

The Impact of Hybrid Work Systems on Employee Productivity and Satisfaction in Technology Start-Up Companies: The Role of Employee Autonomy

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Abstract

This study aims to analyze the impact of hybrid work systems on employee productivity and job satisfaction in technology start-up companies, with a focus on employee autonomy as a moderating variable. The hybrid work model which combines remote and in-office work has become increasingly common in the post-pandemic era, particularly within the technology sector. However, its effectiveness in enhancing productivity and job satisfaction remains a topic of debate, especially in the dynamic environment of start-up companies. This research adopts a quantitative approach using surveys administered to employees from various technology start-ups in Indonesia. The study utilizes a quantitative method through survey data collected from employees working in several Indonesian tech start-ups. The data were analyzed using moderation regression to examine both the direct effect of the hybrid work system and the interaction effect with employee autonomy. The findings indicate that while hybrid work positively influences both productivity and job satisfaction, this effect is significantly stronger among employees with high levels of autonomy. The results reveal that hybrid work systems have a positive impact on employee productivity and job satisfaction in technology-based start-up companies in Indonesia. Notably, the influence is more substantial among employees who demonstrate a higher degree of autonomy in their work. This study is subject to certain limitations. Primarily, the data were collected exclusively from technology-based start-up companies in Indonesia, which may limit the generalizability of the findings to other sectors or geographical contexts. This research offers both theoretical and practical contributions to the growing body of literature on hybrid work systems, particularly in the context of tech start-ups. Theoretically, it broadens the understanding of how employee autonomy serves as a moderating variable in the relationship between hybrid work systems and key employee outcomes such as productivity and job satisfaction. The novelty of this study lies in its focus on employee autonomy as a moderating factor, providing fresh insights into how individual traits influence the success of hybrid work arrangements within the fast-paced environment of technology start-ups.

Keywords

Hybrid Work System, Productivity, Job Satisfaction, Employee Autonomy, Technology Start-Up



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1. Introduction

In recent years, dramatic shifts in work models driven by rapid advancements in digital technology and global events such as the COVID-19 pandemic have led many companies, including technology-based start-ups, to adopt hybrid work systems. These systems, which combine remote and on-site working arrangements, have emerged as a strategic response to the growing demand for flexibility, operational efficiency, and sustainability. While the hybrid model offers several potential benefits, including improved work-life balance and reduced operational costs, its effectiveness remains a topic of debate, particularly concerning its impact on employee productivity and job satisfaction. This is especially relevant in start-up environments where work dynamics are fast-paced and continuously evolving. A critical factor influencing the success of hybrid work lies in individual employee characteristics, such as the level of autonomy. In a hybrid work setting, employees are expected to manage their time, responsibilities, and tasks independently without direct supervision. This highlights the importance of examining how the interaction between hybrid work systems and employee autonomy affects work outcomes, particularly within the dynamic landscape of tech start-ups in Indonesia.

Fundamentally, the hybrid work system offers a level of flexibility that can enhance employee well-being while also delivering competitive advantages for organizations. Within start-ups known for their agile, innovation-driven cultures—the hybrid model presents a promising approach to managing modern work demands. However, implementing such a system is not without its challenges. Difficulties arise when organizations lack clear monitoring mechanisms, robust communication structures, or a solid understanding of individual team members' characteristics. As such, a deeper understanding is needed of the factors that influence the success of hybrid work systems in supporting employee productivity and satisfaction.

One such crucial factor is employee autonomy. Autonomy reflects an individual's ability to self-regulate, prioritize tasks, manage time efficiently, and complete assignments without constant managerial oversight. In a setting where daily supervision is minimal, employees with high levels of autonomy are more likely to adapt successfully, maintain consistent work rhythms, and meet performance expectations. In contrast, individuals with low autonomy may experience motivational decline or struggle to complete tasks efficiently.

Given these considerations, this study aims to analyze the impact of hybrid work systems on employee productivity and job satisfaction within Indonesia's tech-based start-up companies, while taking into account employee autonomy as a moderating variable. This research is expected to contribute both theoretically and practically—broadening the academic discourse on modern work dynamics and serving as a practical reference for companies seeking to design hybrid work policies that are more adaptive and aligned with both performance and employee well-being.

Previous studies have explored the impact of hybrid work systems on organizational performance, yet findings remain inconclusive. Some research indicates that hybrid work enhances productivity and job satisfaction due to increased flexibility and reduced commuting stress. Conversely, other studies show that hybrid working can lower productivity when employees lack discipline, access to adequate technological support, or effective team communication. These discrepancies suggest that the success of hybrid work systems is highly contextual and influenced by various mediating or moderating factors.

Febrianty & Muhammad (2023) emphasize that effective human resource management for Generation Z requires a technology-driven, flexible, and adaptive approach. Gen Z values digital learning, real-time feedback, work-life balance, and clear career pathways. Organizations that embrace digital HR practices are better positioned to attract, engage, and retain Gen Z talent ultimately fostering innovation and organizational growth.

In the context of Indonesian tech start-ups characterized by rapid work cycles, evolving organizational structures, and intense pressures for innovation and efficiency there is an increasing need for adaptive work systems that can also sustain employee performance. Thus, understanding internal employee factors such as autonomy becomes essential. This study not only highlights the relationship between hybrid work systems and employee performance but also underlines the importance of considering individual characteristics when designing effective and sustainable work policies.

2. Literature review and hypothesis/es development

2.1.1 Hybrid Work System (Independent Variable / X)

The hybrid work system is a flexible work model that combines working from the office (work from office/WFO) and working remotely from home or other locations (work from home/WFH). This model emerged in response to technological advancements and shifts in work patterns brought about by the COVID-19 pandemic, along with the growing demand for flexibility in the modern workplace. Its primary goal is to strike a balance between operational effectiveness and employee well-being. The hybrid system allows employees to choose the time and place that best suits their work, with the expectation of enhancing both performance and satisfaction (De Smet et al., 2021, in McKinsey & Company). However, implementing a hybrid work system also presents challenges, including the need for digital infrastructure, remote collaboration management, and more complex performance evaluation, (Waizenegger et al., 2020).

2.1.2 Employee Productivity (Dependent Variable / Y1)

Employee productivity refers to the extent to which employees are able to produce work outcomes effectively and efficiently in line with the goals set by the organization. In the context of hybrid work, productivity is a key indicator used to evaluate the success of this system. Productivity can be assessed through several dimensions, such as the quantity of tasks completed, the quality of output, optimal use of working hours, and overall achievement of job objectives. High productivity reflects an employee's ability to remain focused and self-directed, even in the absence of a traditional office environment (Robbins & Judge, 2019).

2.1.3 Employee Job Satisfaction (Dependent Variable / Y2)

Employee job satisfaction is a positive emotional state that arises from an individual's evaluation of their job, including aspects such as the work environment, supervisors, colleagues, and compensation. In a hybrid work setting, job satisfaction becomes a critical component reflecting employees' comfort and psychological well-being. It is typically measured by satisfaction with flexible working conditions, interpersonal relationships within teams, compensation and benefits, and opportunities for career advancement. High levels of job satisfaction are often linked to increased employee loyalty and work motivation (Locke, 1976).

2.1.4 Employee Autonomy (Moderating Variable / Z)

Employee autonomy refers to the degree to which individuals are capable of managing themselves in carrying out tasks without direct supervision. In the hybrid work context, autonomy becomes a crucial factor in ensuring continued productivity despite the lack of face-to-face oversight. It includes the ability to make independent decisions, take initiative in completing tasks, manage time effectively, and maintain personal discipline. A high level of autonomy enables employees to adapt to the challenges of remote work while sustaining optimal performance (Deci & Ryan, 2000).

2.2 Research Framework

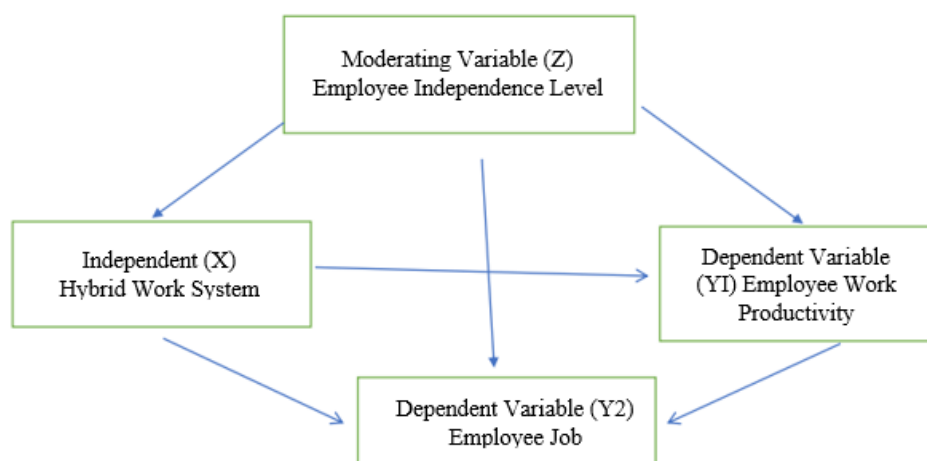


Figure 1. Research Framework

2.3 Research Hypotheses

A hypothesis is a tentative answer to the research problem, proposed based on preliminary assumptions and yet to be supported by empirical data (Sugiyono, 2016).

Research Hypotheses

H1: The hybrid work system has a positive effect on employee productivity.

H2: The hybrid work system has a positive effect on employee job satisfaction.

H3: Employee autonomy moderates the effect of the hybrid work system on employee productivity.

H4: Employee autonomy moderates the effect of the hybrid work system on employee job satisfaction.

3. Methodology

This study adopts a quantitative approach, utilizing a survey method as the primary data collection technique. The respondents in this research are employees from several technology-based start-up companies in Indonesia that have implemented a hybrid work system.

3.1 Operational Definition of Variables

An operational definition refers to a definition expressed in specific criteria used for testing or measurement (Blumberg et al., 2014). The operationalization and measurement of variables in this study are presented in Table 1.

Table 1. Operational Research Variables

Variable	Definition	Indicator	Source
Hybrid Work System	A work model that combines working from home and from the office, with flexible hours and technology support.	1. Frequency of working from home and in the office 2. Time flexibility 3. Technology support	Bloom et al. (2024) Gajendran & Harrison (2007)
Work Productivity	A work model that combines working from home and from the office, with flexible hours and technological support.	1. Task completion efficiency 2. Target achievement 3. Collaboration effectiveness	Gajendran & Harrison (2007)
Job Satisfaction	The level of employee satisfaction with various aspects of the job, including the job itself, superiors, coworkers, and working conditions.	1. Job satisfaction 2. Satisfaction with superiors 3. Satisfaction with coworkers 4. Satisfaction with working conditions	Spector (1997)
Job Satisfaction	An employee's ability to manage time, make decisions, and complete tasks without direct supervision.	1. Time management skills 2. Decision-making skills 3. Task completion skills	Guglielmino (1977)

3.2 Analytical Tools

This research employs a quantitative approach with an explanatory research design. The objective of the study is to examine the impact of the hybrid work system on employee productivity and job satisfaction in technology start-up companies.

1. Population and Sample

The target population of this study consists of employees working in start-up companies, with a specific focus on examining the impact of hybrid work systems on employee productivity and job satisfaction in technology-based start-ups. The inclusion criteria for participants are as follows: Aged between 18 and 25 years, Currently employed at a start-up company. The total number of respondents targeted for this study is 100. Data collection will be conducted online through the distribution of a digital questionnaire using Google Forms

2. Research Instrument

The data collection instrument used in this study is a questionnaire, which was developed based on indicators for each variable. These indicators were adopted and adapted from previous related studies to ensure validity and relevance.

4. Results and discussion

Variable Validity Test

In this study, validity is assessed through construct validity using SEM-PLS software. Construct validity testing in PLS consists of two aspects: **convergent validity** and **discriminant validity**.

Convergent Validity

Convergent validity refers to the degree of correlation among indicators or measures of a given construct. To assess convergent validity in this study, the **Average Variance Extracted (AVE)** is used. AVE measures the extent to which the variance of the indicators reflects the construct they are intended to measure. A higher AVE indicates that the indicators are well correlated with the underlying latent variable. The AVE values for the variables in this study are presented in **Table 2** below:

Table 2. Average Variance Extracted (AVE) Values

Variable	Average Variance Extracted (AVE)
Employee job satisfaction	0.85
Employee productivity	0.78
Hybrid work system	0.83
Employee autonomy	0.789

Source: Research result, 2024

Based on the results of the convergent validity analysis presented in **Table 2**, the **Average Variance Extracted (AVE)** values both the highest and the lowest indicate that all variables in this study demonstrate good convergent validity.

Discriminant Validity

Discriminant validity in a measurement model with reflective indicators is achieved when an indicator's loading on its assigned construct is higher than its loadings on other constructs. This can be identified by comparing the **cross-loadings** of each indicator across constructs. In this study, discriminant validity is assessed through cross-loading analysis, which is presented in **Table 3** below:

Table 3. Cross-Loading Values for Discriminant Validity Assessment

Items	Employee Job Satisfaction	Employee Work Productivity	Hybrid Work System	Employee Independence Level
kkk	0.89			
kkk2	0.95			
kkk3	0.93			
pkk		0.93		
pkk2		0.80		
pkk3		0.92		
skh			0.86	
skh2			0.93	
skh3			0.94	
skh4			0.91	
tkk				0.96
tkk2				0.96

Reliability Test

The accuracy, consistency, and precision of a measuring instrument in carrying out measurement tasks are known as reliability.

Table 4. Cronbach Alpha and Composite Reliability Values

Items	Cronbach's Alpha	Composite Reliability
Employee productivity	0.86	0.92
Hybrid work system	0.93	0.95
Employee job satisfaction	0.91	0.94
Employee independence level	0.91	0.96

Based on **Table 4**, which presents the discriminant validity values measured using cross-loading scores, it is evident that each indicator has a higher loading on its intended construct compared to its loadings on other constructs. This indicates that the discriminant validity of the measurement model is acceptable.

Conclusion on Cronbach's Alpha

All variables show **Cronbach's Alpha values** above the threshold of 0.70, with most values even exceeding 0.80 or 0.90. This indicates that all measurement instruments (questionnaire items) for the respective variables exhibit **very good internal consistency and reliability**.

Conclusion on Composite Reliability

All variables demonstrate **Composite Reliability (CR)** values above the recommended threshold of 0.70, with all scores exceeding 0.90. This confirms that the constructs are measured **consistently and reliably** by their respective indicators.

Respondent Demographic Characteristics

Information regarding the demographic characteristics of the respondents is presented in the table below:

Descriptive Analysis of Respondents

Gender Distribution of Respondents

Table 5. Respondent Characteristics

Gender	Number of Respondents (%)	Description
Male	65,3%	Male respondents are more dominant.
Female	34,7%	Female respondents are fewer.

Table 6. Length of Service at Current Company

Length of work	Percentage (%)	Description
1 Years	23,8%	One of the highest categories on the chart
2 Years	20,8%	Highest work duration
3 Years	10,9%	Quite a lot is visible from the pie chart
4-5 Years	2,0%	Significant group
1,5 Years	2,0%	Small number
2,5 Years	2,0%	Small number
Not working yet	1,0%	Very few
Other (small category)	< 5%	Significant number is visible from the many small pieces

Overall, the demographic characteristics of the respondents show a predominance of male employees and those with relatively short tenure (1–3 years) in their current companies. This distribution is important to consider when interpreting the analysis results, as these demographic traits may have implications for the research variables.

4.1 Data Analysis Results

The analytical tool applied in this study is **Structural Equation Modeling (SEM)** using **SmartPLS version 3.0** software. Partial Least Squares (PLS) is an alternative approach that shifts from the covariance-based SEM method to a variance-based one. While covariance-based SEM is typically used to test causality or theory, PLS is more predictive in nature. Therefore, SEM with PLS enables hypothesis testing without requiring a strongly established theoretical foundation, accommodates several assumptions, and evaluates model fit through the **coefficient of determination (R-squared)** values in the prediction model.

Structural Model Testing (Inner Model)

In this study, there is a very strong correlation between the indicators and their corresponding variables. This finding supports the notion that the indicators effectively represent the observed variables, indicating that the model used is reflective in nature.

R-Squared Value Analysis

The **R-squared (R²)** values in this study can be found in the table below:

Table 7. R-Square Values

Variable	R Square	R Square Adjusted
Employee independence level	0.82	0.81
Employee work productivity	0.85	0.85
Employee job satisfaction	0.87	0.87

Based on the high values of **R-Squared** and **Adjusted R-Squared** (all exceeding 0.80), it can be concluded that the **structural model (inner model)** tested in this study has a **very strong predictive capability**. The independent variables included in the model effectively explain the variance in **employee autonomy, employee productivity, and job satisfaction**.

Hypothesis Testing

Out of the six hypotheses proposed, **four** were found to be statistically significant. These include the paths from the **hybrid work system** to **employee autonomy, employee productivity, and employee job satisfaction**, as well as the path from **job satisfaction** to **employee productivity**. However, the remaining **two hypotheses** specifically, the paths from **employee autonomy** to **productivity** and **job satisfaction** did **not show significant effects**.

Table 8. Direct Effect (Mean, STDEV, T-Statistic)

Variable	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Employee independence level	0.16	0.16	0.11	1.39	0.16
-> employee work productivity	0.37	0.36	0.08	4.66	0.00
Employee independence level -> employee job satisfaction	0.90	0.90	0.02	39.75	0.00
Hybrid work system -> employee independence level	0.38	0.38	0.11	3.47	0.00
Hybrid work system -> employee work productivity	0.58	0.59	0.08	7.16	0.00
Hybrid work system -> employee job satisfaction	0.42	0.40	0.13	3.19	0.00

In summary, this study finds that the **hybrid work system** plays a crucial role in enhancing **employee autonomy**, **productivity**, and **job satisfaction**. Additionally, **job satisfaction** is shown to be a significant driver of **employee productivity**. However, an interesting finding is that while **employee autonomy** is influenced by the hybrid work system, it does **not directly or significantly affect** either productivity or job satisfaction in the tested model. The structural model diagram illustrates the results of the analysis on the impact of the hybrid work system on **employee productivity and job satisfaction** within **technology start-up companies**.

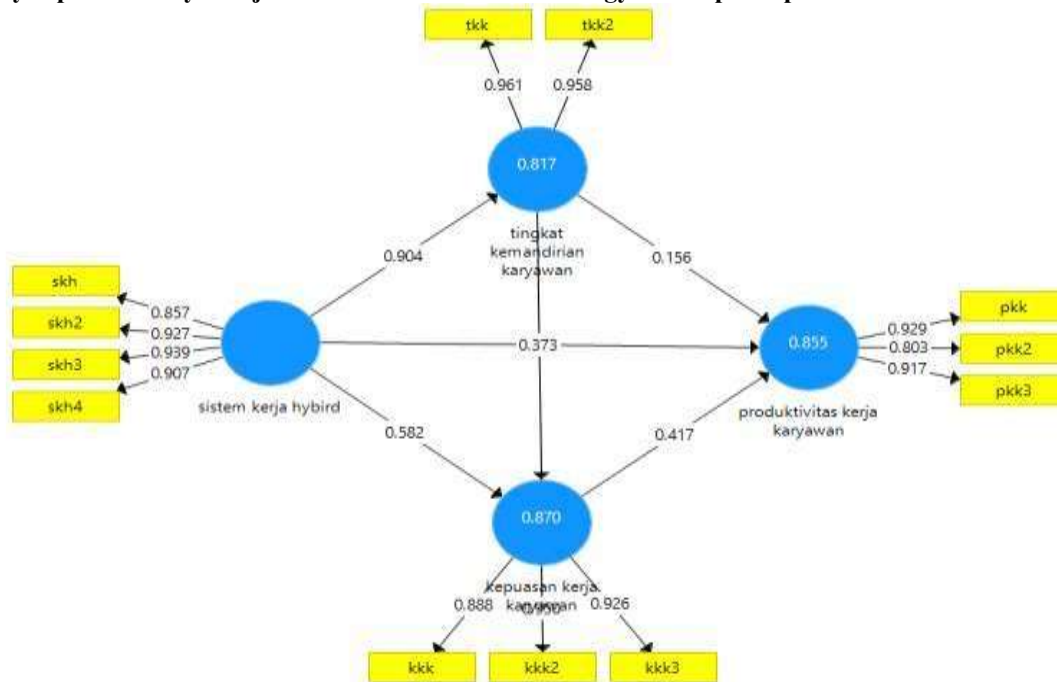


Figure 2. Structural Model

This figure represents a Structural Equation Model (SEM), most likely derived from a Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis, which explores the relationships among variables within the context of technology start-up companies.

Key Components of the Model

1. Latent Variables (Ovals/Circles):

Hybrid Work System (HWS):

This is the main independent variable, measured by four indicators (skh1, skh2, skh3, skh4). The numbers on the arrows linking the variable to its indicators (e.g., 0.857, 0.927) are *loading factors*, indicating how strongly each item reflects the construct. Values above 0.70 suggest strong convergent validity.

Employee Autonomy (EA)

Functions as either a mediating or dependent variable, measured by indicators tk1 and tk2.

Job Satisfaction (JS):

Also a mediating or dependent variable, measured by skk1, skk2, and skk3.

Employee Productivity (EP):

The primary dependent variable, measured by pkk1, pkk2, and pkk3.

2. Path Relationships (Arrows between Latent Variables):

The arrows connecting the constructs represent *standardized path coefficients* (similar to standardized beta coefficients in regression). These coefficients reflect the strength and direction of the direct relationships between the variables.

HWS → EA: 0.904

A very strong positive effect of the hybrid work system on employee autonomy.

HWS → JS: 0.582

A strong positive effect on job satisfaction.

HWS → EP: 0.373

A moderate positive effect on employee productivity.

EA → EP: 0.156

A weak positive effect, suggesting a minimal direct influence.

JS → EP: 0.417

A moderate and significant effect, indicating that job satisfaction is a strong driver of productivity.

Note: Although employee autonomy is influenced by the hybrid system, its direct impact on productivity or satisfaction is minimal or statistically insignificant in this model.

3. R-Square Values (Inside Dependent Variables):

The numbers inside each dependent latent variable represent the *R-square* values, showing the proportion of variance explained by the influencing variables.

Employee Autonomy (0.817):

Approximately 81.7% of the variance in autonomy is explained by the hybrid work system—indicating very high predictive accuracy.

Job Satisfaction (0.870):

Roughly 87.0% of the variance is explained, also reflecting a strong model.

Employee Productivity (0.435):

Around 43.5% of the variance in productivity is accounted for by the hybrid work system, job satisfaction, and (to a lesser extent) autonomy indicating moderate-to-strong predictive power.

Conclusion of the Structural Model Analysis

This structural model highlights the central role of the **hybrid work system** in enhancing employee **autonomy**, **job satisfaction**, and **productivity**. Notably, **job satisfaction** emerges as a significant predictor of **productivity**, reinforcing the idea that satisfied employees are more likely to be productive. Interestingly, while **autonomy** is positively affected by the hybrid system, it does **not have a significant direct influence** on either job satisfaction or productivity in this particular model configuration.

5. Conclusion

5.1. Conclusion

This study examines the impact of hybrid work systems on employee productivity and job satisfaction within technology start-up companies in Indonesia, with employee autonomy serving as a moderating variable. A quantitative approach was employed, using a survey of 100 employees from several Indonesian tech start-ups, the majority of whom were male (65.3%) and had relatively short tenures (1–3 years). Data were analyzed using moderation regression with the SEM-PLS software.

The findings reveal that hybrid work systems have a positive effect on both employee productivity and job satisfaction. This effect is more pronounced among employees with high levels of autonomy. Additionally, job satisfaction was found to be a significant driver of employee productivity.

Although the hybrid work system significantly enhances autonomy, productivity, and job satisfaction, an interesting finding is that employee autonomy, while influenced by the hybrid system, does not directly or significantly affect productivity or job satisfaction in the tested model.

The structural model shows that the hybrid work system is a strong predictor of employee autonomy, job satisfaction, and productivity. The high R-Square values (all above 0.80) for the dependent variables indicate excellent predictive power: approximately 81.7% of the variance in employee autonomy, 87.0% in job satisfaction, and 43.5% in employee productivity are explained by the hybrid work system and job satisfaction.

5.2. Limitation

This study has several limitations. First, the data were collected exclusively from technology-based start-up companies in Indonesia, which limits the generalizability of the findings to other industrial sectors. The novelty of this research lies in its approach, which integrates the hybrid work system with employee autonomy as a moderating variable in the context of technology start-ups in Indonesia.

5.3. Suggestion

This study offers both theoretical and practical contributions to the development of literature on hybrid work systems, particularly in the context of technology-based start-up companies. Theoretically, it broadens the understanding of the role of employee autonomy as a moderating variable influencing the relationship between hybrid work systems and both employee productivity and job satisfaction.

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