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The Effects of Telework and On-Site Work on Job Performance Mediated by Work Engagement in the Tire Manufacturing Industry

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ABSTRACT

Changes in work systems require companies to understand how remote work and on-site work arrangements influence employee engagement and performance. This study aims to analyze the effect of telework and on-site work on job performance, with work engagement as a mediating variable among permanent (non-production) employees in the tire manufacturing industry in the Bekasi and Karawang regions. This study adopts a quantitative approach using a saturated (census) sampling technique by distributing questionnaires to 109 permanent employees aged 22–55 years. The data were analyzed using Structural Equation Modeling (SEM). The results indicate that all proposed hypotheses are supported. On- site work is found to have the strongest influence on work engagement, while telework also plays an important role in supporting employee job performance. In addition, both telework and on-site work contribute to the development of work engagement. Furthermore, work engagement plays a crucial role in enhancing job performance and serves as a mediating factor in the relationship between telework, on-site work, and job performance. These findings suggest that work engagement is a key factor in explaining how organizational work arrangements influence employee performance. This study provides practical contributions for manufacturing companies in designing appropriate work system policies by emphasizing work engagement as a strategy to improve employee job performance in a sustainable manner. Future research is recommended to expand the scope of the study across broader regions and different industry sectors, as well as to include additional relevant variables to enrich the understanding of work system management and employee performance.

Keywords: *Telework, On-Site Work, Work Engagement, Job Performance*

INTRODUCTION

In the manufacturing industry in Bekasi and Karawang, company success is determined not only by the production process but also by the performance of non-production employees such as Admin, Human Resource Department (HRD), Finance, and supply chain management (SCM). These departments play a crucial role in ensuring smooth administration, human resource management, budget planning, and the distribution of raw materials and products (Lei et al., 2024). If their performance is suboptimal, the production process in the factory can also be disrupted (Lopes et al., 2024). Achieving this performance depends not only on technical skills but also on the psychological state of employees while carrying out their work. In this context, work engagement plays a crucial role because it connects the employee's work system with their performance results (Meria et al., 2022; Li & Wang, 2024). Employees with high levels of engagement generally show greater work energy, enthusiasm, focus, and emotional involvement in the tasks they are assigned, thus potentially improving work performance consistently (Uru et al., 2022; Jamal et al., 2024).

With the advancement of digital technology and changes in post-pandemic work patterns, manufacturing companies have begun to re-examine work system designs to maintain human resource productivity and effectiveness (Lopes et al., 2024). Telework has become an alternative modern work arrangement, particularly for administrative functions such as data processing, planning, reporting, and non-operational communication, which can be performed without a physical presence on the factory floor (Capone et al., 2024). However, the characteristics of the tire industry still require that most core activities,

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such as production, quality control, maintenance, and logistics operations, be carried out directly on-site because of high safety standards and the need for machine oversight (Li & Wang, 2024). In this industry, a high level of work engagement is essential to maintain focus, energy, and psychological resilience when dealing with routine and risky production tasks (Zabielske et al., 2021). Therefore, engagement is a key variable in examining how work patterns affect performance quality (Ghonim et al., 2025).

Job performance is a measure of the extent to which work targets are achieved, reflected in an individual's ability to complete work effectively and efficiently, including task accuracy, product quality, and adherence to safety standards (Liao et al., 2024). With various work systems, such as telework and on-site work, it is important to determine whether these changes in work patterns impact employee performance (Khan et al., 2024). Therefore, job performance is important to study as an indicator of the success of a company's work system (Shin & Hur, 2021).

This situation creates a dualistic work pattern within a company ecosystem, in which some work can be transferred to telework mechanisms, while others must continue to operate on-site (Alfaleh et al., 2021). This duality has the potential to create different work experiences between employee groups, which can ultimately affect their levels of work engagement (Anakpo et al., 2023). If engagement can be maintained well across both work models, improving job performance will be easier to achieve (Wang et al., 2024). Therefore, it is important to examine how differences in telework and on-site work patterns affect work engagement and how this engagement subsequently impacts job performance in the tire manufacturing industry (Alfaleh et al., 2021).

T odate, research on telework is important because some administrative tasks in tire manufacturing companies can now be performed remotely post-pandemic (Liu & Wan, 2021). However, there is limited evidence to show whether this remote work model can truly support employee effectiveness and productivity in an industry whose operations remain heavily reliant on physical processes (Alkhayyal & Bajaba, 2023). Therefore, telework research is relevant to determine whether flexible work locations can maintain performance (Liao et al., 2024). On-site work must be studied because most key activities, such as production, quality control, and maintenance, still require in-person presence at the factory (Lopes et al., 2024). Intense physical working conditions and demanding production targets can impact employee well-being and behavior, making it crucial to understand how on-site work patterns impact employee experiences and performance outcomes (Chen et al., 2021).

Previous studies leave room for development, particularly regarding variable integration, the direction of relationships, and the context of the methodology and research objects. As a primary reference, Naqshbandi et al. ‘s (2024) study examined the influence of work models on job performance and focused on the education sector in Nigeria. This study showed that telework had no significant effect on work engagement. However, this previous research model did not include on-site work variables. The effectiveness of current work systems depends not only on telework adaptability but also on actual performance directly at the operational location. Furthermore, the relationship between variables that simultaneously examine the combined influence of telework and on-site work on job performance, especially by positioning work engagement as a connecting variable, remains very limited.

Therefore, this study adapts the model of Naqshbandi et al. (2024) with several novel elements. First, it focuses on on-site work as an independent variable to specifically assess the impact of physical work attendance. Second, it simultaneously tests the relationship between telework and on-site work within a single job performance prediction model, resulting in findings relevant to the current reality of hybrid work systems. Third, it shifts the research object from the education sector to the tire manufacturing industry in the Bekasi and Karawang regions of Indonesia, which are characterized by work based on strict physical production processes.

Thus, this study aimed to fill the research gap regarding testing a hybrid work model that combines individual digital capabilities and direct work patterns in the field and to examine the extent to which this combination affects employee work engagement and performance. The next objective was to partially measure how on-site work can impact work engagement and job performance among manufacturing industry employees. Furthermore, this study aimed to identify the variables that make the greatest contribution to improving job performance. The results of this study are expected to contribute to the development of human resource management science, while also providing practical benefits for manufacturing companies in Bekasi and Karawang in determining more effective work patterns to support performance improvement.

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LITERATURE REVIEW

Job Performance

Wang and Chen (2020) define job performance as work behavior or actions that align with organizational goals, not only related to the final result but also how these contributions help achieve work targets. According to Shin and Hur (2021), job performance is the level of effectiveness of a person's work as seen from the extent to which work tasks and responsibilities can be completed well. Irfan et al. (2021) emphasize job performance as the output of work behavior that provides value to the organization; the quality of task execution, accuracy, and work effort are factors that determine the results achieved. Hafidz and Nurdiansyah (2024) define job performance as the overall contribution made by an individual to achieving organizational goals, which is reflected through task performance, prosocial behavior that supports the work environment, and efforts to avoid actions that are detrimental to the organization. According to Lei et al. (2024), job performance can be interpreted as the level of real contribution shown by an individual in completing their work tasks and responsibilities, thereby supporting the achievement of goals and overall organizational effectiveness.

Work Engagement

Wang and Chen (2020) state that work engagement is a condition in which individuals are fully present cognitively, emotionally, and physically when carrying out their work roles so that they are truly involved and integrated with the work process. Toscano and Zappalà (2021) define work engagement as a psychological condition reflected through three main aspects: vigor (high energy and mental toughness), dedication (enthusiasm and a sense of meaning in carrying out work), and absorption (full involvement and immersion in work activities). According to Lee et al. (2024), work engagement is physical, emotional, and cognitive involvement in work activities so that a person's energy, enthusiasm, and focus are poured into their performance. Meanwhile, according to Rożnowski and Wontorczyk (2024), work engagement is a motivational condition in which individuals show extra work effort that will improve overall employee performance. According to Khurshid et al. (2022), work engagement is a form of work motivation that arises when employees are supported by sufficient work resources, which is reflected in high work energy, commitment to work, and resilience in facing work demands.

Telework

Miglioretti et al. (2021) define telework as a work arrangement that gives employees autonomy in determining their work location, allowing work to be performed virtually from various geographic locations without requiring a physical presence at the workplace. Nagata et al. (2021) define telework as the flexibility for employees to determine their work location and allow work to be carried out virtually without requiring a physical presence in the office. Mihalca et al. (2021) state that telework is a work arrangement in which tasks are performed outside the main office with the support of information and communication technology. Furthermore, Alkhayyal and Bajaba (2023) define telework as the use of information technology to carry out work from outside the employer's workplace. Silva et al. (2024) define telework as a remote work pattern in which employees can complete their responsibilities without being physically present at the work location by utilizing available digital facilities. Based on these various definitions, telework in this study is understood as a remote work arrangement that allows employees to complete tasks using digital technology without being physically present at the company's work location.

On-Site Work

Chen et al. (2021) emphasized that on-site work is a work arrangement pattern in which employees perform work at the company's physical location (office, factory, or work facility) with full in-person presence. Wang et al. (2023) stated that on-site work involves face-to-face interaction, direct coordination, and the use of work facilities located in the organization's workspace. Anakpo et al. (2023) emphasized that on-site work requires workers to be physically present at the company's workplace as part of the traditional work structure. Furthermore, Chudzicka et al. (2023) stated that on-site work is a work configuration that relies on physical presence to ensure coordination functions, managerial control, direct supervision, and access to operational resources at the company's location. Lopes et al. (2024) defined on-site work as a conventional work model in which taskloads, collaboration, and the implementation of work activities are carried out at the company's physical workplace, rather than remotely or virtually.

THEORETICAL FRAMEWORK AND HYPOTHESES

Telework with Work Engagement

Although telework provides flexibility in determining work location and hours, it does not always

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result in high work engagement (Kakkar et al., 2023). Excessive flexibility can create new challenges, such as a lack of boundaries between work and personal time, increased distractions in the home environment, and the potential for mental fatigue due to work tasks and activities intermingling with domestic activities (Lopes et al., 2024). Furthermore, limited face-to-face interaction can make collaboration and communication less effective than in the office, especially if digital coordination is not optimal (Parent-Lamarché, 2023). Decreased communication quality can weaken the sense of connectedness to the team and work goals, resulting in decreased energy, focus, and enthusiasm for work (Khurshid et al., 2022). In other words, although telework offers freedom and flexibility, if not balanced with a good digital work system, a clear work structure, and adequate communication support, it can actually reduce employee work engagement (Naqshbandi et al., 2024). Findings (Parent-Lamarché, 2023; Wang et al., 2023) also indicate that increased telework negatively impacts work engagement, particularly in the context of remote working. Based on the theoretical explanation and empirical findings, the research hypothesis can be formulated as follows: **H_1**: Telework negatively impacts work engagement.

On-Site Work with Work Engagement

On-site work requires employees to be present directly at the work location, allowing for real-life social interactions, work coordination, and physical work experiences (Uru et al., 2022). Being present at work provides faster access to job resources, such as coworker support, supervisory guidance, production facilities, and easy access to information (Wang et al., 2023). Access to these resources can enrich the work experience and provide role clarity, ultimately increasing employee engagement (Miglioretti et al., 2021). Furthermore, direct involvement in the operational environment can strengthen employees' emotional ties to work processes and company goals (Toscano & Zappalà, 2021). Employees who work directly have a greater opportunity to experience organizational dynamics in real-time, experience work results directly, and receive faster feedback (Tsang et al., 2023). These conditions encourage positive energy, work enthusiasm, and full attention to tasks, potentially increasing work engagement (Chudzicka et al., 2023). Thus, the more effective the implementation of on-site work and the work support available at operational locations, the greater the opportunity for employees to feel enthusiastic, energized, and fully involved in their work, thus increasing levels of work engagement. This is in line with previous research findings (Nagata et al., 2021; Uru et al., 2022), which found that increasing on-site work can increase levels of work engagement. Based on the logic above, we propose the following hypothesis:

H_2: On-Site Work has a positive effect on Work Engagement.

Telework with Job Performance

Telework provides employees with flexibility in determining their work location, allowing them to adjust their work rhythm and environment according to their individual preferences (Alkhayyal & Bajaba, 2023). This can reduce the physical and mental stress associated with commuting, increase work comfort, and encourage employees to be more effective in completing tasks because they feel in control of how they work (Mihalca et al., 2021). Furthermore, telework allows employees to continue their work activities with the help of digital technology, facilitating communication, reporting, and coordination, even remotely (Kozako et al., 2024). As long as the virtual work system operates well and information access remains smooth, productivity and accuracy of task completion can be maintained (Popaitoon, 2023). Therefore, the implementation of telework supported by adequate digital facilities and clear work procedures has the potential to improve job performance, as employees can work optimally without being tied to a specific physical work location (Liu & Wan, 2021). Research results (Liao et al., 2024; Silva et al., 2024) indicate that telework can improve job performance in a remote work context. Based on the above explanation, the following hypothesis is proposed:

H_3: Telework has a positive effect on Job Performance.

On-Site Work with Job Performance

On-site work requires employees to be present directly at the company's operational location, allowing for direct work interactions, supervision, coordination, and access to production facilities (Chudzicka et al., 2023). This physical presence makes it easier for employees to receive supervisory direction, obtain prompt feedback, and complete work according to applicable work procedures in the field (Chen et al., 2021). Direct access to machines and operational resources enables employees to work more effectively and accurately, while strengthening their connection to the work process through direct observation of the results and impact of their tasks (Lopes et al., 2024). A structured and controlled physical work environment also encourages work discipline and compliance with company operational standards (Anakpo et al., 2023). Thus, optimal on-site work implementation, both in terms of facilities and operational coordination, has the potential to improve employee job performance by producing more precise, accurate, and targeted work (Torlak & Kuzey, 2019). Findings (Alfaleh et al., 2021; Khan et al., 2024) also indicate that positive

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psychological factors emerging in field work environments can significantly improve work outcomes, including employee performance. In line with the theoretical foundations explained previously, the research hypothesis can be formulated as follows:

H_4: On-Site Work has a positive effect on Job Performance.

Work Engagement with Job Performance

Work engagement describes a psychological state in which employees feel energized, strongly committed, and deeply focused on their work (Gabriel & Aguinis, 2022). When someone is engaged, they are more enthusiastic, dedicated, and engaged in daily work activities. They tend to exhibit greater focus, more proactive responses, and a willingness to exert extra effort to support the achievement of work and organizational goals (Lee et al., 2024). Employees with high levels of work engagement tend to demonstrate extra effort, are more disciplined, and have an intrinsic drive to achieve the best results (Wang et al., 2024). Therefore, engagement naturally leads to better job performance in terms of both core task execution and extra behavioral contributions that support the organization (Amalia et al., 2021). This logic aligns with research (Briones et al., 2023; Naqshbandi et al., 2024) indicating that high engagement has implications for increased performance and satisfaction in the context of remote work. Based on the theoretical explanation presented previously, the research hypothesis is formulated as follows:

H_5: Work Engagement has a positive effect on Job Performance.

The Relationship Between Work Engagement and Telework and Job Performance

Telework allows employees to work more flexibly, reducing travel burdens and creating a more comfortable work environment (Kakkar et al., 2023). These more flexible working conditions can enhance employees' sense of autonomy, self-control, and psychological well-being while working (Khurshid et al., 2022). When employees feel that the work process better aligns with their preferences and rhythm, positive work energy tends to increase (Zabielske et al., 2021). This increased well-being can trigger work engagement, which is a feeling of enthusiasm, passion, and full involvement in the tasks being performed (Huo et al., 2024). Employees with high work engagement tend to be more focused, take initiative, and persevere; thus, high work engagement leads to improved job performance (Liu & Wan, 2021). This means that while telework does not always directly improve performance, the flexibility it provides can strengthen employees' psychological engagement, and this state of engagement then influences performance improvement (Mihalca et al., 2021). Other studies, such as those by Liu et al. (2020) and Tsang et al. (2023), have confirmed that telework influences job performance in the context of remote working, with work engagement as a connecting factor. Therefore, referring to the conceptual foundation and empirical findings described previously, the research hypothesis can be formulated as follows:

H_6: Work Engagement mediates the relationship between Telework and Job Performance.

The Relationship Between Work Engagement and On-Site Work and Job Performance

On-site work places employees directly in the physical work environment, allowing for real-time interaction, coordination, and access to work facilities (Uru et al., 2022). Being present at the worksite allows employees to receive direction, support, and feedback more quickly, as well as directly see the results of each task they complete (Wang et al., 2023). This fosters a stronger sense of connection to the company's work processes and goals, potentially increasing work engagement because employees feel the direct impact of operational activities (Toscano & Zappalà, 2021). When work engagement increases, characterized by enthusiasm, positive energy, and full attention to tasks, employees tend to work with greater focus and demonstrate greater effort (Chen et al., 2021). Ultimately, high work engagement can drive improved job performance, as psychologically engaged employees tend to be more consistent, disciplined, and responsible in completing their tasks (Mihalca et al., 2021). Findings (Toscano & Zappalà, 2021; Hackney et al., 2022) indicate that supportive working conditions and psychological space can increase engagement and indirectly impact work output. Based on the theoretical understanding and the results of previous research presented, the following hypothesis is formulated:

H_7: Work Engagement mediates the relationship between On-Site Work and Job Performance.

Based on the theoretical logic explanation above, the following research model was created:

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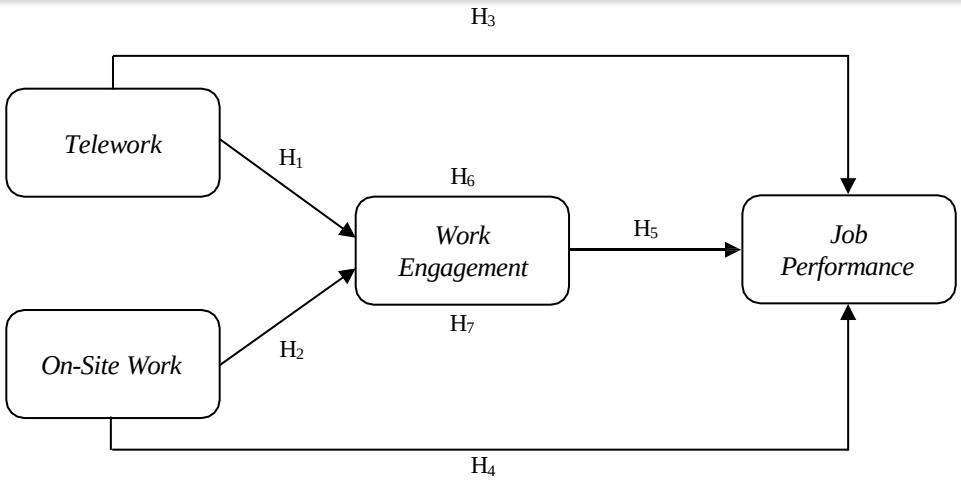

Figure 1. Conceptual Framework

RESEARCH METHOD

This study adapted from a previous journal, there are 20 instruments in this research questionnaire. The measurement related to the telework variable consists of five statements adopted from Miglioretti et al. (2021), the measurement of the on-site work variable consists of five statements adopted from Rożnowski & Wontorczyk (2024), the measurement of the work engagement variable consists of five statements adopted from Gwamanda et al. (2024), and the measurement of the job performance variable consists of five statements adopted from (Santalla-Banderali, 2022). This research instrument was adapted from Miglioretti et al. (2021), Rożnowski & Wontorczyk (2024), Gwamanda et al. (2024), and Santalla-Banderali (2022) with editorial and conceptual adjustments to ensure clarity of meaning, avoid duplicate instruments, and maintain the purity of the construct in the context of the tire manufacturing industry in Indonesia.

The sampling technique used was saturated sampling (census), which is a sampling method that makes all members of the population respondents. According to Sugiyono (2018), saturated sampling is a sampling technique in which all members of the population are used as research samples, especially when the population size is relatively small so that comprehensive data collection is possible. The population in this study comprised permanent employees (non-production) covering the administration, human resources department (HRD), finance, and supply chain management (SCM) divisions in the tire manufacturing industry located in Bekasi and Karawang. Based on the research criteria, the population was focused on employees aged 22–55 years and had worked for at least the past year, of which a total of 109 people were known. To ensure that respondents who filled out the questionnaire met these qualifications, screening questions were included at the beginning of the questionnaire.

Given the specific population size, this study employed a saturated sampling (census) technique. According to Sugiyono (2018), saturated sampling is a sampling technique in which all members of a population are used as research samples, particularly when the population size is relatively small, allowing for comprehensive data collection. Using this method, all 109 respondents were selected as research samples.

The data collection technique used was an online questionnaire distributed via Google Forms. Data were collected twice. The questionnaire used a Likert scale with a measurement scale of 1-4, where a score of four indicated strongly agree (SS), a score of three indicated agree (S), a score of two indicated disagree (TS), and a score of one indicated strongly disagree (STS). This type of research was quantitative research using the structural equation modeling (SEM) method. In this study, a pretest was administered to 30 respondents, followed by analysis using the SPSS software to test the validity and reliability of the instruments used. The validity process included measuring the Kaiser-Meyer-Olkin (KMO) value and the measure of sampling adequacy (MSA), which assess sample adequacy in the factor analysis. A KMO and MSA value exceeding 0.5 is considered a validating instrument for further analysis. Furthermore, the reliability of the measuring instrument was evaluated using Cronbach's alpha coefficient, with a sufficient value of ≥ 0.6 (Hair et al., 2021).

The results of a pretest conducted on 30 respondents using confirmatory factor analysis (CFA) revealed that all research variables met the test eligibility criteria. This was indicated by the Kaiser Meyer Olkin (KMO) and measures of sampling adequacy (MSA) values in the anti-image matrix correlation, which were above or equal to 0.50; thus, the data were deemed suitable for further analysis. In addition, the results of the reliability test showed that all variables had a Cronbach's alpha value of ≥ 0.60, indicating that the research instrument had a good level of internal consistency. Thus, it can be concluded that the research

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instrument met the criteria for validity and reliability; therefore, the study could proceed to the main data collection stage.

Subsequently, the analysis of primary data obtained from 109 respondents was conducted using the structural equation modeling (SEM) method based on partial least squares (PLS), which tested the outer and inner models. In the outer model testing, convergent validity, discriminant validity, reliability, collinearity, and adjusted R square were evaluated. While the inner model testing consists of p-value, t-statistic, and original sample criteria. The magnitude of the convergent validity value can be determined by examining the loading factor value in the outer loading table and the average variance extracted (AVE) value. According to Hair et al. (2022), values that meet convergent validity are > 0.70 for loading factors, composite reliability > 0.70, and for the AVE value is > 0.50. Furthermore, according to Hair et al. (2022), if the T statistic value is greater than the T table (1.650) with a P value < 0.05, it can be said to have a positive influence; otherwise, the direction of the relationship can be determined by looking at the original sample value.

RESULTS AND DISCUSSION

This study involved 109 respondents who were permanent non-production employees in the tire manufacturing industry in Bekasi and Karawang. Based on the data collected through Google Forms, the demographic profile showed a dominant pattern of senior and experienced workers. Specifically, the characteristics of the respondents were dominated by men, numbering 87 (79.4%). Regarding age maturity, the majority of respondents were in the 46–55 year age group (39.2%). Furthermore, in terms of academic background and work track record, most of the sample were graduates with a bachelor's degree (55.7%) and employees with more than 10 years of service (79.4%).

Outer Model Test Results

Table 1. Results of Respondent Data Validity Test

Variable	*Indicator*	*Outer Loading*	*Cronbach's Alpha*	*Composite Reliability*	*AVE*
Job Performance	JP1	0. 731	0.800	0.862	0.555
	JP2	0. 745			
	JP3	0.717			
	JP4	0.776			
	JP5	0.755			
On-Site Work	OS1	0.766	0.805	0.865	0.562
	OS2	0. 744			
	OS3	0.718			
	OS4	0.811			
	OS5	0.706			
Telework	TW1	0.761	0.823	0.876	0.685
	TW2	0. 752			
	TW3	0.776			
	TW4	0.748			
	TW5	0.785			
Work Engagement	WE1	0.728	0.845	0.891	0.621
	WE2	0. 776			
	WE3	0.710			
	WE4	0.846			
	WE5	0.868			

Source: Researcher-processed data findings, 2026

The convergent validity value can be determined by examining the loading factor value in the external loading table and can also be observed from the average variance extracted (AVE) value. Hair et al. (2022) fixed quantity that must be met to measure convergent validity is > 0.70, then for factor loading and AVE with a value > 0.50. In this study, the loading factor value obtained from 20 instruments was > 0.70; therefore, the 20 instruments were acceptable, and the AVE value was >
0.50; therefore, it satisfies the requirements, and it can be concluded that the 20 instruments are acceptable. Specifically, the job performance construct in this study is positioned as task performance, namely performance directly related to the implementation of core tasks and job responsibilities, not contextual

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performance related to extra-role behavior or contributions outside the formal job description. The absence of instrument elimination in this study does not constitute a methodological weakness but rather reflects the quality of the research instrument design. All questionnaire items were structured based on relevant theoretical foundations and adapted to the characteristics and operational context of the tire manufacturing industry. Furthermore, the consistent understanding of each statement by respondents indicates that the instruments used accurately represent the research constructs and are perceived uniformly by the employees as research respondents.

Furthermore, the internal consistency reliability test used to measure the instrument's ability to measure its latent constructs was based on composite reliability and Cronbach's alpha values, which were acceptable at > 0.60-0.70 (Hair et al., 2022). The data processing results showed that all latent variables (constructs) had composite reliability values > 0.70 and Cronbach's alpha values > 0.60. Thus, both Composite Reliability and Croncbach's Alpha values met the requirements.

Discriminant validity describes the differences between one latent variable and another (Hair et al., 2022). Cross-loading is a method that can explain the discriminant validity test. The cross-loading value indicates the correlation between an instrument and its construct and other constructs. The correlation value of an instrument with its latent variable must be greater than its correlation value with other latent variables (Hair et al., 2022). Based on the calculation results, the overall cross-loading value for the measurement items for telework, on-site work, work engagement, and job performance has a greater value and is strongly correlated with the main variable being measured compared to other variables, indicating that the variables have good discriminant validity.

Collinearity between instruments is measured using the Collinearity Statistics (VIF) value. In the Outer VIF Value table, a VIF value < 5 indicates that the instruments do not have collinearity issues (Hair et al., 2022). The calculations show that all instruments have VIF values < 5, indicating that they do not experience multicollinearity issues.

Table 2. R Square Adjusted

	R Square	***R Square Adjusted***	***Conclusion***
Work Engagement	0.615	0.607	Moderate
Job Performance	0.748	0.740	Moderate

Source: Researcher-processed data findings, 2026

The coefficient of determination (R^2) is used to explain the extent to which variables X and Z are able to explain variations in the dependent variable Y (Hair et al., 2022). Based on the results of the model testing, it is known that the telework and on-site work variables can explain variations in work engagement by 60.7%, whereas the remaining variance of 39.3% is formed by other factors outside this research model. Furthermore, in the final dependent variable testing, the combination of telework, on-site work, and work engagement variables was proven to explain job performance by 74.0%. This indicates that the model has strong explanatory power, although there is still a remaining performance variation of 26.0% influenced by other variables not examined. The remaining unexplained percentage reflects the involvement of other individual and organizational factors in the field that have the potential to shape the job performance of non-production employees in the tire manufacturing industry, such as work motivation, leadership style, organizational culture, job satisfaction, compensation systems, workload, work environment, employee competence, and work stress levels.

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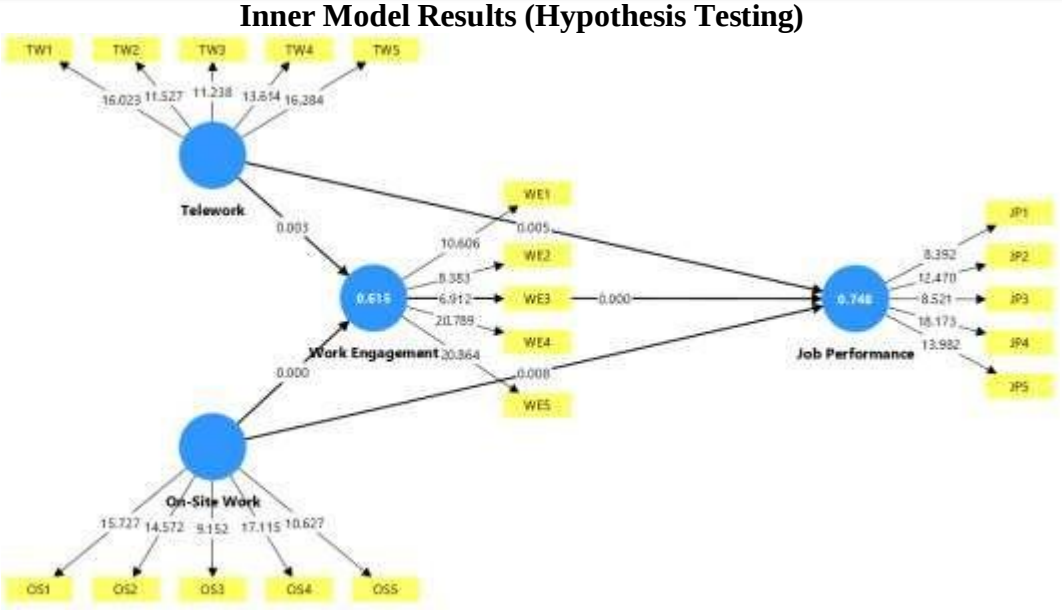

Figure 2. Hypothesis Test Results

The inner model (hypothesis test) of the study was conducted by examining the significance of the path coefficients. According to Hair et al. (2022), if the statistical T value is greater than the T table (1.650) at the 5% level, with a p-value < 0.05, a significant effect can be observed, and the direction of the relationship can be determined by examining the original sample values.

Table 3. Direct Influence Test Results

	Hypothesis	***Original Sample (O)***	***T Statistics (|O/STDEV|)***	***P Values***	***Information***
TW → WE	H_1	0.259	2.795	0.003	The data support the hypothesis
OS → WE	H_2	0.589	6.766	0.000	The data support the hypothesis
TW → JP	H_3	0.188	2.557	0.005	The data support the hypothesis
OS → JP	H_4	0.212	2.407	0.008	The data support the hypothesis
WE → JP	H_5	0.551	6.592	0.000	The data support the hypothesis

Source: Researcher-processed data findings, 2025

Inner model testing (hypothesis testing) was conducted by examining the results of the path coefficient significance. If the T statistic value is greater than the T table (1.650) at the 5% level, with a p-value

If p< 0.050, it can be said that there is a positive influence. Testing the hypothesis of one influence of telework (TW) on work engagement (WE) obtained a T statistic of 2.795 > 1.650 with a p-value of 0.003 < 0.050, it can be said that there is a significant and positive influence between telework and work engagement; thus, H_1 is supported. This finding is novel in the research, as it differs from the findings of Naqshbandi et al. (2024), who state that telework actually has a negative impact on work engagement and job performance. This difference in results indicates a research gap, thus providing a new perspective on the relationship between telework and employee engagement levels.

The hypothesis testing of two influences of on-site work (OS) on work engagement (WE) obtained a t-statistic of 6.766 > 1.650 with a p-value of 0.000 < 0.050, incating that there is a positive influence between OS and WE. Thus, H_2 is accepted. This finding also shows that the influence of OS and on WE is the most dominant direct influence compared to other independent variables in the research model. Conceptually, working conditions directly at the work location allow for intense social interaction, more effective communication, and more real supervision and support from superiors, which allows employees to feel more cognitively, emotionally, and physically involved in their work.

Based on the results of the third hypothesis test, it is known that the influence of Telework (TW) on job performance (JP) shows a t-statistic value of 2.557, which is greater than the t-table value of 1.650, with a p-value of 0.005, which is smaller than 0.050. This indicates that telework has a positive effect on job performance; therefore, Hypothesis H3 is supported.

Furthermore, the results of the fourth hypothesis test show that the influence of on-site work (OS) on

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Vol. 5 Issue 1, January-June 2026
DOI:10.55299/ijec.v5i1.1838

job performance (JP) has a t-statistic value of 2.407, which is greater than the t-table value of 1.650, with a p-value of 0.008, which is smaller than 0.050. Thus, it can be concluded that on-site work has a positive effect on job performance; therefore, Hypothesis H_4 is accepted.

The results of the fifth hypothesis test show that the influence of work engagement (WE) on job performance (JP) yield an t-statistic value of 6.592, which is greater than the t-table value of 1.650, and a p-value < 0.001, which is smaller than 0.050. These results indicate that Work Engagement has a positive effect on Job Performance, so that the H_5 hypothesis is declared accepted. This finding also indicates that work engagement is the most dominant variable in influencing job performance compared to other independent variables in the research model.

Analysis of Mediation Effects

Table 3. Indirect Effect Test Results

	Hypothesis	*Original Sample (O)*	*T Statistics (|O/STDEV|)*	*P Values*	*Information*
TW → WE → JP	H_6	0.325	5.202	0.000	The data support the hypothesis
OS → WE → JP	H_7	0.143	2.426	0.008	The data support the hypothesis

Source: Researcher-processed data findings, 2026

Then the sixth hypothesis tests the mediation effect of Work Engagement (WE) between the relationship between Telework (TW) and Job Performance (JP) obtained a T statistic of 5.202 greater than the T table (1.650) with a p-value of 0.000 < 0.050. This indicates that work engagement has a positive mediating effect on the relationship between telework and job performance. Thus, H_6 is accepted.

Finally, Hypothesis 7 tests the mediating effect of work engagement (WE) between the relationship between on-site work (OS) and job performance (JP); the T statistic is 2.426, which is greater than the T table (1.650) with a p-value of 0.008 < 0.05. This indicates that work engagement has a positive mediating effect on the relationship between on-site work and job performance. Thus, H_7 is accepted.

Conceptually, the role of work engagement in both relationships is considered full mediation. This indicates that both telework and on-site work systems can significantly impact job performance when driven by increased employee work engagement. Unlike partial mediation, this full mediation condition confirms that the effectiveness of work patterns is highly dependent on the mediator to produce optimal performance. This conclusion is supported by the results of the statistical analysis, which shows that the magnitude of the indirect effect (indirect effect > 0.5) operates more dominantly in the model than the direct effect (direct effect = 0.2557). Thus, work engagement is proven to be the main pathway and a key psychological mechanism that is absolutely necessary to bridge the influence of work system implementation on employee performance achievement.

The findings of the first hypothesis indicate that the implementation of telework plays a role in increasing the work engagement of permanent (non-production) employees in the tire manufacturing industry in Bekasi and Karawang. The remote work system helps employees maintain a work-life balance, allowing them to work more comfortably, focused, and without being overburdened. The flexibility of time and the opportunity to work independently encourage a sense of responsibility, self-confidence, and commitment to completing tasks, even without direct supervision. The effectiveness of telework in increasing work engagement is also influenced by the characteristics of the support function, which is administrative and knowledge-based; that is, it does not rely entirely on physical presence at the production site. Furthermore, the characteristics of the respondents most of whom were aged 22–29 and had relatively long tenure contributed to the formation of work engagement because employees understood the demands of the job and felt a sense of belonging to the organization. The relatively long work distance also helps telework reduce physical fatigue, allowing employees to maintain enthusiasm for their work. These results align with the research of Parent-Lamarche (2023) and Wang (2023), who found that telework influences work engagement.

The findings of Hypothesis 2 indicate that on-site work plays a role in increasing the work engagement of permanent (non-production) employees in the tire manufacturing industry in Bekasi and Karawang. Being present in the office facilitates communication and problem-solving through face-to-face interactions, resulting in faster and clearer coordination. This helps employees maintain commitment, focus, and enthusiasm when completing tasks. Furthermore, on-site work provides a more focused work structure through task allocation, direct direction, and supportive supervision. An interactive work environment also strengthens social relationships and a sense of engagement because employees can directly see their contributions to the team and organization. In the context of the manufacturing industry, with its relatively

e-ISSN: 2961-712X
Vol. 5 Issue 1, January-June 2026
DOI:10.55299/ijec.v5i1.1838

high level of occupational risk, physical presence and intensive coordination are crucial factors in maintaining quality and smooth operations. Respondent characteristics also strengthen this relationship. The majority of employees have long tenures and are aged 22–29 years, making them accustomed to face-to-face work patterns and requiring direct interaction in their work. These results align with the research of (Nagata, 2021: Uru, 2022) who found that on-site work influences work engagement.

The findings of the third hypothesis indicate that telework improves the job performance of permanent (non-production) employees in the tire manufacturing industry in Bekasi and Karawang. The remote work system helps employees maintain a work-life balance, allowing them to work more comfortably, focused, and in a controlled manner. The flexibility of time and the opportunity to work independently encourage discipline, responsibility, and the completion of tasks with maintained quality. Telework also increases employee confidence and enthusiasm in carrying out their roles, ensuring that performance remains stable even without direct supervision. The respondents' characteristics, the majority of whom were aged 22–29 and had relatively long tenure, contributed to their ability to manage time, understand work standards, and maintain the quality of work results. Furthermore, the relatively long distances involved mean that telework helps reduce fatigue, allowing energy to be focused on optimally completing work. These results align with the research of Liao (2024) and Silva (2024), confirming that telework influences job performance.

The findings of Hypothesis 4 indicate that on-site work influences the job performance of permanent (non-production) employees in the tire manufacturing industry in Bekasi and Karawang. Attendance at the office expedites work completion through direct communication and coordination, thereby encouraging discipline and punctuality in completing tasks. Face-to-face interactions with coworkers and direct direction from superiors help employees understand their priorities and contributions to the team, resulting in optimal performance. Respondent characteristics also support this relationship. Most employees have relatively long tenures, thus understanding the company's workflow and expectations. Furthermore, employees aged 22–29 tend to have stable work responsibilities and discipline; thus, the office work environment helps maintain the rhythm and consistency of performance. These results align with Alfaleh (2021) and Khan (2024), who state that on-site work impacts job performance.

The findings of Hypothesis V confirm that work engagement has a significant effect on the job performance of permanent (non-production) employees in the tire manufacturing industry in Bekasi and Karawang. Employees with high levels of work engagement demonstrate stronger commitment, focus, and responsibility in completing tasks, including when facing work pressure. Emotional and cognitive engagement in work drives improved work quality, punctuality, and consistency in achieving targets. This relationship is further strengthened by the characteristics of the respondents, the majority of whom have relatively long working periods and are in the 22–29 year age range, thus understanding job demands and demonstrating a mature work attitude. These conditions make work engagement a key factor that directly drives the achievement of more focused and stable performance. These results are in line with the findings of Briones (2023) and Naqshbandi (2024), who state that work engagement influences job performance.

The results of the study indicate that work engagement mediates the relationship between telework and job performance. Telework creates work flexibility and independence, which increases employee confidence, enthusiasm, and responsibility. The emotional and cognitive engagement formed through remote work systems fosters discipline, work quality, and punctuality in task completion. Thus, telework does not directly improve performance but first builds work engagement as a psychological mechanism that translates work flexibility into optimal performance. This mediating role applies to both genders, who are equally able to maintain work engagement and commitment within telework systems. These findings align with the research of Liu (2020) and Tsang (2023), who confirmed that work engagement bridges the relationship between telework and job performance.

The final results confirm that work engagement mediates the relationship between on-site work and job performance among permanent (non-production) employees in the tire manufacturing industry in Bekasi and Karawang. Physical presence in the office fosters direct communication, clearer supervision, and access to adequate facilities, which enhance focus, comfort, and clarity of work priorities. These conditions strengthen employees' emotional and cognitive attachment to their work, leading to greater discipline, responsibility, and consistency in achieving performance targets. Thus, on-site work does not merely influence performance directly; it first cultivates work engagement, which then translates structured working conditions into improved job performance. This mediating effect is reinforced by employees' relatively long tenure and their readiness to work within face-to-face organizational systems, regardless of gender. These findings are consistent with prior research by Toscano and Hackney, who highlight the mediating role of work engagement in the relationship between on-site work and job performance.

e-ISSN: 2961-712X
Vol. 5 Issue 1, January-June 2026
DOI:10.55299/ijec.v5i1.1838

CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

This study provides a theoretical contribution to the literature on the relationship between telework, on-site work, work engagement, and job performance in the context of the Banyuwangi manufacturing industry. The research findings indicate that telework and on-site work have a direct influence on employee performance and an indirect influence through work engagement as a psychological mechanism. These results confirm that the work system functions not only as a work location arrangement but also as a work resource (job resources) capable of shaping the level of employee engagement. Furthermore, this study strengthens the role of work engagement as a partial mediating variable that explains how the work system translates into optimal work performance.

This study has several limitations. First, respondents only included permanent (non-production) employees in the tire manufacturing industry in Bekasi and Karawang; therefore, the findings cannot be generalized to other production functions or industrial sectors with different work characteristics. Second, the limited regional coverage makes the research results contextualized according to the characteristics of the industrial area. Practically, companies need to strategically manage telework and on-site work to boost job performance. Telework must be supported by clear targets, communication systems, and adequate technological infrastructure, whereas on-site work needs to be strengthened through direct coordination, a clear work structure, and supportive supervision. Above all, increasing work engagement through feedback, appreciation, and employee development is key to successful performance improvement. Future research is recommended to expand the scope of respondents to other production functions, regions, and industrial sectors and to use more diverse research designs to increase generalizability and theoretical contributions to the field of human resource management.

The research confirms that the effectiveness of telework and on-site work in improving job Performance depends heavily on a company's ability to build work engagement. A work system is not simply a location arrangement but a strategic instrument for creating psychological engagement that drives optimal performance. In telework, management must ensure clear targets, structured communication, technological support, and a culture of trust to ensure that flexibility aligns with discipline and responsibility. Without strong work engagement, flexibility risks compromising coordination and performance consistency. In on-site work, companies need to strengthen direct interaction, team coordination, provide clear direction, and provide adequate work facilities to maintain employee focus and commitment. Strategically, increasing work engagement through feedback, appreciation, and competency development should be a top priority, as work engagement has been shown to be a key mechanism bridging work systems with sustainable job performance.

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