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RAISING PERFORMANCE THROUGH INFORMATION TECHNOLOGY AND A GOOD WORK ENVIRONMENT

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ABSTRACT

This study aims to determine how extent the information technology, work environment, and job satisfaction experienced by employees can affect employee performance. This study uses a quantitative method by distributing questionnaires to 215 Yogyakarta employees working at start-up companies, using a purposive sampling technique. The research data were processed using SPSS software version 29.0. The analytical methods used are a t-test, coefficient of determination test, multiple linear regression analysis, and path analysis. The results of this study are that information technology has a positive and significant effect on employee performance, the work environment has a positive but not significant impact on employee performance, and information technology and work environment have a positive and significant effect on job satisfaction. Job satisfaction can mediate the relationship between information technology and the work environment on employee performance.

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1. INTRODUCTION

Startups are information technology-based businesses that offer offline and online services or products [1]. It is also claimed that with the progress of modern times, startups are better known as small businesses with hosting and a domain in the form of a website or blog. The Indonesian Information and Communication Technology Creative Industry Society (MIKTI) has data on 1,190 startups or startups in Indonesia by the end of 2021. As many as 85 startups are located in Yogyakarta [2]. This causes researchers to research with employees working in startups as research objects domiciled in Yogyakarta.

Employees in the company are the company's heart; this makes the company sensitive to employees. Employee performance is an important activity for the company because it will impact how each employee works to achieve company goals. Performance is "the result of work in quality and quantity achieved by an employee in carrying out his duties following the responsibilities given to him" [3]. Employee performance is critical and must be examined at all levels of the organization. The better the performance of personnel, the better the organization's results. Factors influencing employee performance are climate at work, company management, work quality, work competence, initiative, motivation, stability, number of jobs, and discipline at work [4]. Employee performance has several significant benefits for the company [5].

Feelings about the work environment generally influence job satisfaction and reflect employee satisfaction with work-related conditions. Jobs where co-workers and superiors interact, organizational policies are followed, work standards are met, and working conditions are ideal [6]. One of the employees' positive attitudes is job satisfaction, which includes sentiment and behavior toward work. If an employee is satisfied with his job, he will have a good attitude, and vice versa. Indicators for measuring job satisfaction know the actual job, salary, social welfare, possibilities for promotion, monitoring, and co-workers [7]. There are five crucial job satisfaction factors [8]. Job satisfaction is supported by several other factors that can affect the outcome of a job.

Any technology used to process and transfer information electronically is called information technology [9]. Technology in the era of globalization has become a necessity because it can facilitate the work of processing data, storing, and processing data quickly and sophisticatedly. Information technology has an important role [10]. Measuring the value of information technology requires indicators including working rapidly, improving performance, increasing productivity, and being more effective and valuable at work [11]. Technology is needed to improve the performance of each individual; based on previous research has produced data that information technology has a positive and significant impact on employee performance [12], [13], [14]. Noting that job satisfaction is vital for employee self-actualization. Employees dissatisfied with their jobs will never get psychological development and eventually become frustrated. The actions or activities of employees in carrying out their work are positively influenced by information technology, increasing employee performance in almost all parts of the company. Previous research results stated that information technology and job satisfaction positively and significantly influence [14], [16].

One of the things that affect employee happiness is the workplace. Employees become unmotivated to work if the atmosphere around them emits unpleasant vibes. A person's work environment includes all the equipment and materials they use, the environment in which they operate, their work processes, and work arrangements, both individually and collectively [17]. The work environment is divided into two, namely, the physical work environment and the non-physical work environment [18]. Previous research found data showing a positive and significant influence of the work environment on employee performance [19], [21]. Still, it differs from previous research, which produced data that the work environment has an effect but is not significant on employee performance [22]. A good work environment will result in high job satisfaction, reinforced by previous research [23], [26]. The purpose of this research is to find out how far information technology, work environment, and job satisfaction experienced by employees can affect the performance of their employees in the case study of employees working in start-ups domiciled in Yogyakarta.

2. RESEARCH METHOD

This research uses quantitative with 215 respondents, a knowledge discovery method that uses numbers to analyze information about what you want to know [27]. The research takes the case of employees who work at start-ups domiciled in Yogyakarta. Questionnaires are a data collection technique in which respondents are asked to answer a series of questions or written statements [28]. The questionnaire used was in the form of a g-form (Google Form) to answer the respondent's questionnaire, which had been provided by the researcher using a predetermined score using a Likert scale. The weights used in each question are: 1 = Strongly Disagree (STS); 2 = Disagree (TS); 3 = Neutral(N); 4 = Agree(S); 5 = Strongly Agree (SS). The sampling technique used purposive sampling. Purposive sampling is a sampling technique from data sources with certain considerations [29]. The criteria needed are employees who work at Yogyakarta start-ups and those with start-up types of work. Because the size of the population cannot be determined with certainty, the minimum number of samples in this study is determined using the formula 5 x the total number of indicators, with a sample size of 10 x the preferred number of indicators [30].

There are seven hypotheses in this study to confirm the relationship between variables. This study used SPSS software in the early stages of the data collected and then compiled and tested statistically. The validity and reliability of the research instruments were verified at the beginning of the data processing using Corrected item - Total Correlation (validity test) and Cronbach's Alpha (reliability test), assuming a value of > 0.60 was obtained. The standard assumption test uses the data normality test with Kolmogorov-Smirnov (KS). If it passes, the tolerance value is 0.10, and the variance inflation factor (VIF) is 10, which is used to perform the multicollinearity test. There is no multicollinearity between independent variables where appropriate. Finally, a heteroscedasticity test was performed using a scatter plot of random data distribution, without a pattern, and distributed above and below 0 on the X and Y axes so that no data indicates an autocorrelation problem, and this test occurs. The stage coefficient of determination has a value between zero and one. A low R2 value suggests that the ability of the independent variable to explain variations in the dependent variable is minimal. The next stage is linear regression analysis, which assesses the strength of the relationship between variables. At this stage, having multiple linear regression equation models is as follows (job satisfaction). The third stage is to test the hypothesis using the t-test. In the final stage, using path analysis which is an extension of multiple linear regression analysis, uses the Sobel test to estimate the quality of the relationship between the variables that have been determined [31].

3. RESULTS AND ANALYSIS

The researcher conducted a reliability test using the Alpha-Cronbach method, to test the reliability. Based on Table 2. Cronbach's Alpha value of all research variables is more significant than 0.6, indicating that all variables are reliable. As a result, this research instrument deserves further research.

Table 3.1 Validity Test

Variable	Statement	rcount	rtable	Information
Technology Information	T1	0,437	0,1338	Valid
	T2	0,289	0,1338	Valid
	T3	0,356	0,1338	Valid
	T4	0,392	0,1338	Valid
	T5	0,347	0,1338	Valid
	T6	0,382	0,1338	Valid
	T7	0,374	0,1338	Valid
	T8	0,358	0,1338	Valid
	T9	0,444	0,1338	Valid
	T10	0,373	0,1338	Valid
Work Environment	WE1	0,396	0,1338	Valid
	WE2	0,344	0,1338	Valid
	WE3	0,384	0,1338	Valid
	WE4	0,390	0,1338	Valid
	WE5	0,357	0,1338	Valid
	WE6	0,305	0,1338	Valid
Employee Performance	EP1	0,390	0,1338	Valid
	EP2	0,315	0,1338	Valid
	EP3	0,320	0,1338	Valid
	EP4	0,381	0,1338	Valid
	EP5	0,453	0,1338	Valid
	EP6	0,322	0,1338	Valid
	EP7	0,342	0,1338	Valid
	EP8	0,399	0,1338	Valid
	EP9	0,289	0,1338	Valid
	EP10	0,196	0,1338	Valid
	EP11	0,352	0,1338	Valid
	EP12	0,28	0,1338	Valid
Job Satisfaction	JS 1	0,505	0,1338	Valid
	JS 2	0,311	0,1338	Valid
	JS 3	0,419	0,1338	Valid
	JS 4	0,435	0,1338	Valid
	JS 5	0,385	0,1338	Valid
	JS 6	0,443	0,1338	Valid
	JS 7	0,402	0,1338	Valid
	JS 8	0,422	0,1338	Valid
	JS 9	0,424	0,1338	Valid
	JS 10	0,499	0,1338	Valid
	JS 11	0,557	0,1338	Valid
	JS 12	0,457	0,1338	Valid
	JS 13	0,486	0,1338	Valid
	JS 14	0,458	0,1338	Valid
	JS 15	0,479	0,1338	Valid

Based on Table 2. Cronbach's Alpha value of all research variables is more significant than 0.6, which indicates that all variables are reliable. As a result, this research instrument deserves further research.

Table 2. Reliability Test

Number	Statement	Cronbach's Alpha value	Sig	Information
1	Technology Information (X1)	0,716	>0,6	Reliable
2	Work Environment (X2)	0,628	>0,6	Reliable
3	Employee Performance (Y)	0,697	>0,6	Reliable

4	Job Satisfaction (Z)	0,827	>0,6	Reliable

Table 3. has data on the characteristics of research respondents out of 215 respondents taken using a questionnaire; the most dominant data of the eight factors is that the Yogyakarta domicile has 215 people, 125 female genders, 115 people aged 28-42 years, the type of start-up trade 101 people for goods or services (e-commerce), 110 people with the last bachelor degree, 110 people with 1-5 years of experience, 145 employees with permanent employee status (PKWT), and the average income earned by employees start-ups in Yogyakarta as much as IDR 2,000,000-IDR 5,000,000 for 148 people.

Table 3. Respondent Characteristics

Characteristics	The Dominant Characteristics	Frequency	Percentage
Domicile	Yogyakarta	215	100
Gender	Woman	125	58,1
Age	28-42 years	115	53,5
Types of *start-ups*	Trade in goods or services (e-commerce)	101	47
Recent Education	S1	110	51,2
Length of Work	1-5 years	110	51,2
Employee Status	Permanent Employees (PKWT)	145	67,4
Average Earnings	IDR 2.000.000- IDR 5.000.000	148	68,8

Source: Processed primary data, 2023

The normality test based on the results of the One-Sample Kolmogorov-Smirnov Test in Table 4. obtains a significance value of 0.200d > 0.05, so all variables in this study are normally distributed.

Table 4. Normality Test

One-Sample Kolmogorov-Smirnov Test			
			Unstandardized Residual
N			215
Normal Parameters[a,b]	Mean		.0000000
	Std. Deviation		391.534.265
Most Extreme Differences	Absolute		.047
	Positive		.047
	Negative		-.039
Test Statistic			.047
Asymp. Sig. (2-tailed)[c]			.200[d]
Monte Carlo Sig. (2-tailed)[e]	Sig.		.301
	99% Confidence Interval	Lower Bound	.289
		Upper Bound	.313

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.
e. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 2000000.

The heteroscedasticity test uses a scatter plot as a heteroscedasticity test, as shown in Figure 1. which can be concluded in Figure 3.1 that the data distribution is random, without a pattern, and distributed above and below 0 on the X and Y axes. Hence, no data indicates an autocorrelation problem, so there is no heteroscedasticity, and this test is fulfilled.

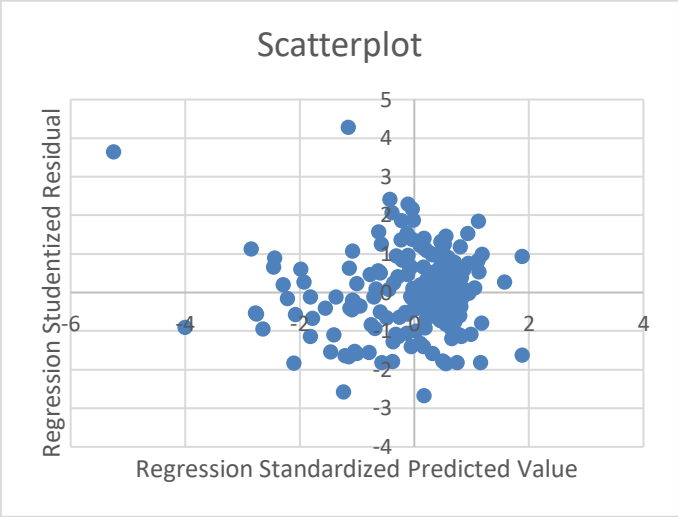

Figure 1. Heteroscedasticity with the scatter plot

To test multicollinearity by looking at the Variance Inflation Factor (VIF) value and the tolerance value, multicollinearity in regression can be checked to see any problems. It can be concluded that multicollinearity does not occur if the tolerance value is more than 0.1 or the VIF value is less than 10. Table 5. shows that multicollinearity does not happen because the tolerance value (VIF) is more than 0.1.

Table 5. Multicollinearity Test

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	9.614	2.351		4.089	<.001		
	TI (X1)	.300	.085	.243	3.513	<.001	.419	2.384
	WE (X2)	.182	.099	.113	1.829	.069	.523	1.913
	JS (Z)	.351	.055	.476	6.329	<.001	.354	2.822

a. Dependent Variable: Y

Table 6. shows that the coefficient of determination (R2) shows 57.8%, which can be interpreted that the variables of information technology (X1), work environment (X2), and job satisfaction (Z) have a contributing influence of 57.8% on the performance of the remaining employees 42 .2% is influenced by factors other than variables X1, X2 and Z.

Table 6. The results of the Coefficient of Determination of Model Equation 1

Model Summary				
Model	R	R Square	Adjusted R Square	Std. An error in the Estimate
1	.760[a]	.578	.572	3.943

a. Predictors: (Constant), Job Satisfaction (Z), Work Environment (X2), Information Technology (X1)

Table 7. shows that the coefficient of determination (R2) shows 64.6%, which can be interpreted that the variables of information technology (X1), and work environment (X2) have an influence that contributes 64.6% to job satisfaction, the remaining 35.4.2% are influenced by factors other than variables X1, and X2.

Table 7. The Coefficient of Determination of Model Equation 2

Model Summary				
Model	R	R Square	Adjusted R Square	Std. An error in the Estimate

1	.804[a]	.646	.642	4.890

a. Predictors: (Constant), Work Environment (X2), Information Technology (X1)

Table 8. Results from multiple regression analysis on the dependent variable of employee performance. Table 3.8 has a multiple linear regression equation that: (1) if all independent variables have a value of zero (0), then the dependent variable (employee performance) has a value of 9,614, (2) The coefficient of the information technology variable X1 is 0.300, meaning that as long as the variable other independent variables in the regression model remain constant, so any increase in the information technology variable (X1) will increase the employee performance variable, (3) The coefficient of the work environment variable X2 is 0.182, meaning that as long as the other independent variables in the regression model remain constant, then any increase in the unstable work environment (X2) will increase employee performance variables, (4) The coefficient of work satisfaction variable Z is 0.351, meaning that as long as the other independent variables in the regression model remain constant, then any increase in job satisfaction variable (Z) will increase employee performance variables.

Table 8. Result of Model 1

Coefficients[a]

Model		Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	9.614	2.351		4.089	<.001
	Information Technology (X1)	.300	.085	.243	3.513	<.000
	Work environment (X2)	.182	.099	.113	1.829	.068
	Job satisfaction (Z)	.351	.055	.476	6.329	<.000

a. Dependent Variable: Employee performance (Y)

Based on Table 9. it is known that it has the following equations: (1) If all independent variables have a value of zero (0), then the dependent variable (employee performance) has a value of 5,251, (2) The coefficient of information technology value variable X1 is 0.907, meaning that as long as other independent variables in the regression model remain constant, so any increase in the information technology variable (X1) will increase the job satisfaction variable. (3) The coefficient value of the work environment variable X2 is 0.771. As long as the other independent variables in the regression model remain constant, any increase in the work environment variable (X2) will increase the job satisfaction variable.

Table 9. Result of Model 2

Coefficients[a]

Model		Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	5.251	2.894		1.815	.071
	Information Technology (X1)	.907	.086	.540	10.578	<.001
	Work environment (X2)	.771	.111	.353	6.922	<.001

a. Dependent Variable: Employee performance (Z)

The t-test can be seen in Table 8. and Table 9. Based on the data that can be seen in Tables 8 and 9. the results of the hypothesis can be described in (1) the effect of information technology on employee performance with a significant figure in hypothesis testing is 0.001 <0.05, so that "There is a significant effect of information technology variables on satisfaction work" can be said to be proven. (2) the effect of the work environment on employee performance with a significant number in testing the hypothesis is 0.069 > 0.05, so "There is a significant effect of work environment variables on employee performance" can be said to be unproven. (3) the effect of information technology on job satisfaction with a significant number in

testing the hypothesis is 0.001 <0.05, so that "There is a significant influence of information technology variables on job satisfaction" can be said to be proven. (5) the influence of the work environment on job satisfaction with a significant number in testing the hypothesis is 0.001 <0.05, so that "There is a significant effect of work environment variables on job satisfaction" can be said to be proven.

Path analysis uses the Sobel test to test the mediation hypothesis. The Sobel test measures the strength of the indirect influence from X to Y through Z. The Sobel test measures the power of the indirect impact from X to Y through Z. The indirect power from X to Y through Z is calculated by multiplying the path X -> Z(a) by the way Z - > Y (b) or ab. If the resulting Z value is greater or less than 1.96, then the indirect variable is said to have a more significant influence than the direct variable [33]. Path analysis can be done with the Sobel test formula:

$S_{ab}= \sqrt{b^2Sa^2+a^2Sb^2 + Sa^2Sb^2}$

$S_{ab}= \sqrt{0{,}351^2 0{,}086^2+0{,}907^2 0{,}055^2 + 0{,}086^2 0{,}055^2}$

$S_{ab}=\sqrt{(0{,}123201x0{,}007396) + (0{,}822649x0{,}003025) + (0{,}007396x0{,}003025)}$

$S_{ab}= 0{,}058499$

Then here, the calculation for Z value:

$Z = \frac{ab}{S_{ab}}$

$Z = \frac{0{,}318357}{0{,}058499}= 5{,}4421346$

This study obtained Z value of 5.4421 > 1.96. This finding indicates that the indirect effect of information technology on employee performance through job satisfaction is greater than the direct effect of information technology on employee performance.

$S_{ab}= \sqrt{b^2Sa^2+a^2Sb^2 + Sa^2Sb^2}$

$S_{ab}= \sqrt{0{,}351^2 0{,}111^2+0{,}771^2 0{,}055^2 + 0{,}111^2 0{,}055^2}$

$S_{ab}=\sqrt{(0{,}1232x0{,}01232) + (0{,}59444x0{,}00303) + (0{,}01232x0{,}00303}$

$S_{ab}= 0{,}05791$

Then here, the calculation for Z value:

$Z = \frac{ab}{S_{ab}}$

$Z = \frac{0{,}27062}{0{,}05791}= 4{,}67324$

The seventh hypothesis uses path analysis to determine which mediating variables can have an indirect effect using the Sobel test. Because the Z value is 4.67324 > 1.96, this finding indicates that the indirect effect of the work environment on employee performance through job satisfaction is greater than the direct effect of information technology on employee performance.

3.1. Effect of Information Technology, work environment, and job satisfaction on Employee Performance

A significance value of 0.001 is obtained as a result of the calculation. Research significance level > 0.05, then H0 is accepted, Ha is rejected, and vice versa. This study indicates that information technology will raise employee performance at Yogyakarta start-ups. This research is supported by previous research, which resulted in that information technology has a positive and significant effect on employee performance [12], [14]. While a significance value of 0.069 is obtained as a result of the calculation. Research significance level > 0.05, then H0 is accepted, Ha is rejected, and vice versa. The results obtained from this study can prove that the work environment has a positive relationship with employee performance, but it is not significant. But the work environment does not significantly impact Yogyakarta start-up employees' performance. Previous research supports that producing a work environment does not substantially affect employee performance; work environment factors include facilities and infrastructure and interpersonal relationships with colleagues, superiors, and subordinates [22]. This study differs from previous studies, which concluded that the work environment significantly affects employee performance [19], [21]. A significance value of 0.001 is obtained as a result of the calculation. Research significance level > 0.05, then H0 is accepted, Ha is rejected, and vice versa. This research shows that job satisfaction potentially raises the performance of start-up employees in Yogyakarta. The results of this study are strengthened by previous research that has been conducted, which resulted in research that job satisfaction can have a positive and significant effect on employee performance [34], [37]. Good employee performance will result in both the organization and the affected personnel feeling satisfied in their jobs, making it easier to achieve the goals set.

3.2. Effect of Information Technology and work environment on Job Satisfaction

A significance value of 0.001 is obtained as a result of the calculation. It indicates that information technology encourages Yogyakarta start-up job satisfaction. This research is supported by previous studies that produced data on a significant positive impact of information technology on job satisfaction [14], [16]. While a significance value of 0.001 is obtained as a result of the calculation. For a while, the work environment can affect Yogyakarta start-up job satisfaction. Previous research explains that the work environment can positively and significantly affect job satisfaction [23], [26]. It can be concluded that the work environment substantially impacts the creation and maintenance of employee job satisfaction. Satisfied employees will be more loyal to the organization, enabling them to properly carry out their duties and responsibilities. Job satisfaction arises as a result of the current organizational work situation.

3.3. The Influence of Information Technology and work environment on Employee Performance Through Job Satisfaction

The magnitude of the Z value is 5.4421 > 1.96 based on the results of the Sobel analysis test. Because the Z value is 5.4421 > 1.96, these findings indicate that the indirect effect of information technology on employee performance through job satisfaction is more significant than the direct influence of information technology on employee performance. Previous studies support this study where job satisfaction can moderate the effect of information technology on employee performance either directly or indirectly [12], [14], [38].

The magnitude of the Z value is 4.67324 > 1.96 based on the results of the Sobel analysis test. Because the Z value is 4.67324 > 1.96, this finding indicates that the value of the indirect effect of the work environment on employee performance through job satisfaction is greater than the direct effect of information technology on employee performance. This study is strengthened by previous studies, which produced work environment data on employee performance which is mediated by job satisfaction and has a significant positive effect [39], [42].

4. CONCLUSION

Based on the analysis that has been done, it can be concluded that: a). Information technology has a positive and significant impact on employee performance. b). The work environment has a positive but insignificant effect on employee performance. c). Information technology and work environment positively and significantly affect job satisfaction. d). Job satisfaction on employee performance has a positive and significant influence. e). Information technology and work environment on employee performance through job satisfaction can mediate positively and significantly.

Technology is developing rapidly, and startup companies can predict that future technologies will continue to be more sophisticated, so startup companies must conduct adequate training for employees on information technology following the positions they are responsible for to maintain employee quality. The startup work environment is dynamic and unpredictable. To create a comfortable and enjoyable work environment, make it a healthy and positive workplace-support team members' mental and physical well-being creating a healthy and positive work environment. Employees get assignments according to their field of work to improve employee performance in completing them according to their abilities and produce more efficient and effective time. In the future, startup companies can pay more attention to their employees by paying attention to various factors such as job demands based on position, work facilities, benefits that employees receive from their jobs, and others. For further research, we expect that the scope of the research sample will be broader, with research samples taken from all provinces in Indonesia.

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