination and SOPs affect performance to a more explanatory question, namely how the influence takes place and under what conditions it strengthens or weakens. Practically, the results of the study can help construction companies determine more precise intervention points: improve communication and coordination architecture, simplify and clarify SOPs, improve the effectiveness of work implementation, or improve the quality of supervision. Thus, this study aims to analyze the influence of work coordination and SOP clarity on employee performance through work effectiveness, as well as test work supervision as a moderator of the relationship between work effectiveness and employee performance in the construction industry in Greater Jakarta.

REVIEW OF LITERATURE

Theoretical Foundations and Model Architecture

This research model combines the perspective of job demands resources (JD R), role clarity, and organizational control mechanisms to explain how work infrastructure translates into individual performance. In the JD R perspective, coordination, procedural information, and supervisory support serve as work resources that help employees manage project demands, maintain engagement, and achieve work outcomes (Li et al., 2024). Role clarity also reduces uncertainty regarding priorities, responsibility boundaries, and output standards so that cognitive energy can be diverted from task interpretation to task execution (Zettina et al., 2025). Recent empirical evidence suggests that role clarity is positively related to employee performance and further contributes to organizational effectiveness (Asamani et al., 2025).

Construction projects, dependencies between work packages make an employee's performance inexplicable by individual abilities alone. Timely exchange of information and alignment of actions are necessary for design, procurement, execution, and quality control work to form a consistent workflow (Ma et al., 2025). Clear SOPs complement coordination by establishing sequences, responsibilities, control points, and criteria for accepting work so that variations in processes that are not value-added can be suppressed (Rifa & Diandra, 2026). Supervision then functions as a feedback mechanism that ensures that coordinating and procedural resources are truly converted into actions that are on target (Zhang et al., 2023).

Work Coordination

Work coordination is defined as the process of aligning information, decisions, time, and contributions between individuals or between units that have a task dependency to achieve a common goal. In a project context, coordination is not just the frequency of communication, but the quality of the integration of actions that allows team members to know what to do, when work should be handed over, and to whom problems should be escalated (Ma et al., 2025). Teamwork quality places communication, coordination, balance of contributions, mutual support, effort, and cohesion as complementary elements in collective work (Al-Hajj et al., 2025). Thus, work

coordination is positioned as a relational-operational capability that reduces fragmentation and maintains the continuity of the construction process.

Work coordination in this study is measured through four observable dimensions. The first dimension is the quality of communication, namely accuracy, openness, and relevance of work information (Satoinong, 2024). The second dimension is the synchronization of time and activity, namely the suitability of sequences, schedules, and the handover of work between sections. The third dimension is the clarity of the division of roles and contributions, namely an understanding of the task owner, the limits of authority, and the expected output (Zettna et al., 2025). The fourth dimension is problem-solving and mutual support, i.e. the ability of work units to respond to change and resolve cross-functional barriers collaboratively.

Coordination provides visibility into the status of the work, dependencies, and changes that must be responded to so that wait times and conflicts between tasks can be reduced. The quality of teamwork also allows member contributions to be balanced and issues resolved before they develop into delays or rework. In fragmented construction projects, effective communication helps maintain consistency between project objectives and operational decisions (Satoinong, 2024). Based on this argument, the stronger the work coordination, the higher the ability of employees to achieve goals on time and efficiently.

H1: Work coordination has a positive effect on work effectiveness.

Clarity of Standard Operating Procedures

SOP clarity refers to the degree to which formal guidelines convey the work sequence, person in charge, quality standards, decision points, and corrective actions in a specific manner and are easily interpreted by the implementer. Substantively, clear SOPs minimize role ambiguity because employees obtain stable references to determine the correct course of action in routine and deviant situations (Lan et al., 2025). Role clarity resulting from adequate work information improves employees' ability to direct behaviors toward goals and reduces the psychological burden of uncertainty (Asamani et al., 2025). In a project-based organization, these functions are important because changes in personnel and the complexity of work interfaces can lead to differences in interpretation of the implementation method.

The construct of SOP clarity is operationalized through five dimensions. Specificity explains the firmness of the sequence of steps, process owners, authority limits, and outcome criteria (Rifa & Diandra, 2026). Comprehension refers to the use of language, visuals, and flows that are easily understood by users with different levels of competence (Lan et al., 2025). Accessibility describes the ease of obtaining versions of procedures that are applicable at the time of need (Asamani et al., 2025). Consistency and applicability demonstrate alignment of SOPs with field practices, regulations, and related processes. Updates and socialization reflect periodic evaluations, change communication, and training to keep procedures relevant to project risks.

Clear SOPs reduce the need for employees to guess the sequence of actions, outcome standards, and decision-making authority. Role clarity allows attention and effort to be directed to execution, rather than to resolving ambiguities regarding job demands. Empirical evidence suggests that role clarity improves performance by providing a cognitive structure that helps individuals allocate resources appropriately. When procedures are easy to understand and implement, process variations, errors, and unnecessary resource use can also be suppressed (Rifa & Diandra, 2026).

H2: The clarity of SOPs has a positive effect on work effectiveness.

Work Effectiveness

Work effectiveness is the degree to which employees successfully convert work inputs into outputs that meet goals, deadlines, quality standards, and accountable use of resources. This concept differs from performance as a broader construct in that effectiveness emphasizes the achievement of intended outcomes, while performance also includes contextual and adaptive behaviors that underpin the organization (Vuong et al., 2022). In a construction environment, effectiveness is seen when activities are completed correctly from the start, on schedule, and without wastage of labor, materials, or repetition of work (Zhang et al., 2023). Work effectiveness is therefore treated as a proximal mechanism that connects the work system to individual performance outcomes. Work effectiveness is measured through four dimensions. Goal achievement indicates the degree of realization of the set work targets (Asamani et al., 2025). Timeliness reflects the ability to complete tasks and handovers on schedule (Al-Hajj et al., 2025). Resource efficiency indicates the ability to produce outputs with proportionate time, effort, and materials (Zhang et al., 2023). Process accuracy and reliability indicate minimal errors, rework, and deviations from specifications (Rifa & Diandra, 2026).

Work Supervision

Work supervision is a series of monitoring, briefing, evaluation, feedback, and corrective follow-up that employers conduct to maintain alignment between work behavior and organizational standards. Recent literature distinguishes preventive supervision oriented towards deviation detection and compliance from developmental supervision that provides information, learning, and corrective support (Zhang et al., 2025). Interactional monitoring can be a work resource when employers use it to dialogue and help solve problems, rather than simply suppress behavior (Li et al., 2024). Therefore, the quality of supervision is determined not only by the intensity of the control, but also by the purpose, fairness, and usefulness of the feedback. Work supervision is measured through five dimensions. Monitoring includes observation of progress, compliance, and work obstacles in a proportionate manner (Kalischko & Riedl, 2021). Briefings describe the clarity of instruction, priorities, and support of superiors before and during the task. Evaluations show a systematic comparison between realization and set standards. Feedback reflects the timeliness, specificity, and development orientation of the performance information (Guenther et al., 2025). Corrective follow-up shows the consistency of the boss ensuring mistakes are corrected and learning is applied to the next job (Zhao et al., 2025).

Employee Performance

Employee performance is a set of individual behaviors and outcomes that are relevant to organizational goals and are within the employee's control. Systematic review confirms that adequate performance measurement is not enough using only the quantity of output, as individual contributions also arise through behaviors that maintain social context and adaptability to change (Vuong et al., 2022). Recent scale developments conceptualize perceived job performance as a multidimensional construct that includes the execution of core tasks, contextual contributions, and adaptive responses to new demands (Bhat & Bashir, 2025). This conceptualization is relevant for construction because workers must meet technical specifications while collaborating and adapting to project dynamics.

Employee performance is measured through three dimensions. Task performance reflects quality, quantity, timeliness, and mastery of core work (Çalışkan & Köroğlu, 2022). Contextual performance includes initiative, cooperation, discipline, and contributions beyond formal requirements that maintain a productive work environment (Vuong et al., 2022). Adaptive performance shows the ability to learn new methods, respond to changes, and remain effective in

the face of unforeseen conditions (Bhat & Bashir, 2025). The use of these three dimensions avoids reducing performance to mere production numbers and increases the validity of constructs in project-based organizations.

Effective coordination improves performance because scattered information and contributions can be integrated into coherent collective actions (Ma et al., 2025). Accurate communication helps employees fulfill core tasks, while mutual support strengthens contextual performance through helpful and cooperative behaviors (Al-Hajj et al., 2025). Coordination also accelerates adjustments when design, schedules, or field conditions change so that adaptive performance can be maintained (Satoinong, 2024). Therefore, coordination is expected to have direct consequences on the spectrum of individual performance.

H3: Work coordination has a positive effect on employee performance.

SOP clarity connects organizational expectations to individual behavior through actionable instruction and outcome criteria. Role clarity correlates with performance because individuals understand the priorities, responsibilities, and standards used to evaluate their work (Asamani et al., 2025). Easy-to-interpret procedural information also increases employee confidence when it comes to making decisions within the limits of their authority (Lan et al., 2025). Clear SOPs are thus expected to improve task performance through consistency and support adaptive performance through deviation handling guidelines.

H4: The clarity of SOPs has a positive effect on employee performance.

Work effectiveness represents the proximal ability to transform efforts into results that meet targets, time, and resources. Target achievement and process reliability are the foundation of task performance because they directly reflect the success of meeting the core demands of the job (Çalışkan & Köroğlu, 2022). Effectiveness also frees up the capacity to help colleagues and respond to change, so that its contribution can extend towards contextual and adaptive performance (Bhat & Bashir, 2025). Multidimensional performance evaluations are therefore expected to show a positive relationship with the effectiveness of task execution (Vuong et al., 2022).

H5: Work effectiveness has a positive effect on employee performance.

Coordination and clarity of SOPs are structural resources, but their effect on performance occurs when they improve the way work is completed. Coordination aligns time and contribution so that the process becomes smoother, which in turn improves individual outcomes (Ma et al., 2025). SOP clarity reduces ambiguity and misinterpretation so that employees can achieve targets with more controlled use of resources (Lan et al., 2025). Since the effectiveness captures the transformation of work resources into operational achievements, this construct theoretically becomes a mechanism that bridges the two antecedents with performance.

H6: Work effectiveness mediates the positive influence of work coordination on employee performance.

H7: Work effectiveness mediates the positive influence of SOP clarity on employee performance.

Effectiveness does not always result in equal performance because the quality of supervision determines whether operational achievements are maintained, evaluated, and directed to organizational standards. Developmental supervision reinforces self-efficacy and performance through feedback that helps employees understand strengths as well as needs for improvement (Zhang et al., 2025). Interactional monitoring also serves as a resource when superiors provide dialogue, support, and resolution of relevant issues (Li et al., 2024). In contrast, purely intrusive controls can add psychological demands, so supervision in this study emphasized proportional monitoring, direction, evaluation, feedback, and follow-up (Kalischko & Riedl, 2021). With high

and constructive supervision, work effectiveness is expected to be more strongly translated into performance.

H8: Work supervision positively moderates the effect of work effectiveness on employee performance; the relationship is stronger when work supervision is high.

Since supervision affects the stage of conversion of effectiveness to performance, the extent of the indirect influence of coordination and the clarity of SOPs should also depend on the level of supervision. Developmental feedback helps to maintain the results of a coordinated and standardized work process (Zhao et al., 2025). Formalization of feedback improves the consistency of performance information and clarifies the corrective actions that employees must take (Guenther et al., 2024). Thus, the mediating effect of work effectiveness is expected to be greater when supervision is carried out in a systematic and development-oriented manner.

H9: Work supervision reinforces the indirect influence of work coordination on employee performance through work effectiveness.

H10: Work supervision reinforces the indirect influence of SOP clarity on employee performance through work effectiveness.

The development of the hypothesis from the research can be explained in the research framework model as follows:

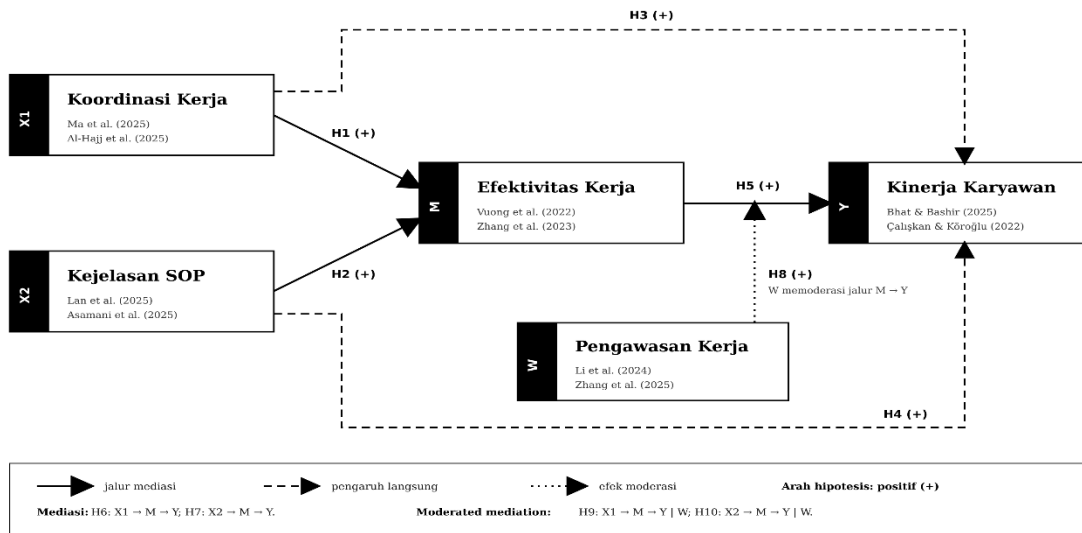


Figure 1.
Research Framework Model

RESEARCH METHOD

This study uses a quantitative approach with an explanatory design and cross-sectional surveys to analyze the influence of work coordination and clarity of operational standard procedures on employee performance through work effectiveness, as well as test work supervision as a moderator on the relationship between work effectiveness and employee performance. The research analysis unit is employees of construction companies that carry out operational activities in the Jakarta, Bogor, Depok, Tangerang, and Bekasi areas. A total of 150 respondents were selected using purposive sampling combined with geographical quota sampling, with an allocation of 30 respondents each in each region. The number was determined by considering the complexity of the model, the strength of statistics, and the need to test the effects of mediation and moderation, not only based on the practical rules of sample size (Sim et al., 2022). Respondents must be

permanent or contract employees, have a minimum of one year of employment, be involved in operational activities or project management, work under SOPs, and be under the supervision of a direct supervisor. Data were collected through a structured questionnaire using a five-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree. Work coordination was measured through the quality of communication, synchronization of activities, clarity of role division, and problem-solving; clarity of SOPs through specificity, comprehension, accessibility, consistency of implementation, and updating of procedures; work effectiveness through target achievement, timeliness, resource efficiency, and process reliability; work supervision through monitoring, briefing, evaluation, feedback, and corrective follow-up; while employee performance was measured through task, contextual, and adaptive performance. Prior to the main data collection, the instrument was evaluated through expert assessment and tested on 30 construction employees outside the research sample to ensure the clarity of the statements, the validity of the content, and the initial reliability.

Data were analyzed using Partial Least Squares Structural Equation Modeling with SmartPLS 4 because this method is suitable for predictive models involving latent constructs as well as direct influences, mediation, moderation, and moderated mediation simultaneously (Hair et al., 2022). The evaluation of the measurement model included outer loading, Cronbach's alpha, ρ_A , composite reliability, Average Variance Extracted, and Heterotrait–Monotrait Ratio. The structural model was evaluated using variance inflation factor, path coefficient, coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2), and PLSpredict (Hair et al., 2022). The significance of the hypothesis was tested by bootstrapping as many as 5,000 subsamples at a significance level of 5% and a confidence interval of 95%; a relationship was declared significant if the confidence interval did not include zero. The mediating effect was determined based on specific indirect effects, while moderation was tested through the interaction term between work effectiveness and work supervision and interpreted using a simple slope at low, medium, and high levels of supervision. Moderated mediation was analyzed by comparing the conditional indirect effect of work coordination and SOP clarity on employee performance at each level of supervision. The risk of common method bias was reduced through respondent anonymity, the use of neutral redaction, the separation of the arrangement of questions between constructs, and the full-collinearity examination of VIF (Kock et al., 2021). The application of procedural steps from the instrument design stage is important because method bias can change the strength and direction of the relationship between constructs measured through the same data source (Yao & Yang, 2024). All respondents participated voluntarily through informed consent, while data was collected without personal identification and reported in aggregate to ensure individual and company confidentiality.

RESULTS AND DISCUSSION

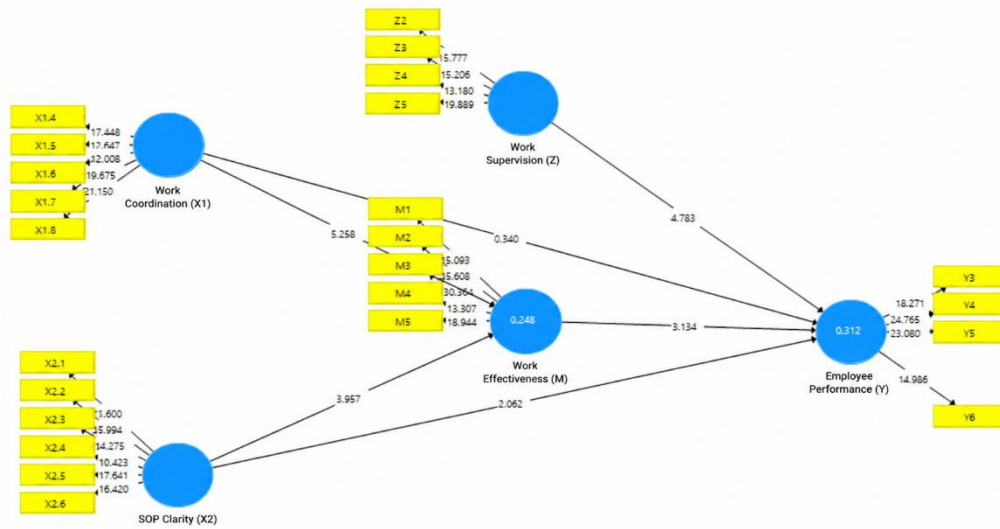


Figure 2.
Measurement Model Test Results (Outer Model)
Source: output Smart Pls 3, 2016

Evaluation of the measurement model was carried out to ensure that the indicators had adequate validity and reliability in representing the research construct. The convergent validity assessment was carried out based on outer loading and Average Variance Extracted (AVE), while internal consistency was evaluated using Cronbach's alpha and composite reliability. The indicator was declared to meet convergent validity if the outer loading exceeded 0.70 and the AVE was greater than 0.50, while the reliability of the construct was declared adequate if Cronbach's alpha and composite reliability were above 0.70 (Hair et al., 2022).

Table 1.
Results of Evaluation of Convergent Validity and Construct Reliability

Construct	Indicators and outer loading	AVE	Cronbach's alpha	Composite reliability	Conclusion
Work coordination	X1.4 = 0.773; X1.5 = 0.808; X1.6 = 0.829; X1.7 = 0.777; X1.8 = 0.771	0,627	0,851	0,894	Valid and reliable
SOP clarity	X2.1 = 0.793; X2.2 = 0.824; X2.3 = 0.847; X2.4 = 0.766; X2.5 = 0.741; X2.6 = 0.734	0,617	0,876	0,906	Valid and reliable
Work effectiveness	M1 = 0.831; M2 = 0.852; M3 = 0.822; M4 = 0.775; M5 = 0.744	0,649	0,865	0,902	Valid and reliable
Work supervision	Z2 = 0.746; Z3 = 0.740; Z4 = 0.825; Z5 = 0.789	0,601	0,779	0,858	Valid and reliable

Employee performance	Y3 = 0.747; Y4 = 0.804; Y5 = 0.788; Y8 = 0.701	0,579	0,757	0,846	Valid and reliable
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Source: Results of PLS-SEM data processing (2026).

Table 1 shows that all of the indicators that were maintained had an outer loading between 0.701 and 0.852. The M2 indicator had the highest loading of 0.852, while Y8 had the lowest loading of 0.701. Despite being close to the minimum limit, the Y8 indicator was still maintainable because it met the 0.70 criterion and still had substantive relevance in representing employee performance. The AVE value was between 0.579 and 0.649, which indicates that each construct was able to explain more than 50% of the variance of its indicators. Thus, the entire construct has met convergent validity. Cronbach's alpha value ranges between 0.757 and 0.876, while the composite reliability is between 0.846 and 0.906. All of these values exceed the limit of 0.70 but do not exceed 0.95, so the instrument has good internal consistency without showing excessive indicator redundancy. Composite reliability that is slightly higher than Cronbach's alpha is also a reasonable pattern because composite reliability takes into account the difference in loading of each indicator (Hair et al., 2022).

Discriminant validity indicates the extent to which a construct is empirically different from other constructs in the model. Evaluation was performed using the Fornell–Larcker criterion by comparing the square root of AVE on the diagonal of the matrix with the correlation between constructs. Discriminant validity is met when the square root of each construct of each construct is greater than its correlation with other constructs (Hair et al., 2022).

Table 2.

Fornell-Larcker Criterion Test Results

Construct	Work Effectiveness	SOP Clarity	Employee Performance	Work Coordination	Work Supervision
Work effectiveness	0,806				
SOP clarity	0,377	0,785			
Employee performance	0,433	0,338	0,761		
Work coordination	0,420	0,289	0,256	0,792	
Work supervision	0,406	0,303	0,474	0,279	0,776

Source: Results of PLS-SEM data processing (2026).

The square root of AVE of each construct was between 0.761 and 0.806 and was entirely higher than the correlation with other constructs. The highest correlation was found between work supervision and employee performance of 0.474, but the value was still lower than the square root of AVE of each construct, which was 0.776 and 0.761, respectively. These results show that work coordination, SOP clarity, work effectiveness, work supervision, and employee performance have different empirical characteristics. Therefore, discriminant validity based on the Fornell Larcker criterion was declared met. Structural model evaluation was conducted to assess the model's ability to explain endogenous construct variations. The determination coefficient indicates the magnitude of the variance in work effectiveness and employee performance that can be explained by the predictive construct in the model.

Tabel 3.

R-Square and Adjusted R-Square Values

Construct endogenous	R-square	Adjusted R-square	Clear power level
Work effectiveness	0,248	0,241	Relatively weak

Employee performance 0,312 0,299 Lemah–moderate

Source: Results of PLS-SEM data processing (2026).

Work coordination and SOP clarity were able to explain 24.8% of the variation in work effectiveness, while the remaining 75.2% were influenced by other factors outside the model, such as competence, resource availability, technology, work design, leadership, and project conditions. The adjusted R-square value of 0.241 showed that the adjustment to the number of predictors only reduced the clear power of the model to a limited extent. Employee performance had an R-square of 0.312 and an adjusted R-square of 0.299. This means that work coordination, SOP clarity, work effectiveness, work supervision, and interaction constructs in the model together explain 31.2% of the variation in employee performance. This value shows that the model has limited clarity but remains substantive for organizational behavior research, because employee performance is a multidimensional phenomenon that is also influenced by individual and organizational factors that are not entirely included in the model.

Effect size is used to determine the unique contribution of each exogenous construct to the R-square change of the endogenous construct. The values (f^2) of 0.02, 0.15, and 0.35 respectively describe small, medium, and large influences (Hair et al., 2022).

Table 4.
Effect Size Test Results

Interconstruct relationships	(f^2)	Interpretation
Work effectiveness → Employee performance	0,056	Small
Clarity of SOPs → Work Effectiveness	0,095	Small
Clarity of SOPs → Employee Performance	0,024	Small
Work coordination → Work effectiveness	0,141	Small, close to medium
Work coordination → Employee performance	0,001	Very small
Supervision of work → Employee performance	0,125	Small, close to medium

Source: Results of PLS-SEM data processing (2026).

Work coordination made the largest contribution to work effectiveness with ($f^2=0.141$). Although still below the limit of moderate effects, this value suggests that coordination is a relatively important predictor in explaining work effectiveness. The clarity of SOPs also contributes to work effectiveness, but the magnitude is lower, namely ($f^2=0.095$). The direct contribution of work coordination to employee performance is very small with ($f^2=0.001$). These findings indicate that coordination does not necessarily improve individual performance, but may first translate into more effective work processes. Work supervision has an effect size of 0.125 on employee performance, so its contribution is relatively greater than the direct influence of work effectiveness and SOP clarity, although it has not reached the medium category.

Hypothesis testing was carried out using bootstrapping with the value criteria ($t>1.96$) and ($p<0.05$). The positive coefficient showed that the increase in the predictor construct was followed by an increase in the outcome construct.

Table 5.
Direct Influence Test Results

Hipotesis	Interconstruct relationships	Path coefficient	T-statistic	P-value	Verdict
H1	Work coordination → Employee performance	0,024	0,340	0,734	Not supported

H2	Clarity of SOPs → Employee Performance	0,144	2,062	0,039	Supported
H3	Work coordination → Work effectiveness	0,340	5,258	<0.001	Supported
H4	Clarity of SOPs → Work Effectiveness	0,279	3,957	<0.001	Supported
H5	Work effectiveness → Employee performance	0,235	3,134	0,002	Supported

Source: PLS-SEM data processing results (2026)

Work coordination did not have a significant direct effect on employee performance ($\beta=0.024$; $t=0.340$; $p=0.734$), so H1 was not supported. A very small coefficient suggests that improved communication and alignment of activities are not enough to produce immediate changes in individual performance. Coordination in the construction industry is more likely to function as a process infrastructure that smooths the flow of work rather than as a direct determinant of individual outputs. These findings need to be understood in the context of the dependency of construction work. Coordination can improve information exchange and synchronization of activities, but the benefits are only seen when the information is successfully converted into timely and efficient completion of work. This explanation is consistent with a direct effect size value of only 0.001 and with the finding that coordination has a much stronger influence on work effectiveness. The quality of project coordination essentially creates the conditions for teams to work in an integrated manner, but performance outcomes remain dependent on the effectiveness of implementation at the operational level (Ma et al., 2025).

The clarity of SOPs has a positive and significant effect on employee performance ($\beta=0.144$; $t=2.062$; $p=0.039$), so H2 is supported. Easy-to-understand SOPs help employees recognize work stages, division of responsibilities, quality standards, and authority limits. This clarity reduces differences in interpretation and allows employees to carry out work more consistently. Although significant, the path coefficient and effect size of 0.024 indicate that the direct influence of SOP clarity is relatively small. This means that the existence of formal procedures does not automatically result in a large performance improvement without the support of implementation, resources, competencies, and supervision. Clarity of job roles and expectations remains important because it helps employees direct attention to the tasks they are responsible for and reduces uncertainty in decision-making (Asamani et al., 2025).

Work coordination has a positive and significant effect on work effectiveness ($\beta=0.340$; $t=5.258$; $p<0.001$), so H3 is supported. This relationship is the strongest direct influence in the model. Improving the quality of communication, division of roles, synchronization of schedules, and cross-functional problem solving have been shown to improve the ability of employees to achieve targets in a timely and efficient manner. These findings are relevant for the construction industry because design, procurement, implementation, quality control, and safety activities have a high level of dependence. Delays in information in one section can create waiting times, errors, or rework in another. Quality coordination helps to unify the contributions of different units into a more stable and effective workflow (Al-Hajj et al., 2025). The clarity of SOPs has a positive and significant effect on work effectiveness ($\beta=0.279$; $t=3.957$; $p<0.001$), so H4 is supported. Specific, easy-to-understand SOPs reduce the time it takes employees to interpret tasks and reduce the risk of errors in determining the order of work. Employees can focus their resources on the execution of work because the standards of results and actions required are clearly defined. Clarity of SOPs also helps organizations maintain consistency in the execution of

work on projects involving diverse functions and levels of competence. When employees understand the objectives, responsibilities, and procedures to be followed, they are better able to take actions that are in line with operational goals. These findings are in line with the argument that role clarity provides a cognitive structure that helps employees allocate effort more effectively (Lan et al., 2025).

Work effectiveness has a positive and significant effect on employee performance ($\beta=0.235$; $t=3.134$; $p=0.002$), so H5 is supported. Employees who are able to achieve targets, complete work on time, use resources efficiently, and minimize errors tend to show higher performance. These results confirm that work effectiveness is an operational mechanism that connects the work system with individual outcomes. However, the effect size of 0.056 shows that the contribution of effectiveness is still relatively small. Employee performance is not only formed through successful completion of tasks, but also through contextual behavior and adaptability to job changes (Bhat & Bashir, 2025).

Mediation testing was performed using specific indirect effects. Indirect effects were declared significant if the values of ($t>1.96$), ($p<0.05$), and the bootstrap confidence interval did not include zero.

Table 6.
Mediation Effect Test Results

Hipotesis	Indirect relationships	Coeficin	T-statistic	P-value	Types of mediation	Verdict
H6	Work coordination → Work effectiveness → Employee performance	0,080	2,523	0,012	Indirect-only mediation	Supported
H7	Clarity of SOPs → Work Effectiveness → Employee Performance	0,066	2,410	0,016	Complementary partial mediation	Supported

Source: Results of PLS-SEM data processing (2026).

Work effectiveness significantly mediated the effect of work coordination on employee performance ($\beta=0.080$; $t=2.523$; $p=0.012$), so H6 was supported. Since the direct effect of coordination on performance was insignificant, while the indirect effect was significant, the pattern showed indirect-only mediation. Thus, work coordination improves performance, especially when the coordination first results in more effective work execution. These findings explain why coordination has an almost imperceptible direct influence on performance. Communication and alignment of activities are organizational resources, but the value of these resources is only realized when employees are able to use them to achieve targets, speed up task completion, and reduce errors and waste. Work effectiveness thus becomes the main mechanism that transforms coordination into performance. Work effectiveness also significantly mediated the relationship between SOP clarity and employee performance ($\beta=0.066$; $t=2.410$; $p=0.016$), so H7 was supported. Because direct and indirect influences are both significant and have a positive direction, these results show complementary partial mediation. This means that SOP clarity improves performance through two paths, namely directly by providing consistent work guidelines and indirectly by increasing the effectiveness of work implementation.

Moderation testing was carried out by establishing an interaction term between work supervision and each predictor variable. The positive interaction coefficient showed that work supervision strengthened the influence of predictive variables on employee performance.

Table 7.

Moderation Effect Test Results

Hypothesis	Interaction relationships	Coefficin	T-statistic	P-value	Verdict
H8	Work supervision × Work coordination → Employee performance	0,173	2,118	0,034	Supported
H9	Work supervision × Clarity of SOPs → Employee performance	0,192	2,486	0,013	Supported

Source: Results of PLS-SEM data processing (2026).

The interaction of work supervision and work coordination had a positive and significant effect on employee performance ($\beta=0.173$; $t=2.118$; $p=0.034$), so H8 was supported. These results showed that work coordination had a stronger influence on performance when employees received adequate supervision. Monitoring progress, clear direction, and feedback from superiors helped ensure that the information from coordination results was actually applied in the execution of work. The moderation findings also helped explain the insignificance of the direct influence of coordination on performance. Coordination does not always provide the same results in every organizational condition. When supervision is weak, agreement and information resulting from coordination may not be followed up consistently. Conversely, when supervision is strong and developmental, superiors can turn coordination results into corrective actions and more targeted performance achievements. Monitoring accompanied by support and communication from superiors can be a work resource that increases employee confidence and involvement (Li et al., 2024). The interaction of work supervision and SOP clarity also has a positive and significant effect on employee performance ($\beta=0.192$; $t=2.486$; $p=0.013$), so H9 is supported. This interaction coefficient is greater than moderation in coordination and performance relationships, which suggests that supervision is relatively stronger in helping employees translate clear SOPs into actual performance.

SOPs provide formal standards, while oversight ensures that they are understood, implemented, and evaluated consistently. Without supervision, clear procedures can stop as administrative documents and not fully shape work behavior. Development-oriented oversight can strengthen the implementation of SOPs through feedback, clarification, learning, and follow-up on work deviations (Zhang et al., 2025). Overall, the results of the study show that work effectiveness is a central mechanism in the model. Work coordination has the most influence on effectiveness, but it does not directly influence performance. This pattern suggests that construction companies are not enough to simply increase the intensity of meetings or information exchanges. Management must ensure that coordination results in clear decisions, division of responsibilities, follow-up schedules, and resolution of operational bottlenecks.

The clarity of SOPs has a direct and indirect influence on performance. Therefore, companies need to ensure that SOPs use language that is easy to understand, explain the order of work and process owners, be available on the job site, and be updated according to changes in risks and implementation methods. Socialization and training need to be accompanied by implementation evaluations so that procedures do not simply meet administrative requirements. Work supervision serves as a condition that reinforces the benefits of coordination and clarity of

SOPs. Construction companies need to develop supervision that not only emphasizes fault finding, but also provides direction, timely feedback, problem-solving, and corrective follow-up. Developmental supervision allows employees to understand the relationship between procedures, targets, and the quality of work results. The clear power of the model that is at a weak to moderate level indicates that the performance of construction workers is still influenced by other factors outside the model. Subsequent research can include technical competence, occupational safety, organizational support, project leadership, digitalization, workload, resource availability, and project environmental conditions to improve the model's explanatory capabilities.

The novelty of this study lies in the development of an integrated model that explains that work coordination and SOP clarity do not necessarily improve employee performance directly, but work through different organizational mechanisms and conditions. Work effectiveness is placed as a mediation mechanism that transforms coordination and procedural clarity into better work achievement, while work supervision serves as a boundary condition that reinforces the influence of coordination and SOP clarity on performance. Findings regarding indirect-only mediation in coordination–performance relationships show that coordination only creates value when it successfully increases the effectiveness of work execution, while complementary partial mediation in SOP–performance clarity relationships shows that SOPs work through direct and indirect channels simultaneously. Different from previous research that generally tested coordination, SOPs, effectiveness, or supervision separately, this study combines mediation and moderation mechanisms in one empirical framework in the Greater Jakarta construction industry, thereby providing a more contextual explanation of how and under what conditions the organizational work system can improve employee performance.

CONCLUSION

This study concludes that the improvement of employee performance in the construction industry is not only determined by the existence of formal and relational work mechanisms, but mainly by the ability of the organization to transform these mechanisms into the effectiveness of work implementation. Work coordination does not show a significant direct influence on employee performance, but provides a positive influence through work effectiveness. These findings confirm that communication, synchronization of activities, division of roles, and cross-functional problem solving only produce performance value when it is able to improve the achievement of targets, timeliness, resource efficiency, and process reliability. On the other hand, the clarity of SOPs has a positive effect on performance both directly and indirectly through work effectiveness, thus forming complementary partial mediation. Thus, work effectiveness is a central mechanism that connects coordination and clarity of SOPs with employee performance in a construction environment that has high task dependence, time pressure, and operational complexity.

Work supervision has been shown to strengthen the influence of coordination and SOP clarity on employee performance, suggesting that the benefits of both work systems depend on the quality of managerial implementation. Progress monitoring, clear briefing, periodic evaluation, timely feedback, and corrective follow-up allow coordination results and SOP provisions to be translated into consistent work behavior. Theoretically, this study expands the literature on human resource management and construction management by integrating mediation and moderation mechanisms in a single empirical model. Practically, construction companies need to manage coordination, SOPs, effectiveness, and supervision as a single complementary system, not as a stand-alone practice. However, the model's still limited clarity suggests that subsequent research needs to include technical competence, project leadership, occupational safety, digitalization,

workload, and resource availability, and use longitudinal or multi-source designs to strengthen causal inference and reduce potential method bias.

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