

Analysis hybrid working, performance effectivity, and employee's collaboration

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Abstract: This study examines the influence of hybrid working on performance effectiveness and employee collaboration at PT. XYZ. We employed probability sampling via cluster randomized sampling to select respondents from seven business units. Primary data collection involved observation, interviews, and Google Form questionnaires. We adopted a quantitative approach utilizing correlation analysis and hypothesis testing. The study uncovered a robust correlation between hybrid working and performance effectiveness, contributing significantly to both performance and collaboration. Male employees demonstrated higher performance effectiveness than females, despite a moderate correlation. However, female employees still exhibited notable performance effectiveness, attributed to work-life balance. Departments that were adaptable to technology and less reliant on hardcopy methods showed heightened performance effectiveness. The findings underscore the importance of embracing hybrid working arrangements for improved performance effectiveness and enhanced collaboration. We encourage organizations to implement and optimize hybrid work policies to reap these benefits. Prioritizing work-life balance, particularly for female employees, is crucial for fostering satisfaction and productivity. Additionally, investing in technological infrastructure and providing training can enhance performance effectiveness by enabling proficient use of digital tools and platforms.

Keywords: Collaboration, Hybrid working, Performance effectivity.

1. Introduction

In the early 2020, COVID-19 virus, which is increasing in all over the world, including Indonesia, will cause a large alteration in many sectors such as education, economics, social, political, culture, and technology. Almost all companies in Indonesia must do the unusual things in order to survive, like lying off employees, cutting off the employee's salary also changing the employee's working system. Finally, companies that would like to preserve the employee, have to innovate in order to have good mobility and keep the employee's safety. One of the ways is by applying a combination working system, which is known as hybrid working, where employees could choose the time and place to work with the usual working proportion of three days from home and two days from office [1].

The 2021 Accenture study revealed that 83 percent of 9,326 global employees regarded hybrid working, with 25 percent working remotely, as the optimal working arrangement due to its potential to reduce stress [2]. Similarly, a McKinsey survey from January 2021 revealed a significant interest in hybrid working post-pandemic, with 52 percent of employees preferring it over full-time office work (37 percent) or full-time remote work (11 percent) (WFH) [3]. These findings highlight the increasing appeal of hybrid working as a new system, driven by its perceived benefits such as increased job flexibility and better work-life balance.

One of the important roles in applying hybrid work is the use of technology. According to Gartner's August 2021 survey, nearly 80 percent of employees utilized collaboration tools to enhance team

productivity [4]. Consequently, companies must adapt to these new technological demands by integrating various collaboration platforms such as Zoom, Webex, Google Meet, Microsoft Teams, Trello, Human Resource Information System (HRIS), and others. These tools support employee performance and facilitate collaboration across different levels of management, departments, and teams within the company. Additionally, findings from the Remote Work and Compensation Pulse Survey conducted by Apollo Technical in May 2021 revealed that 51 percent of companies favored the adoption of a hybrid working model over full-time remote work [5].

PT. XYZ, a prominent company in Indonesia, has adopted a hybrid working model to prioritize the health and safety of its employees. Established in 1953, PT. XYZ has grown to employ nearly 30,000 individuals across various sectors, including food, insurance, property, manufacturing, energy, media, and technology. In response to the challenges posed by the COVID-19 pandemic, the company initially transitioned to full work-from-home arrangements for all employees across its business units in 2020, spanning both headquarters and satellite locations. Over time, PT. XYZ has adapted its remote work policies to align with the diverse needs of its business units and departments. Certain critical units, particularly those in manufacturing and finance, faced limitations in implementing full remote work due to operational requirements.

Subsequently, in 2021, the company introduced a phased approach, permitting employees to work in-office to a limited extent based on the prevailing level of *PerberlakuanPembatasanKegiatan Masyarakat* (PPKM), or community activity restriction enforcement. This framework permitted employees to combine office and remote work days, adjusting the allocation based on the severity of the PPKM level. For instance, during PPKM level 25 percent, employees engaged in one day of work from the office (WFO) and four days of work from home (WFH). We modified the balance between WFO and WFH days as PPKM levels increased. Since 2022, PT. XYZ has implemented standardized regulations, allowing employees to work in-office for four days and remotely for one day, with the flexibility for customization based on approval from department heads.

Initially, PT. XYZ faced several hurdles during the implementation of hybrid working. The foremost challenge revolved around documentation and communication. To begin with, employees had to adapt to a new system for organizing and accessing documents. This transition involved moving from relying on physical documents available in the office to managing digital files, which required the conversion of hardcopies into scanned documents for remote access. Additionally, employees had to acquaint themselves with new collaboration tools crucial for virtual meetings and remote work support. This technological adjustment process demanded significant time and effort from the employees as they adapted to these changes. On the company's end, the primary obstacle was managing the server effectively.

Ensuring the stability of the main server was imperative to facilitate seamless communication through email, collaboration tools, and during meetings. As the company navigated through this learning curve, both employees and the organization adapted to the new challenges. Despite limited face-to-face interactions, collaboration between top management, employees, and cross-departmental teams remained effective. Moreover, despite reduced supervision, the company successfully evaluated individual and teamwork performance and talent during hybrid working arrangements. The previous study found that hybrid working contributes to performance effectiveness and employee's collaboration [6-10].

In the other study, it was also found that hybrid working had no contribution to effectivity performance or employee's collaboration [11-15]. This study seeks to address this gap by investigating whether hybrid working enhances performance effectiveness and fosters employee collaboration, thereby providing valuable insights for organizations navigating the evolving landscape of remote and office-based work arrangements.

Based on the above contradictory condition, this study attempts to answer (1) Does hybrid working contribute to performance effectivity? (2) Does hybrid working contribute to employee's collaboration?

2. Literature Review

2.1. Performance Effectivity

The concept of performance effectiveness involves assessing the organization's accomplishments by comparing the implementation process, job allocation, and delegation of authority with the outcomes and individual achievements. This evaluation encompasses quantitative, qualitative, and temporal aspects aimed at maximizing the organization's goals, purposes, vision, and mission within legal and ethical boundaries [16-19]. This study employed three key performance effectiveness indicators: target accuracy, utilization strategy, and resource management. Target accuracy assesses an employees' ability to effectively complete assigned tasks in alignment with organizational objectives. Utilization strategy focuses on empowering employees to execute their responsibilities diligently and judiciously, ensuring timely task completion. Resource management is about optimizing outcomes by efficiently utilizing available tools and infrastructure [16, 17].

2.2. Employee's Collaboration

In this study, collaboration is described as a situation or process where two or more individuals collaborate to find solutions and overcome obstacles, ultimately achieving both individual and organizational goals [20-24]. We examined three primary indicators of employee collaboration: cooperation, contribution, and communication. Cooperation involves promoting effective teamwork by encouraging task-sharing, collaborative problem-solving and mutual understanding among team members, thus fostering a unified approach to task completion. Contribution highlights the active involvement of employees in sharing ideas, taking on responsibilities, and acknowledging the importance of each team member's input, promoting a sense of ownership and collective success. Communication aims to facilitate clear and efficient information exchange among team members, both directly and indirectly, to ensure alignment towards common goals and objectives [20-22].

2.3. Hybrid Working

Hybrid working, as defined by companies, denotes a flexible work model enabling employees to operate without rigid limitations on time and location [25-28]. Experts delineate multiple forms of hybrid working arrangements, encompassing flexible schedules and telecommuting, office-based work with adaptable location choices, and diversifications in working hours [25-27]. The integration of hybrid working presents several advantages, including cost reductions, heightened efficiency and productivity, enriched recruitment prospects, and bolstered employee safety [26, 27]. However, it also presents challenges, including potential impacts on team collaboration, decreased employee engagement, reliance on collaboration tools, and reduced visibility of employees [9, 25, 26]. This study employed three indicators of hybrid working: time management, adaptation, and commitment. Time management involves effectively utilizing working hours to complete tasks and responsibilities. Adaptation ensures employees can adjust to changes in work culture and innovate in problem-solving. Commitment focuses on employees fulfilling their duties with dedication and reliability, without a propensity for absenteeism during working hours [9, 25-27].

2.4. Framework and Hypothesis

The framework of analysis of hybrid working, performance effectivity, and employee's collaboration shown in [Figure 1](#).

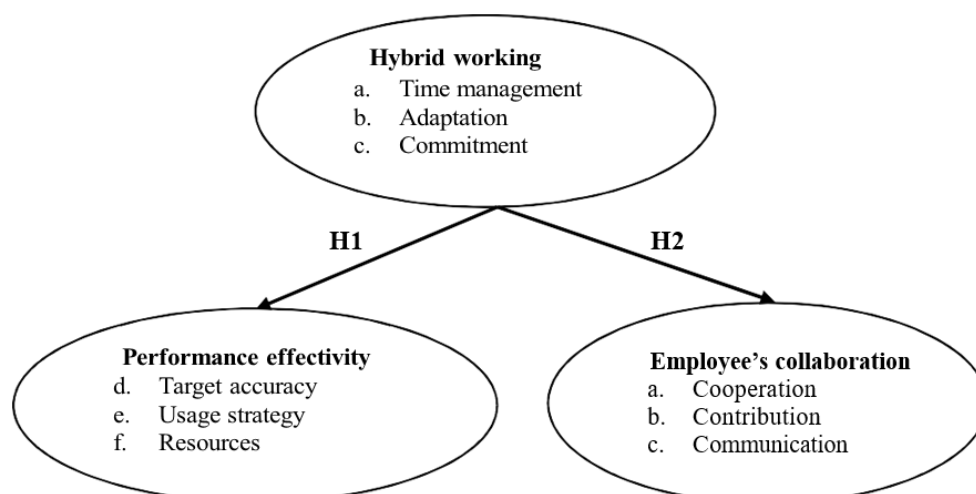


Figure 1.
Framework.

Based on the above framework, there are two hypotheses in this study, consisting of:

H1: Hybrid working contributes to performance effectivity at PT. XYZ.

In this study, hybrid working is identified as a contributing factor to performance effectiveness due to its influence on working conditions. Flexible working, also known as hybrid or combination working, grants employees the freedom to determine their own working hours. This flexibility is particularly beneficial for female employees, as it fosters work-life balance, leading to increased productivity, motivation, and reduced rates of absenteeism and turnover.

H2: Hybrid working contribute to employee's collaboration at PT. XYZ.

This study identifies hybrid working as a significant factor that contributes to employee collaboration, primarily due to its influence on communication practices. Effective communication plays a crucial role in fostering successful collaboration, as it facilitates the exchange of ideas and information necessary for teamwork. In the past, employees could easily achieve communication through direct interactions. However, with the onset of the COVID-19 pandemic, communication became limited to virtual channels, such as Zoom, Webex, Google Meet, and Microsoft Teams.

Initially, the shift to limited virtual communication posed a significant challenge, as employees had to adapt to collaborating solely through digital platforms to complete tasks and responsibilities. However, over time, this challenge transformed into a positive aspect of hybrid work. The absence of location constraints led to a decrease in employee absenteeism during meetings due to external factors like traffic conditions, and an improvement in the timely completion of tasks and responsibilities.

3. Methods

3.1. Research Design

The research design outlines the systematic and directed plan for collecting, processing, and analyzing data to efficiently and effectively achieve the research objectives [29, 30]. This study employs an inferential research approach, which involves analyzing variables through hypothesis testing to determine the truth or randomness of correlations or differences [31, 32].

3.2. Participants

This study's unit of analysis consists of employees of PT. XYZ from seven business units, including food, insurance, property, manufacturing, energy, media, and technology. The population consists of 162 employees who have been implementing hybrid working from 2020 to 2022.

3.3. Sampling Technique

Probability sampling, specifically cluster randomized sampling, is utilized in this study, wherein each subject or unit in the population has the opportunity to be selected as a sample [31-33]. Cluster randomized sampling is chosen for its efficiency in time and cost, as it randomly selects employees of PT. XYZ rather than individual subjects [31, 34].

3.4. Data Collection

We employed observations, interviews, and a questionnaire via Google Form as primary data collection methods [35]. Research subjects or respondents provide primary data, revealing empirical facts about the studied variables [30, 31, 36]. Secondary data, obtained from books, journals, and published articles related to the research topic, are also utilized [30, 37].

3.5. Data Collection Tool

In this research, the questionnaire displays four answer choices (strongly agree, agree, disagree, strongly disagree) for data collection purposes Sugiyono [32]. Data processing aims to organize information in a way that can be read and interpreted [31].

3.6. Data Analysis

Regarding data analysis, preliminary assessments such as normality and homogeneity tests were conducted, along with correlation and hypothesis testing techniques like Pearson product-moment analysis, paired sample t-tests, and multivariate analysis of variance (MANOVA) [38]. Employing a mixed-methods approach, primary data were gathered through questionnaires, while secondary data were derived from academic sources. Statistical analyses included Pearson product-moment correlation, t-test, and MANOVA, selected to provide a comprehensive understanding of the relationship between hybrid working and performance outcomes, drawing upon previous research in the field.

4. Results and Discussion

4.1. Results

Conducting validity and reliability testing is the primary requirement for ensuring accurate measurements and progressing with research. Validity testing criteria entail comparing the r-table and the r-count [39]. If the r-table exceeds the r-count, the statement is deemed valid; conversely, if the r-table is lower than the r-count, the statement is considered invalid [30, 40]. After conducting a pilot test of the questionnaire with fifty-two PT. XYZ employees, the results were as follows: 1) Thirty-five statements relating to hybrid working, performance effectiveness, and employee collaboration variables had r-table values lower than the r-count, indicating their validity. 2) One statement from the hybrid working, performance effectiveness, and employee collaboration variables had an r-table value higher than the r-count, suggesting its invalidity. These findings suggest that the statements pertaining to hybrid working, performance effectiveness, and employee collaboration variables are valid and can serve as effective measurement tools. Additionally, the reliability test results from the fifty-two respondents indicated that thirty-six statements from the hybrid working, performance effectiveness, and employee collaboration variables exhibited a Cronbach's Alpha exceeding 0.70. Therefore, it can be concluded that all of these statements can be used as measurement tools [30, 36, 41].

This study analyzed various aspects of respondents' identities, including gender and departmental affiliation. Out of the total 162 respondents, 11.7 percent were male and 88.3 percent were female, reflecting a higher proportion of female employees at PT. XYZ. As a result, the study seeks to investigate gender performance effectiveness in the context of hybrid work. Additionally, respondents were distributed across different departments: 38.3 percent from secretary and HR, 27.8 percent from finance, accounting and tax, 24.7 percent from marketing and operational, and 9.3 percent from IT and legal. This distribution prompts an examination of performance effectiveness in relation to departmental

affiliation in the hybrid working environment.

Normality test in this study used P plot or probability plot. The result of normality test of all variables could be seen in [Figures 2](#) and [3](#), where it could be assumed that variable hybrid working, performance effectivity, and employee's collaboration had normal distribution because the plotting dots were around the diagonal line.

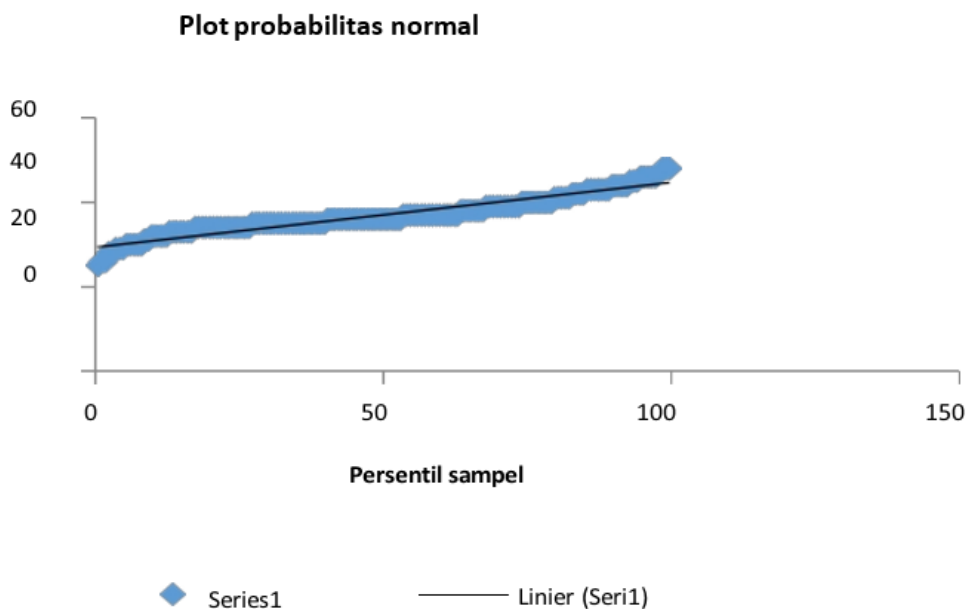


Figure 2.
P-plot normality test result (Hybrid working and performance effectivity).

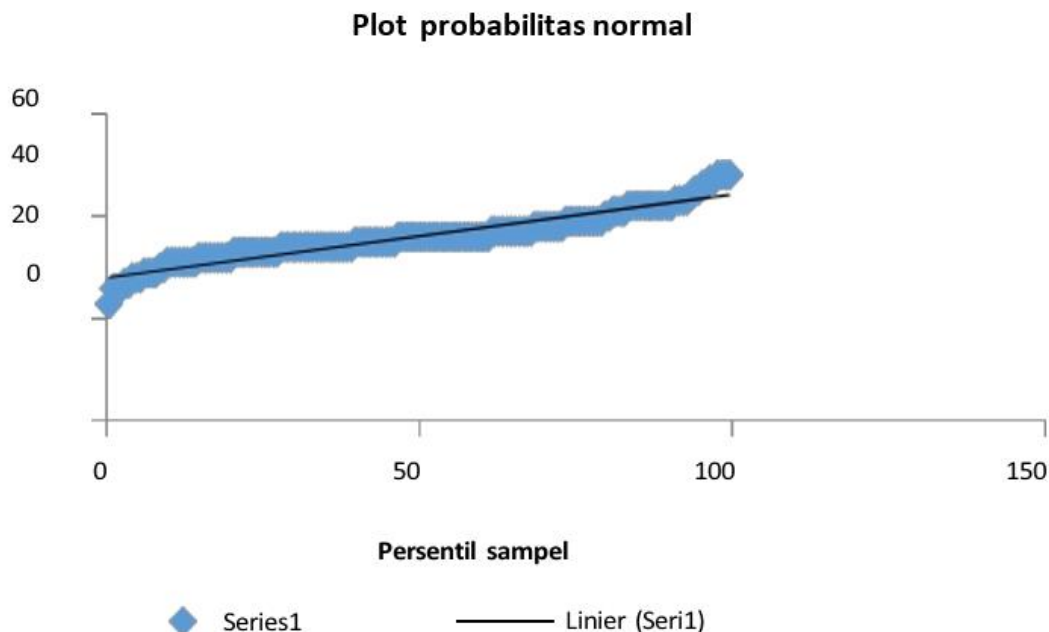


Figure 3.
P-plot normality test result (Hybrid working and employee's collaboration).

The homogeneity test in this study used F-test or Fisher test for testing comparison of hypothesis significance level of two independent samples and also for finding out whether any different treatments of two populations have been tested by determining F-count and F-table firstly [32, 36, 42]. The homogeneity test result in Table 1 showed that variables hybrid working, performance effectivity, and employee's collaboration had homogeneous variants, because the F-count value was smaller than the F-table value.

Table 1.
Homogeneity test result.

Measurement	Hybrid working & performance effectivity	Hybrid working & employee's collaboration
Fcount	0.800	0.724
Ftable	1.299	1.299
Homogeneity	Homogeneous	Homogeneous

This study used the Pearson product-moment correlation method to determine the correlation among the variables of hybrid working, performance effectivity, and employee collaboration. This method, as outlined by Sugiyono [32] necessitates several criteria to be met: random sampling from the population, data for correlation must be on an interval or ratio scale, and both correlation variables must exhibit similar variation.

After conducting calculations using Microsoft Excel in Table 2, the summarized results indicate the following: 1) Variables hybrid working and performance effectivity had strong correlation with a significant value of 0.647. 2) Variables hybrid working and employee's collaboration have medium correlation with a significant value of 0.535.

Table 2.
Pearson product moment correlation result.

Details	Correlation coefficient score (Hybrid working & performance effectivity)
Pearson value	0.647
Correlation level	Strong
Details	Correlation coefficient score (Hybrid working & employee's performance)
Pearson value	0.535
Correlation level	Medium

This study used paired sample t-Test to find out the effect or contribution of independent variable (hybrid working) to dependent variable (performance effectivity and employee's collaboration). The result of paired sample t-Test after processing by data analysis in Microsoft Excel could be seen in Table 3.

Table 3.
Paired sample t-test result.

t-Test: Two-sample assuming equal variances		
Details	Hybrid working	Performance effectivity
Mean	36.563	36.975
Variance	17.153	21.433
Observations	162	162

t-Test: Two-sample assuming equal variances		
Details	Hybrid working	Performance effectivity
Pooledvariance	19.293	-
Hypothesized mean difference	0	-
Df	318	-
tStat	-0.840	-
P(T<=t)two-tail	0.402	-
tCritical two-tail	1.967	-
Details	Hybridworking	Employee'scollaboration
Mean	36.563	36.094
Variance	17.153	23.683
Observations	162	162
Pooled variance	20.418	-
Hypothesized mean difference	0	-
Df	318	-
tStat	0.928	-
P(T<=t)two-tail	0.354	-
Tcriticaltwo-tail	1.967	-

Based on the above result, H_0 accepted it because the value of sig (two-tail) is 0.40, which means variable hybrid working made a significant contribution to performance effectivity. Also, variable hybrid working made a significant contribution to the employee's collaboration because value of sig(*two-tail*) is 0.35.

This study also findout the contribution of gender and department to performance effectivity by paired sample t-Tests through data analysis' calculations in Microsoft Excel. The result is shown in Table 4 and Table 5.

Table 4.
Paired samplet-test result.

Gender	Performance effectivity
Male	4.210
Female	3.522

Based on the above result, it could be concluded that value of sig (two-tail) of male is greater than that of female, which means performance effectivity of male is better than that of female during hybrid working.

Table 5.
Paired samplet-test result.

Department	Performance effectivity
Finance, accounting & tax	4.742
Information technology (IT) & legal	9.979
Marketing & operational	7.034
Secretary & human resources (HR)	3.646

Based on the above result, the value of sig (two-tail) of IT and Legal departments is the highest. So

it could be concluded that performance effectivity of IT and Legal departments were better than another department because IT and Legal department much easier and faster at adapting to the usage of technology and the hardcopy document.

Another analysis that was used in this study is Multivariate Variant (MANOVA). The MANOVA test in this study was processed by Microsoft Excel with data analysis Anova: Two Factor with Replication, which are shown in Table 6 and Table 7. Based on below MANOVA test result, it could be concluded that was Ho accepted because of significance P-Value Interaction are of 0.99.

Table 6.
MANOVA test result (Hybrid working & performance effectivity).

ANOVA						
Source of variation	SS	df	MS	F	P-value	FCrit
Sample	7653342170	2	3826671085	1.762	0.191	3.354
Columns	2792905464	2	1396452732	0.643	0.534	3.354
Interaction	20197471.78	4	5049367.944	0.002	0.999	2.728
Within	58637476281	27	2171758381	-	-	-
Total	69103921387	35	-	-	-	-

Table 7.
MANOVA test result (Hybrid working & employee's collaboration).

ANOVA						
Source of variation	SS	df	MS	F	P-value	FCrit
Sample	7734475028	2	3867237514	1.892	0.170	3.354
Columns	6649528550	2	3324764275	1.626	0.215	3.354
Interaction	30496315.94	4	7624078.986	0.004	0.999	2.728
Within	55196100842	27	2044300031	-	-	-
Total	69610600735	35	-	-	-	-

Note: ANOVA: Analysis of variance; SS: Sum of squares; df: Degrees of freedom; MS: Mean square; F: F-statistic; P-value: Probability value; F Crit: Critical F-value.

4.2. Discussion

Based on the results of Pearson product moment correlation test, t-Test, and multivariate variant analysis (MANOVA), this study found the strong correlation and contribution of hybrid working to performance effectivity. That statement is also supported by the studies of Putri, et al. [8]; Beno [10], and Rositasari and Dudija [7] who revealed that the application of hybrid working was effective and had a high positive value for increasing the job quality, productivity, performance, employee's satisfaction, sustainability and work-life balance compared to cubicle working or traditional working. However, contrary to the studies of Sampepajung and Nurqamar [11]; Mustajab, et al. [15] and Ma'rifah [14] which revealed that WFH, which is applied while hybrid working, had no effect or contribution to job performance or productivity because of the saturation and limitations of supporting facilities while working. Beside that, double role of female employees makes WFH be less profitable because female employee must finalize the office and homework at the same time.

The arguments of the previous study parallel the interview results, which have been done for some of PT. XYZ's employees from some departments who said, "Hybrid working is very useful for the new mom who still could take care of the children while working." (MM). "The application of hybrid working with more of WFH schedule is inappropriate for GA department because most of the tasks need hardcopies, so the team must scan and print back and forth." (RR). "When the internet connectivity did not support it, the employee had difficulty

working because, while doing WFH, employee could not access System Applications and Products (SAP) easily.”(ES).

Based on the above analysis result, previous study, and interview result, the conclusion is that hybrid working could contribute to performance effectivity positively if applied to the suitable department. If hybrid working is applied to an unsuitable department, performance effectivity will decrease. In the [Table 5](#), it is also shown that performance effectivity will be higher if departments can adapt to the usage of technology and hardcopy documents minimally. Related to gender and performance effectivity, [Table 4](#) shows that performance effectivity of male employees is higher than that of female employees because of the perspective of female’s double roles, which is an obstacle when applying hybrid working. Factually, this study found that the application of hybrid working is very profitable for female employees because female employees can still work as an employees also the role of a mother. So that, female employees could have high performance effectivity because of their work-life balance, which includes working and taking care of children.

Based on the Pearson product moment correlation test, t-test, and multivariate variant analysis (MANOVA), this study found the medium correlation and contribution of hybrid working to employee’s collaboration. That statement is also supported by the studies of [Ainurrofiq and Amir \[6\]](#) and [Lenka \[9\]](#) who revealed that hybrid working made communication and collaboration easier and smoother with technology and collaboration tools. Moreover, the sense of employee’s responsibility is higher because of the element of trust created by flexible and efficient regulation. So that, could be created: smooth work implementation, the enhancement of employee’s performance, employee’s motivation, employee’s engagement, and good teamwork. However, contrary to the study of [Toscano and Zappalà \[13\]](#) and [Holtz \[12\]](#) who revealed that while doing remote working during hybrid working, collaboration networks between employees become more static and closed. Also, the communication is limited to a video conference or email. Furthermore, the engagement while hybrid working showed the negative result for employees who live with children under 18 years old during WFH.

The arguments of the previous study are parallel to the interview results that have been given to some of PT. XYZ employees from some departments who said, *“Meeting with the team could be run smoothly although we have different locations because of the collaboration tools, which are provided by the company.”(JF).* *“Online communication could run smoothly if the internet network and applications run smoothly and their is no disruption.”(CT).* *“Full WFO will be better than WFH if there is a problem with coordination and communication, and if you live with children while doing WFH.”(EH).*

Based on the above analysis results, previous studies and interview results, the conclusion is that hybrid working could contribute positively employee’s to collaboration if the tools and infrastructures used and provided by the company could work well and smoothly. If the provided tools and infrastructures during hybrid working are unstable and have problems such as an unstable VPN network, an error wifi network, or an email disruption, certainly employee’s collaboration will be obstructed. However, if the provided tools and infrastructure during hybrid working in stable condition, the entire employee’s collaboration will run smoothly.

5. Conclusions

5.1. Conclusion

We can conclude, based on the predetermined objectives, that hybrid working significantly enhances performance effectiveness, irrespective of gender, and can further improve through department-specific adjustments. Additionally, hybrid working moderately contributes to employee collaboration, particularly when the available facilities and infrastructure are stable and smooth. However, in cases where there are issues with the availability of these resources, employees may find face-to-face collaboration to be more effective.

5.2. Limitations

The study has several limitations: firstly, the male respondents' participation rate was only 11.7%, significantly lower than the female respondents at 88.3%. Secondly, PT. XYZ only conducted the research over a short period, and the respondents only represented seven business units. Thirdly, the study only focused on one independent variable, hybrid working, while there could be other variables influencing employee performance and collaboration at PT. XYZ. Finally, experts have provided limited theory on hybrid working, a relatively new work system phenomenon that companies haven't widely adopted.

5.3. Suggestions

Based on the author's research analyzing hybrid working's impact on performance effectiveness and employee collaboration, several recommendations are made: Firstly, each department should tailor hybrid working to its specific needs. Secondly, companies and governments should establish appropriate regulations regarding hybrid work to ensure employees feel safe and comfortable while working. Thirdly, companies should encourage employees to openly request more office-based work if personal resources, such as unstable internet connections or uncomfortable WFH environments, hinder performance effectiveness. Fourthly, companies should provide tools and infrastructure supportive of hybrid work, such as stable Virtual Private Network (VPN), email servers, and smooth collaboration tools. Future research should strive for equitable participation of both male and female respondents to gain deeper insights into the performance effectiveness of hybrid work. Additionally, we warrant further exploration into how different job types influence performance effectiveness.

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The Ethical Committee of the Perbanas Institute, Indonesia has granted approval for this study (Ref. No. 002/ST.PEL/DP2M/IV/2024).

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

Competing Interests:

The authors declare that they have no competing interests.

Authors' Contributions:

Both authors contributed equally to the conception and design of the study. Both authors have read and agreed to the published version of the manuscript.

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