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# The Relationship Between Remote Work and Employee Productivity in A Tech Company

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**ABSTRACT**

This study examines the impact of remote work on employee productivity within PT. HLM, a technology company in Indonesia specializing in software development and IT consulting that has implemented a full remote work model since 2020. The research focuses on three key factors—work autonomy, collaboration quality, and work environment—motivated by the rising adoption of remote work and the need to identify conditions that sustain productivity. Grounded in Self-Determination Theory, Media Richness Theory, and Environmental Psychology, the study highlights challenges such as maintaining communication, managing flexible work hours, and creating supportive home workspaces. A quantitative survey was conducted with 50 employees, employing Likert-scale items to measure the independent variables and productivity. Validity and reliability tests confirmed the robustness of the instruments, while regression analyses revealed that work autonomy and collaboration quality significantly and positively predict remote work productivity. In contrast, the physical work environment showed a weaker, non-significant effect. Additional findings highlight barriers in virtual collaboration, including communication delays and reduced informal interactions. The study concludes that enhancing flexible work policies, improving collaboration tools, supporting employee well-being, and promoting hybrid social engagement activities can strengthen productivity in remote work settings. These findings contribute to both organizational practice and academic literature by offering strategies to optimize remote work effectiveness, with implications for sustaining long-term employee performance in technology-driven workplaces.

**KEYWORDS** Remote work, Employee productivity, Work Autonomy, Collaboration Quality, Work Environtment.



## INTRODUCTION

The term remote work originally appeared in Norbert Wiener's 1950 book The Human Use of Human Beings: Cybernetics and Society, which also introduced the term telework. The word telecommute was first used in 1974 in a report by the University of Southern California on a National Science Foundation-funded reduction study. Working remotely became popular in the latter part of the twentieth century with the development of communication technologies and personal computers (Lakshmi et al., 2023; Paudel & Sherm, 2024; Popovici & Popovici, 2020; Saunders et al., 2019; Ter Hoeven & Van Zoonen, 2020).

The shift to remote work has become a global phenomenon, significantly accelerated by the COVID-19 pandemic. This transition has reshaped the traditional work environment, impacting employee productivity and collaboration, particularly in the tech industry (Counts, 2021). Remote work offers flexibility and can enhance short-term productivity, but it also presents challenges such as reduced collaboration, innovation, and employee engagement (Bistak et al., 2024; Flores, 2019; Popovici & Popovici, 2020; Wontorczyk & Rożnowski, 2022). While remote work enabled both flexibility and operational continuity, it raised questions about its overall impact on productivity and collaboration (Castañed, 2022).

In Indonesia, tech companies adopted remote work during the pandemic to maintain operations, though they faced unique challenges due to varying levels of digital infrastructure and cultural differences in work practices (Dingel & Neiman, 2020). Approximately 70% of tech companies adopted hybrid/remote work models post-2020 (Cooke, 2021).

The COVID-19 pandemic has significantly changed how companies operate worldwide, including in Indonesia. Many enterprises were required to implement remote working arrangements to comply with government regulations for social distancing. By 2022, with the peak of the pandemic having passed, the government opted to relax most COVID-19 restrictions, including social distancing and movement limitations. This reopening sparked national debates over whether employees should return to offices or be allowed to continue working remotely.

Remote working arrangements refer to setups in which employees work from a location outside the office, such as their home. Hybrid working arrangements combine office-based work with remote work, while onsite working arrangements involve employees working exclusively within office settings (Allen, 2013; Bekelev & Yohannes, 2022; Bloom et al., 2015; Bolino & Grant, 2016; Chatterjee & Simonoff, 2013).

In Indonesia, few empirical studies have quantitatively or qualitatively examined remote or hybrid work and their effects on productivity, collaboration, and engagement. For instance, Susilo (2020) empirically assessed the effect of Work-From-Home (WFH) on job performance across Indonesia, using work environment, job satisfaction, and work motivation as mediators. However, this study did not focus on the tech industry or examine collaboration quality. Similarly, Ismail & Sekarsari (2022) investigated remote work productivity in Indonesia by analyzing how technostress and work–life balance influence adaptation, but their sample spanned multiple sectors and did not isolate collaboration or autonomy variables in tech firms (JakPat, 2023).

In the public sector, a study at OJK (Financial Services Authority) found that WFH positively influences performance through adaptive work culture, though this was in a regulatory and financial context rather than in tech development. Another

study, Impact of Remote Working on Employee Productivity During COVID-19 in Indonesia, used PLS-SEM with 150 respondents across industries. It explored workload, job satisfaction, work–life balance, and cultural adaptability but did not specifically examine the role of work environment or collaboration quality in a tech firm setting.

While these studies enrich the understanding of WFH impacts in Indonesia, they remain limited in industry focus, variable scope, and contextual depth. None directly address how remote work arrangements influence productivity, collaboration quality, and work autonomy in Indonesian tech companies, where culture, infrastructure, and communication norms differ significantly from financial or public sector contexts. Therefore, this research aims to fill that normative-to-empirical gap by operationalizing and empirically testing key variables within a tech firm (PT. HLM). The objective is to examine how work autonomy, collaboration quality, and work environment predict remote work productivity in PT. HLM, with the benefit of providing actionable insights and evidence-based strategies for Indonesian tech firms to sustain high productivity under remote or hybrid arrangements.

## RESEARCH METHOD

The third aspect of this research was the methodology, which included data collection, research methods, and analysis (Creswell, 2019). The study followed a systematic, multi-step approach, beginning with the identification of the business issue and research objectives related to remote work and productivity. It incorporated a literature review to ground the research in existing theories such as Self-Determination Theory, Media Richness Theory, and Environmental Psychology.

A structured survey was distributed to employees and managers at PT. HLM across Indonesia using Google Forms, accessible only to company participants. The survey used Likert-scale questions. Data from 50 respondents were analyzed using IBM SPSS version 26.0 and Microsoft Excel version 16.44. The analysis employed both descriptive and inferential statistical techniques. Descriptive statistics summarized participant demographics, such as length of employment and domicile, and responses related to the independent variables: Work Autonomy, Collaboration Quality, and Work Environment, as well as the dependent variable, Remote Work Productivity.

Inferential statistics were then used to examine the relationships between the three independent variables and Remote Work Productivity. Correlation analyses assessed the strength and direction of the associations among variables, while multiple linear regression tested the predictive effects of Work Autonomy, Collaboration Quality, and Work Environment.

This research focused on quantitative methods to statistically measure the relationship between remote work and employee productivity. The use of surveys provided structured data that could be analyzed numerically, ensuring objectivity and reliability in the findings. A prior study titled The Impact of Remote Work on Employee Productivity: A Study of IT Companies in Silicon Valley (Thompson, 2024), which used questionnaires and statistical analysis to measure productivity, job satisfaction, and work–life balance, further supported the effectiveness of quantitative approaches.

The use of multiple regression analysis was chosen to investigate the simultaneous effects of Work Autonomy, Collaboration Quality, and Structured Work Environment on Remote Work Productivity. This approach was ideal for determining the individual and collective influence of multiple predictors on the outcome.

## RESULT AND DISCUSSION

### Descriptive Analysis

Descriptive Statistics help to summarize and organize data but doesn't test hypotheses only provides essential information about data's objectives. The descriptive statistics provide an understanding of employee perceptions and experiences related to remote work at PT. HLM. Employee generally report positive autonomy and collaboration experiences, supported by Structured work environment, which correspond with relatively high self-reported productivity levels. The demographic data also shows a diverse workforce spread across multiple regions in Indonesia, adding context to the survey results.

**Table 1. Summary of Key Variables**

| Variable | Mean | Std Deviation | Minimum | Maximum |
|---|---|---|---|---|
| Work Autonomy | 19.96 | 2.37 | 13 | 25 |
| Collaboration Quality | 20.02 | 4.78 | 1 | 25 |
| Work Environment | 19.31 | 3.39 | 9 | 25 |
| Remote Work Productivity | 20.12 | 2.92 | 8 | 25 |

Work Autonomy: The average score is approximately 20 out of a possible 25, indicating that employees generally feel they have a good level of control over their work schedules and methods. The standard deviation of 2.37 suggests moderate variability among respondents. Collaboration Quality: The mean score is around 20, but with a larger standard deviation (4.78), indicating more diverse experiences

in communication effectiveness and tool usage. The wide range (1 to 25) suggests some employees perceive poor collaboration quality while others rate it highly.

Structured Work Environment: Scores average about 19.3, with moderate variability. The minimum score of 9 indicates some employees face challenges with their remote work setup or environment.

Remote Work Productivity: The average productivity score is about 20, with a standard deviation of 2.92, suggesting most employees feel productive working remotely, though some variability exists.

**Demographic Distribution**

Table 2 presents the distribution of respondents by domicile, illustrating the geographic diversity of PT. HLM's remote workforce.

**Table 2. Demographic Distribution**

| Domicile | Frequency | Percentage (%) |
|---|---|---|
| Jakarta | 14 | 26.5 |
| South Tangerang | 5 | 10.2 |
| Depok | 2 | 4.1 |
| North Sumatra | 2 | 4.1 |
| Yogyakarta | 2 | 4.1 |
| Others (Various) | 25 | 51.0 |
| **Total** | 50 | 100 |

Based on the table above we can see that The largest concentration of employees is in Jakarta (26.5%), followed by Tangerang Selatan (10.2%). The rest are spread across various cities, showing a geographically diverse workforce. The majority of respondents are located in Jakarta, representing over a quarter of the sample, followed by Tangerang Selatan and other regions. The demographic distribution analysis reveals that the respondents come from 26 unique domiciles, showcasing a diverse geographical representation. This diversity is crucial as it ensures that the findings of the study are reflective of employees' experiences across different regions, providing a comprehensive understanding of remote work dynamics. This geographic spread provides a broad representation of the company's remote employees across Indonesia; this diversity supports the generalizability of findings within the company's remote work setting.

Implications of Geographical Diversity

The geographical diversity of the respondents is significant for several reasons:

Varied Infrastructure: Different regions have varying levels of digital infrastructure, which can impact remote work experiences. For example, major

cities like Jakarta and Bandung may have more reliable internet connectivity compared to smaller regions.

**Period of working in the company**

Table 3. presents the distribution of respondents by domicile, illustrating the geographic diversity of PT. HLM's remote workforce.

**Table 3. Period of Working**

| Tenure (Years) | Frequency | Percentage (%) |
|---|---|---|
| 1-3 | 18 | 36.7 |
| 3-5 | 13 | 24.5 |
| 5-7 | 10 | 20.4 |
| 7-11 | 1 | 18.4 |
| **Total** | 50 | 100 |

Based on the table above, the distribution of respondents based of their working period in PT. HLM. Most employees with percentage of 36.7% have been with the company for 3 years, suggesting a relatively entry level of personnel. Around 24.5% have between 3 and 5 years of experience, while 20.4% and 18.4% have been employed for 5 to 7 years and to 7 to 11 years, indicates a stable core of a longer serving employees. This distribution suggests balanced mix of newer and longer experienced employees, which may influence their experience and productivity in a remote work setting.

**Working arrangement and Remote Work Productivity**

In this section we will elaborate on the research's key findings, which analyzed the relationship between various working arrangements (Work Autonomy, Collaboration Quality and Structured Work environment) and Remote Work productivity in PT. HLM. The analysis started with a comparison of means compared to the average of remote work productivity of each independent variable and average of all samples (4.05) as the overall mean; this can be constructed:

1. Work Autonomy: With mean score of around 3.85 suggests that employees in PT. HLM generally perceive a moderately high level of control over their work schedules and task management while working remotely.
2. Collaboration Quality: With mean score near 3.90, employees report positive experiences with team communication and collaboration tools. The variability suggests how some employees have differences in experiencing collaboration.
3. Structured Work Environment: Mean score around 3.75 indicates a general perception of workspace quality and adherence to core hours are lower than autonomy and collaboration.

**Proposed Business Solution**

Proposes business solutions that the company can implement or used in the future to enhance more productivity in remote work setup. The proposed solution will align with Hypothesis above like Work Autonomy and Collaboration Quality that both have significant validity or help remote work productivity in PT. HLM. Also, in the questionnaire that researchers shared, researchers also give participants chance to share their thoughts and advice for future reference.

Based on the regression above we can see that structured work environment has significant effect on productivity, but the coefficients is minus, that's why researcher propose to PT. HLM create a workspace program for their employees to ensure employees have a dedicated, ergonomic and distraction-free workspace. First step is to audit employees' workspace from HR in virtual setting, then HR will create guidelines for proper home office setup to develop a standard guide for ideal home workspace, from chair, desk and room lighting. Lastly PT. HLM should provide financial assistance for employees to purchase ergonomic chairs, desks, monitor stands and other items that employees need to optimize their workspace.

**Promoting Health and Well-being benefits**

Support Work Autonomy by encouraging employees to manage their work-life balance proactively. Flexible breaks and wellness programs help maintain energy and focus, which are necessary for autonomous work. Furthermore, mental health resources and routines like dressing for work help employees establish boundaries and self-regulate their productivity. Healthy employees are more capable of engaging in high-quality collaboration, as mental well-being fosters better communication, empathy, and teamwork (Wang et al., 2021). Having mental health talk session or workshops will also help employee to gain new insight and stay out of their routinary for a while to take a deep breath and rest their mind like an hour or so, also encouraging the employees to have routine workout or create a sports club even though virtual setup can help employee more engage and feels connected with each other.

**Provide Hybrid work models**

Hybrid arrangements provide a balance between autonomy and collaboration. Employees gain the freedom to choose when and where they work, enhancing Work Autonomy by allowing them to optimize their productivity rhythms and personal circumstances (Choudhury et al., 2020). At the same time, scheduled in-office days facilitate spontaneous interactions and richer collaboration, addressing the limitations of virtual communication and strengthening team bonds. This flexibility supports both individual motivation and team effectiveness, key drivers of remote

work success. Making this not mandatory will help employees not to feel burden especially the one who lives outside of head office or in Jakarta. This will also help if there are team members that need to be supervised more, the management can make it mandatory for them to come to the office so their leader can watch and evaluate their work regularly. But if employees who's thriving and also choose to work remotely then it's fine too.

**Continuous learning and creating formal monitoring**

Regular knowledge-sharing sessions and performance reviews help maintain alignment and provide structure without undermining autonomy. In technology companies where everything moves rapidly, having shared knowledge under each division will help each other to stay on track or gain insight what's trending right now, maybe we can do mini projects for internal users too. For Work Autonomy, clear goals and feedback empower employees to self-manage and improve their work processes. Giving employees something like KPI/OKR will help them more focus on their goals and what needs to be done since PT. HLM doesn't have formal measurements for that. For Collaboration Quality, ongoing communication and shared learning foster a culture of openness and continuous improvement, enhancing team coordination and problem-solving capabilities.

**Increase benefits**

Other than monthly take home pay, researchers think PT. HLM should give more benefits to their employees, especially since they usually work overtime. Benefits such as medical insurance that's good and can be used widely, annual medical checkups, overtime benefit (such as reimbursement of food or money, or both if need to work overtime in weekend too) and upgraded tools (such as monitor, or ergonomic desk or chair) or services (such as paid application) that help with their everyday task also they can also provide voucher and reimbursement if employees want to have courses or workshop that align with their job description, with feedback the employees need to shared what they gain through the courses or workshop then it will conduct virtual sharing session and retain engagement between one employee and the other.

## CONCLUSION

This study found that remote work productivity at PT. HLM was strongly influenced by work autonomy and collaboration quality, while the structured work environment showed a weaker and statistically insignificant effect. The results highlight that psychological and social factors—such as control over tasks and effective digital communication—are more critical to productivity than physical workspace characteristics, with work autonomy emerging as the strongest

predictor. For future research, it is suggested to extend empirical testing across industries and larger samples in Indonesia, while incorporating mediating factors such as employee engagement, digital literacy, and technostress, as well as comparing hybrid and fully remote contexts to develop broader generalizations and practical strategies for optimizing remote work effectiveness.

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