

Human Capital Optimization in Logistics: A Quantitative Analysis of Motivational and Environmental Determinants of Performance

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ABSTRACT: This study investigates the influence of work motivation and work environment on employee performance within PT Aerojasa Cargo's warehouse division. Recognizing the strategic importance of human capital in logistics, the research aims to evaluate how these two variables interact to affect operational outcomes. Using a quantitative methodology, the study surveyed 55 employees selected through Slovin's formula. A structured Likert-scale questionnaire measured three core constructs: motivation, work environment, and performance. Data were analyzed using SPSS 26.0, employing descriptive statistics, multiple regression analysis, and validation metrics such as Cronbach's alpha and R^2 . Key results show that both motivation and work environment significantly impact employee performance ($p < 0.05$), with a combined explanatory power of 83.3% ($R^2 = 0.833$). The work environment demonstrated a slightly higher beta coefficient ($\beta = 0.417$) than motivation ($\beta = 0.286$), suggesting that physical and social workplace conditions are marginally more influential. Descriptive findings also revealed demographic patterns relevant to performance, including age distribution, education level, and gender roles. These findings align with existing literature and underscore the synergistic importance of fostering motivation and creating supportive work environments. The study concludes that HR managers in logistics should implement dual-focused strategies to enhance both motivational drivers and workplace quality. Such strategies may include high-performance work systems, ergonomic improvements, and continuous feedback mechanisms. This research contributes to the field of organizational behavior by offering empirical support for integrated HRM approaches in logistics, providing a framework for future policy and academic inquiry.

Keywords: Employee Performance, Motivation, Work Environment, Logistics, HRM, Warehouse Operations, Regression Analysis.



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INTRODUCTION

Human capital is increasingly recognized as a pivotal component in enhancing logistics performance outcomes, with effective human resource management (HRM) practices serving as a

cornerstone of competitiveness. Effective HRM fosters a work environment conducive to retention, engagement, and optimal utilization of skilled labor, thereby improving operational efficiency and service quality (Madhavkumar, 2023; Ogedengbe et al., 2024). As a unique and inimitable resource, human capital provides sustainable competitive advantage, enabling organizations to adapt swiftly to dynamic market demands and operational challenges.

The logistics industry faces intense competition, which drives firms to adopt flexible and innovative HRM strategies. Training, career development, and recruitment practices become central in sustaining workforce capability (Chang et al., 2021; AKKARTAL & Uludağ, 2022). Furthermore, there is a strong linkage between employee engagement and organizational performance, with engaged employees showing higher productivity, efficiency, and customer satisfaction (Judijanto & Iswanto, 2024; Mehmood et al., 2023). Beyond engagement, motivation and work environment are identified as synergistic determinants of employee performance, where recognition, compensation, and supportive working conditions jointly enhance productivity (Tumi et al., 2021; Rozi et al., 2024).

Despite the breadth of studies, research gaps remain evident. Much of the literature emphasizes general service industries or manufacturing, while specific empirical studies in logistics warehouse operations are still limited. Furthermore, prior research tends to examine either motivation or work environment in isolation, rarely integrating the two into a unified framework supported by quantitative evidence.

Accordingly, this study investigates the combined effect of work motivation and work environment on employee performance in the warehouse division of PT Aerojasa Cargo. The research employed a quantitative design with 55 employees selected using Slovin's formula, and data analyzed using SPSS regression and exploratory factor analysis. This design ensures robust reliability and construct validation. Guided by organizational behavior theory and HRM frameworks, the study seeks to answer: *To what extent do work motivation and work environment jointly influence employee performance in logistics operations?* The findings are expected to provide theoretical contribution by enriching HRM literature and practical relevance for managers to design dual-focused interventions for sustainable performance outcomes.

METHOD

This research employed a quantitative approach with descriptive and causal design, aimed at assessing both the state of employee motivation and work environment and their causal relationship with performance. Data collection was cross-sectional, gathered at a single point in time.

The population comprised 120 warehouse employees, from which 55 respondents were selected using Slovin's formula (margin of error 5%), ensuring generalizability within cost-effective

constraints (Pawirosumarto et al., 2017; KASIMU, 2018). A structured Likert-scale questionnaire (1 = strongly disagree to 5 = strongly agree) was distributed, covering three constructs:

- **Work Motivation (X1):** knowledge, skill, reward, behavioral direction, persistence.
- **Work Environment (X2):** cleanliness, collaboration, lighting, layout, air circulation.
- **Employee Performance (Y):** accuracy, timeliness, quality, quantity, neatness.

The items were derived from validated instruments in organizational behavior research. Face and content validity were assessed by academic experts. Cronbach's alpha exceeded 0.70 across all constructs, demonstrating reliability (Prasad et al., 2023).

Data analysis was conducted using **SPSS version 26.0**. Descriptive statistics captured demographic characteristics and mean scores, while inferential analysis included multiple regression and correlation tests. **Exploratory Factor Analysis (EFA)** was specifically employed to confirm the dimensionality of motivational constructs, ensuring robustness of indicators (Almawali et al., 2021). The use of SPSS ensured accessibility and reproducibility of statistical computation, while EFA validated construct structure. Normality, linearity, and multicollinearity assumptions were tested to ensure model robustness.

All respondents were informed of the research purpose, and **informed consent** was obtained prior to participation. Ethical considerations included voluntary participation, anonymity, and confidentiality. These measures ensured compliance with research ethics and enhanced the credibility of findings.

RESULT AND DISCUSSION

Respondent Demographics

The demographic profile of the 55 respondents from PT Aerojasa Cargo mirrors prevailing patterns observed in the broader Indonesian logistics sector. A large proportion of the respondents, specifically those in the 20–30 age group, highlight the industry's preference for employing younger, more agile individuals capable of handling the physical rigors of warehouse responsibilities efficiently (Baño et al., 2024). The dominance of male workers in the sample reflects traditional gender dynamics in logistics roles, although recent efforts toward gender inclusivity have contributed to a gradual increase in female participation in such roles (Islam & Islam, 2021). Educationally, most respondents possessed senior high school qualifications or equivalent, underlining a baseline level of education deemed adequate for operational logistics tasks. However, this also signals an opportunity to upskill the workforce through vocational training and higher education initiatives. The distribution of employment tenures among respondents—ranging from less than a year to over a decade—demonstrates a healthy mix of fresh perspectives and deep-rooted experiential knowledge, both of which are essential for maintaining organizational learning and agility.

Descriptive Statistics of Variables

To understand how employee perceptions varied across key organizational dimensions, this study evaluated three central variables: motivation (X1), work environment (X2), and employee performance (Y), each measured through five discrete indicators. These indicators aimed to capture the complexity and nuance of employee experiences within the workplace. Across all dimensions, mean scores ranged from 3.84 to 4.27, suggesting that respondents generally rated their workplace environment, motivational levels, and job performance positively. The indicator “reward and recognition” recorded the highest average score (mean = 4.27), underscoring the significance of acknowledgement in employee satisfaction and drive. Conversely, “air circulation” within the work environment recorded the lowest score (mean = 3.84), signaling potential discomfort in the physical workspace that may warrant infrastructural attention. Among the performance indicators, “timeliness” ranked highest (mean = 4.16), suggesting a strong cultural emphasis on punctuality and time efficiency within the organization’s operational framework.

Table 1. Mean Scores of Variables by Indicator

Variable	Indicator	Mean
Motivation (X1)	Reward and Recognition	4.27
	Knowledge	4.02
	Skill	4.06
	Direction	4.01
	Persistence	3.97
Work Environment (X2)	Cleanliness	4.08
	Collaboration	4.00
	Lighting	4.05
	Layout	3.89
	Air Circulation	3.84
Employee Performance (Y)	Timeliness	4.16
	Accuracy	4.04
	Quality	4.06
	Quantity	3.97
	Neatness	3.98

Regression Analysis

To statistically analyze the influence of the two independent variables—motivation (X1) and work environment (X2)—on the dependent variable of employee performance (Y), a multiple regression

model was developed. The analysis produced a robust coefficient of determination ($R^2 = 0.833$), which indicates that approximately 83.3% of the variance in employee performance could be accounted for by variations in work motivation and the work environment. This value surpasses commonly accepted thresholds for explanatory power in social science research, confirming the relevance of the model (Joe-Akunne et al., 2022).

The regression equation derived from the analysis is as follows: $Y = 3.663 + 0.286X_1 + 0.417X_2$

Both independent variables exhibited statistically significant positive relationships with employee performance:

- X_1 (Motivation): $\beta = 0.286$, $p < 0.05$
- X_2 (Work Environment): $\beta = 0.417$, $p < 0.05$

These results were further validated through the F-test, which returned a value of $F = 129.515$ with a p-value less than 0.001. This confirms the overall significance of the regression model and underscores the strength of the joint contribution of both predictors in influencing employee performance.

Table 2. Regression Results

Predictor	Coefficient (β)	Std. Error	t-value	p-value
Constant	3.663	0.412	8.893	0.000
Motivation (X1)	0.286	0.069	4.144	0.000
Work Environment (X2)	0.417	0.058	7.144	0.000

Interpretation

The analysis demonstrates that while both motivation and work environment significantly enhance employee performance, the work environment exhibits a marginally stronger influence. This suggests that organizational interventions aimed at optimizing environmental factors such as workspace layout, lighting, ventilation, and cleanliness may yield quicker and more tangible improvements in workforce productivity. At the same time, reinforcing intrinsic and extrinsic motivational factors—such as skill development, recognition, and goal alignment—remains vital to sustaining long-term engagement and output. These insights echo the broader findings in organizational behavior literature, which emphasize the necessity of an integrated HRM approach that simultaneously nurtures psychological and environmental dimensions (Lin et al., 2021; Mura et al., 2023).

The study's results firmly establish that both motivation and work environment serve as powerful determinants of employee performance within logistics settings like PT Aerojasa Cargo. The high R^2 value and the statistical significance of all variables reinforce the reliability of the findings. Consequently, HR professionals and organizational leaders are encouraged to adopt comprehensive strategies that address both motivational and environmental levers to foster

sustainable improvements in workforce performance. Such dual-focused HR practices not only enhance day-to-day operational outcomes but also strengthen long-term employee satisfaction, retention, and organizational resilience

Comparison of R^2 in HRM Research in Logistics

The R^2 value of 0.833 observed in this study exceeds commonly reported thresholds in HRM research, particularly within logistics, where values typically range from 0.40 to 0.70. Studies exhibiting higher R^2 values, such as those analyzing high-performance work systems (HPWS), often suggest that a well-structured HRM framework contributes strongly to variations in employee performance (Aljuaid, 2025). Conversely, research focusing on perceived HR practice effectiveness may yield lower R^2 scores due to the subjective nature of employee perceptions (Beijer et al., 2019). Thus, while a high R^2 reflects strong model fit, interpretation should be contextualized within the study design and variables employed.

Evidence Supporting the Synergy of Motivation and Work Environment

Substantial empirical evidence underscores the interaction between motivation and a conducive work environment. Studies demonstrate that environments characterized by supportive leadership, trust, and recognition foster increased motivation and engagement (Fabi et al., 2015; Madera et al., 2017). Reutzel et al. (2016) and Priyashantha (2022) provide additional support for the notion that aligned job resources and cultural support mechanisms stimulate organizational commitment. Moreover, the Job Demands-Resources (JD-R) model confirms that balanced work environments can amplify intrinsic motivation and minimize burnout, contributing positively to performance outcomes (Demerouti & Bakker, 2022).

Prioritization of Interventions Based on Regression Outcomes

From the regression results, work environment ($\beta = 0.417$) has a slightly greater effect on employee performance than motivation ($\beta = 0.286$). These insights should inform HR decision-making by emphasizing targeted improvements in physical layout, lighting, and organizational climate. At the same time, enhancing motivational factors like recognition, autonomy, and growth opportunities is also critical. According to Beijer et al. (2019) and Sung & Choi (2018), HR professionals can derive strategic intervention points from statistically significant predictors to guide effective policy formulation.

Strategies to Enhance Motivation and Work Setting

To concurrently elevate motivation and work environment quality, organizations should invest in high-performance work systems that include continuous training, participatory decision-making, and leadership development (Demir et al., 2023; Fabi et al., 2015). Flexible scheduling, ergonomic workspace design, and psychological safety initiatives also enhance the dual domains. Feedback loops through regular employee surveys can serve as a monitoring tool to ensure these interventions remain relevant and effective over time (Aljuaid, 2025). Ultimately, this dual-focused approach fosters a resilient organizational culture that promotes both performance and employee well-being.

This discussion highlights the significance of high explanatory power in regression analysis, the interconnectedness of motivation and work environment, and the strategic application of these insights in HRM. By leveraging statistically backed evidence, logistics firms can make informed decisions to create supportive and motivating environments that drive sustained employee performance.

CONCLUSION

This study examined the influence of work motivation and work environment on employee performance in PT Aerojasa Cargo's warehouse division. The findings confirmed that both variables exert statistically significant positive effects on employee performance. The regression analysis revealed a high explanatory power ($R^2 = 0.833$), indicating that 83.3% of the variance in performance could be explained by motivation and work environment factors.

From the results, work environment emerged as a slightly stronger predictor of performance than motivation. This suggests that immediate operational improvements may be more efficiently achieved through interventions targeting physical workspace optimization and organizational climate enhancements. Nevertheless, motivation also plays a pivotal role, particularly in reinforcing persistence, skill development, and job satisfaction.

Demographic analyses provided further insights, revealing trends such as a youthful workforce, gender disparities, and education-linked differences in performance outcomes. These factors have strategic implications for HR policy design and highlight the need for customized interventions that consider employee backgrounds and career stages.

The scientific contribution of this study lies in its integrated analysis of two critical HR dimensions—motivation and work environment—and their combined influence on logistics sector performance. By linking theory with empirical data, the research reinforces existing literature while offering actionable guidance for HR practitioners aiming to improve productivity and employee engagement.

Future research should consider expanding the sample size, exploring longitudinal effects, and integrating qualitative methods to capture nuanced employee experiences. Additionally, examining moderating variables such as leadership style or organizational culture may further enhance understanding of HRM effectiveness in logistics settings.

Ultimately, the study underscores the importance of dual-focused HR strategies that simultaneously elevate motivation and cultivate a supportive work environment, paving the way for sustainable organizational success in service-intensive industries like logistics.

REFERENCE

- Agustian, K., Pohan, A., Zen, A., Wiwin, W., & Malik, A. (2023). Human resource management strategies in achieving competitive advantage in business administration. *Journal of Contemporary Administration and Management (Adman)*, 1(2), 108-117. <https://doi.org/10.61100/adman.v1i2.53>
- Akinsola, T., Abubakar, H., Akande, J., & Adekunle, A. (2024). Effect of motivational strategies on employee performance in Nigerian deposit money banks. *International Journal of Professional Business Review*, 9(2), e04365. <https://doi.org/10.26668/businessreview/2024.v9i2.4365>
- AKKARTAL, G., & Uludağ, C. (2022). Evaluation of competition strategies applied in logistics management during the pandemic process: a research on logistics companies in Istanbul. *Business and Management Studies: An International Journal*, 10(4), 1293-1304. <https://doi.org/10.15295/bmij.v10i4.2140>
- Aljuaid, A. (2025). Achieving logistics firm performance through high-performance work system (HPWS) and e-HRM capabilities: The moderating role of digital talent acquisition. *SAGE Open*, 15(1). <https://doi.org/10.1177/21582440241310306>
- Almawali, H., Hafit, N., & Hassan, N. (2021). The mediating effects of employee engagement on motivational factors and job performance. *International Journal of Academic Research in Business and Social Sciences*, 11(12). <https://doi.org/10.6007/ijarbss/v11-i12/11948>
- Aseanty, D., & Anggriani, A. (2023). The influence of psychological capital, job satisfaction, and employee engagement on job performance on employees of freight forwarder companies in Jakarta. *Eduvest - Journal of Universal Studies*, 3(9), 1754-1768. <https://doi.org/10.59188/eduvest.v3i9.942>
- Bailey, C., Madden, A., Alfes, K., & Fletcher, L. (2015). The meaning, antecedents and outcomes of employee engagement: A narrative synthesis. *International Journal of Management Reviews*, 19(1), 31-53. <https://doi.org/10.1111/ijmr.12077>
- Baño, A., Khatun, A., & Kumar, D. (2024). Examining drivers of engagement and employee engagement in relation to organizational performance – A study of banking sector in Hyderabad City. *Migration Letters*, 21(S3), 1067-1081. <https://doi.org/10.59670/ml.v21is3.6887>
- Beijer, S., Peccei, R., Veldhoven, M., & Paauwe, J. (2019). The turn to employees in the measurement of human resource practices: A critical review and proposed way forward. *Human Resource Management Journal*, 31(1), 1-17. <https://doi.org/10.1111/1748-8583.12229>
- Belikov, A., & Жырбенко, B. (2024). The lighting environment assessment based on occupational safety, performance and psycho-physiological health of people who perform high visual

- complexity work. *Naukovyi Visnyk Donetskoho Natsionalnogo Tekhnichnogo Universytetu*, 15(12), 33-42. <https://doi.org/10.31474/2415-7902-2024-1-12-33-42>
- Bhatti, M., Mat, N., & Juhari, A. (2018). Effects of job resources factors on nurses job performance (mediating role of work engagement). *International Journal of Health Care Quality Assurance*, 31(8), 1000–1013. <https://doi.org/10.1108/ijhcqa-07-2017-0129>
- Chang, C., Lu, C., & Lai, P. (2021). Examining the drivers of competitive advantage of the international logistics industry. *International Journal of Logistics Research and Applications*, 25(12), 1523–1541. <https://doi.org/10.1080/13675567.2021.1915263>
- Costa, R., Souza, T., Barros, B., Silva, V., Freitas, E., & Simões, A. (2023). Logistics management: A future perspective on logistics processes with the application of the 5S method at BRAMAM Company in Parintins, Amazonas. *ITEGAM - Journal of Engineering and Technology for Industrial Applications (JETIA)*, 9(44). <https://doi.org/10.5935/jetia.v9i44.1010>
- Cui, X. (2023). Organizational commitment, self-efficacy and work engagement among Chinese employees in foreign IT companies: Basis for improved work performance framework. *International Journal of Research Studies in Management*, 11(7). <https://doi.org/10.5861/ijrsm.2023.1086>
- Demerouti, E., & Bakker, A. (2022). Job demands-resources theory in times of crises: New propositions. *Organizational Psychology Review*, 13(3), 209–236. <https://doi.org/10.1177/20413866221135022>
- Demir, G., Chatterjee, P., Zakeri, S., & Pamučar, D. (2023). Mapping the evolution of multi-attributive border approximation area comparison method: A bibliometric analysis. *Decision Making Applications in Management and Engineering*, 7(1), 290–314. <https://doi.org/10.31181/dmame7120241037>
- Fabi, B., Lacoursière, R., & Raymond, L. (2015). Impact of high-performance work systems on job satisfaction, organizational commitment, and intention to quit in Canadian organizations. *International Journal of Manpower*, 36(5), 772–790. <https://doi.org/10.1108/ijm-01-2014-0005>
- Gomes, A., Lima, F., Soliani, R., Oliveira, P., Oliveira, D., Siqueira, R., ... & Macedo, J. (2023). Logistics management in e-commerce: Challenges and opportunities. *Revista De Gestão E Secretariado*, 14(5), 7252–7272. <https://doi.org/10.7769/gesec.v14i5.2119>
- Goto, E., Ishikawa, H., Okuhara, T., Ueno, H., Okada, H., Fujino, Y., ... & Kiuchi, T. (2020). Presenteeism among workers: Health-related factors, work-related factors and health literacy. *Occupational Medicine*, 70(8), 564–569. <https://doi.org/10.1093/occmed/kqaa168>
- Hadian, D. (2022). Effect of employee engagement and continuance commitment on employee performance. *Jurnal Computech & Bisnis*, 16(1), 35. <https://doi.org/10.56447/jcb.v16i1.269>

- Huma, S., Ahmed, W., Ikram, M., & Khawaja, M. (2019). The effect of logistics service quality on customer loyalty: Case of logistics service industry. *South Asian Journal of Business Studies*, 9(1), 43–61. <https://doi.org/10.1108/sajbs-10-2018-0114>
- Ichdan, D., Maryani, M., & Yuliansyah, Y. (2023). Participation in decision-making, career development, and organizational commitment. *Jurnal Ilmiah Akuntansi Dan Bisnis*, 18(2), 342. <https://doi.org/10.24843/jiab.2023.v18.i02.p10>
- Islam, M., & Islam, S. (2021). Impact of employee engagement on organizational commitment and performance: A review of private companies in Bangladesh. *Dhaka University Journal of Business Studies*, 41–58. <https://doi.org/10.3329/dujbst.v42i1.59959>
- Jin, M., & McDonald, B. (2016). Understanding employee engagement in the public sector: The role of immediate supervisor, perceived organizational support, and learning opportunities. *The American Review of Public Administration*, 47(8), 881–897. <https://doi.org/10.1177/0275074016643817>
- Joe-Akunne, C., Edosomwan, H., & Gladness, S. (2022). Participation in decision-making and perceived organizational support as predictors of psychological safety among secondary school staff. *Asian Research Journal of Arts & Social Sciences*, 46–55. <https://doi.org/10.9734/arjass/2022/v17i230305>
- Joo, B., & Lee, I. (2017). Workplace happiness: Work engagement, career satisfaction, and subjective well-being. *Evidence-Based HRM: A Global Forum for Empirical Scholarship*, 5(2), 206–221. <https://doi.org/10.1108/ebhrm-04-2015-0011>
- Judijanto, L., & Iswanto, J. (2024). Analysis of the impact of HR development policies, work culture, and organizational performance on competitive advantage in the manufacturing industry in Indonesia. *WSSHs*, 2(03), 391–400. <https://doi.org/10.58812/wssh.v2i03.707>
- KASIMU, N. (2018). Effect of human resource factors on employee performance in state parastatals: A case study of Kenya Power Limited - Mombasa. *Strategic Journals*, 5(2). <https://doi.org/10.61426/sjbcm.v5i2.688>
- Lin, C., Efranto, R., & Santoso, M. (2021). Identification of workplace social sustainability indicators related to employee ergonomics perception in Indonesian industry. *Sustainability*, 13(19), 11069. <https://doi.org/10.3390/su131911069>
- Liu, X., Yu, J., Guo, Q., & Li, J. (2022). Employee engagement, its antecedents and effects on business performance in hospitality industry: A multilevel analysis. *International Journal of Contemporary Hospitality Management*, 34(12), 4631–4652. <https://doi.org/10.1108/ijchm-12-2021-1512>