

The Effect of The Effectiveness of The Implementation of Fingerprint Attendance on Work Discipline at PT. Terang Cahaya Abadi Sejati

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INDEXING	ABSTRACT
<p>Keywords: Keyword 1; Fingerprint attendance Keyword 2; Work discipline Keyword 3; Questionnaire</p>	<p>The development of science and information technology in the current era of globalization is seen to be increasing very rapidly, so that systems that were once manual are now electronic such as human resource management in terms of taking attendance/attendance of employees at PT. Terang Cahaya Abadi Sejati which uses an electronic attendance system (fingerprint). This study aims to determine the effect of the effectiveness of the implementation of fingerprint attendance in improving employee work discipline. This study uses quantitative research through data collection using questionnaires. The number of samples used was 30 people who were employees at PT. Terang Cahaya Abadi Sejati. The results of this study show that the application of fingerprint attendance has a positive and significant influence on the work discipline of employees of PT. Terang Cahaya Abadi Sejati. This is evidenced by the result of a regression coefficient of positive This is evidenced by the variable X1 (Practical) having a Sig. of $0.000 < 0.05$ and a calculated t-value of $3.941 > 2.05183$. The obstacles that occurred at PT. Terang Cahaya Abadi Sejati is caused by employees experiencing urgent personal situations, feeling that they are not closely supervised, and lacking a sense of responsibility or commitment to work. The solution that can be given to the Company is to check attendance regularly, ensuring that all employees understand the importance of notifying their absences in the right way. Using an attendance system or time tracker that monitors employee attendance and whereabouts during working hours.</p>

Article History

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INTRODUCTION

The rapidly growing digital era is accompanied by an increase in the application of technology in a number of aspects of human life. Ganbold *et al* (2021) stated that the essential contribution of information technology can be seen in the efficient management, collection, and access of data. However, challenges can arise if adequate human resources do not contribute to the company which can hinder the achievement of the mission effectively and efficiently (Pynes, 2008). Challenges in the form of system failures, neglect to adapt to change, and inefficient spending are often faced. Without the contribution of competent human resources, advanced technology can become an additional burden, hindering productivity and improvisation instead of supporting increased efficiency and innovation, as well as described by Nair (2016), Dwivedi and Joshi (2019), Mubarak *et al* (2021), and also Sharma and Meet (2023).

The achievement of a company's mission is highly dependent on the work discipline of employees. Work discipline contributes as a primary medium that managers apply in connecting with employees, motivating behavior change, and improvising their awareness and commitment to fulfilling every company policy (Abdelwahed and Daghan, 2023). The application of good work discipline will have an impact on employee motivation for interpretation and recognition of the importance of following policies and contributing to the achievement of the company's overall mission (Maryani *et al*, 2021).

Improving employee work discipline is achieved through the application of fingerprint-based attendance machines. Adal *et al* (2018), Mir *et al* (2018), and Rahkoyo *et al* (2024) concluded that fingerprint technology is applied by this machine by accurately verifying employee attendance. To make it easier to fill in attendance for employees who have arrived at work, this machine is usually installed in front of the office door. The effectiveness of the fingerprint attendance system is evaluated against the determination of the capacity to fulfill this technology to achieve the company's goals and expectations. Improving the accuracy and efficiency of attendance recording requires in-depth analysis. The impact of the system on attendance management and work discipline is thoroughly evaluated. Technical, operational, and constraint constraints from the user's perspective are identified and overcome. The important insights obtained from the evaluation results support better strategic decision consideration for attendance management and improvement of work discipline.

PT. Terang Cahaya Abadi Sejati (TCAS) is one of the companies engaged in the field of nonwoven manufacturers that has been operating for the longest time in Indonesia, including the production of nonwoven carpets, rugs, and shoelaces. The company was established in 1989, providing machines with the most advanced technology for needle punch, stitch bonding, carding and air-laid, superior engineering and service capabilities from a modern factory on Mekar Raya Street Kav—37 Gedebage, and having more than 30 years of experience, PT. TCAS has been known as a world-class nonwoven manufacturer. PT TCAS has 130 employees, and as PT TCAS develops, it is important to perform well for all employees. Good performance can be measured by the level of employee discipline. The level of employee work discipline can be measured from the level of employee attendance, the following is a list of employee tables at PT Terang Cahaya Abadi for the period of January 2023 – December 2023.

**Table 1. Employee Attendance List at PT. Terang Cahaya Abadi Sejati
January 2023 – December 2023**

No	Month	Number of employees	Late	%
1	January	130	7	9,1
2	February	130	5	6,5
3	March	130	4	5,2
4	April	130	5	6,5
5	May	130	9	11,7
6	June	130	7	9,1
7	July	130	5	6,5
8	August	130	8	10,4
9	September	130	7	9,1
10	October	130	9	11,7
11	November	130	5	6,5
12	December	130	2	2,6

Source : Researcher (2024)

In the table above, it can be seen that the attendance value of PT Terang Cahaya Abadi Sejato employees from January 2023 to December 2023 is not 100% full. Based on the results of the pre-survey conducted by the researcher, there are still employees who lack discipline in working such as those who do not come on time when entering work, postpone tasks that should be done on time, cannot use facilities effectively and efficiently and there are still some employees who leave their duties during working hours without valid information. This can be seen in the data table 1, from the table it can be seen that there are still some employees who arrive late or do not leave on time. Henceforth, the author is interested in researching the problem of "The Effect of the Effectiveness of the Implementation of Fingerprint Attendance on Employee Work Discipline at PT. Terang Cahaya Abadi."

LITERATURE REVIEW

According to Syafitri (2018) explains that the meaning of effectiveness and efficiency. Effectiveness is intended as the level of how far a social system achieves its goals. Effectiveness must be distinguished by efficiency. Efficiency implies a comparison between costs and outcomes, while effectiveness is directly linked to the achievement of a goal". Meanwhile, according to Akhmetova *et al* (2019), the concept of organizational effectiveness is based on system theory and time dimension. Based on the system theory that the effectiveness of the organization must be able to describe the entire cycle of inputs, processes, and process outputs must also be able to describe the harmonious mutual relationship between the organization and the wider environment. Meanwhile, based on the time dimension, an organization is defined as an element of a larger system (environment) by going through various processes in taking resources, continuing to process them, and finally becoming a finished product that will be returned to its environment.

According to Onyango (2015), effectiveness indicator variables have 5 sub-indicators, namely *Program Understanding, Right on target, on time, achievement of goals, Real changes*. Decaprio *et al* (2023) described the attendance is an overview of the participation of workers / students / instructors which contains a long time span of appearance and flight time as well as reasons or data for participation. This participation is related to the utilization that is still not optimal by each organization or institution. Uniquemark is the origin of the English word meaning finger impression. Fingerprints are lines on the skin of the fingertips. Fingerprints effectively provide a more important grid so that the fingers can withstand protests more strongly.

The fingerprint attendance system is an attendance detection system that uses fingerprints. Here are some of the variables why choosing participation using a fingerprint attendance machine is an ideal decision with different benefits. (Decaprio *et al.*, 2023). The finger strokes of each individual are unique, no similarities have been found, No reports, Accommodation, Starting from direct registration, workers do not need to try to bring cards or paper or representative cards. Every representative will not neglect to bring an entry gadget or enlisted fingers, Security By utilizing fingerprint participation, the participation rate becomes very high because each fingerprint of each client is unique or extraordinary. So, clients cannot take advantage of each other's special participation, or use cards, Stay away from misuse of participation records.

Discipline is a management action to encourage the members of the organization to meet the demands of these various provisions. Employee discipline is a form of training that seeks to improve and shape the knowledge, attitudes and behaviors of the employee voluntarily trying to work cooperatively with other employees and improve their work performance. (Ariffudin *et al*, 2023). The dimension is obedient to time rules: clock-in, break-time, and clock-out. The dimensions of obedience to company regulations: how to dress, good manners and work compliance. Dimensions of the rules of behavior at work: behavior, responsibilities and suitability of the job to abilities (Widarko and Anwarodin, 2022).

RESEARCH METHOD

In this study, the approach taken is a quantitative approach. According to Kamaruddin *et al* (2023), the quantitative method is a research method based on the philosophy of positivism, used to research a certain population or sample, data collection using research instruments, statistical quantitative data analysis, with the aim of testing the hypothesis that has been determined".

Furthermore, Sullivan-Bolyai and Bova (2014) stated that quantitative data analysis is carried out after the data is collected using descriptive or inferential statistical calculations, so that a conclusion is obtained whether or not the hypothesis that has been formulated previously is proven or not.

Independent variables or also called independent variables are variables that can influence dependent variables or bound variables. The independent variable used in this study is Fingerprint Attendance or the X variable (Surajiyo *et al*, 2021).

Dependent Variable or Dependent Variable (Bound Variable) is a variable whose value depends on the presence of other variables. This dependent variable is also called the response variable which is symbolized by the symbol Y. The dependent variable or Y variable in this study is Work Discipline (Purnomo *et al*, 2020).

Gaur *et al* (2020) implemented data collection using questionnaires, the incoming data will be processed and then data measurement is carried out with weighting. To analyze the data, the authors used questionnaires distributed to respondents as research material. In this case, the questionnaire data uses the Likert Scale. The Likert Scale is a scale that can be used to measure a person's attitudes, opinions, and perceptions about a particular object or phenomenon. Thus, the data obtained from the respondents is qualitative data, then for the purposes of quantitative analysis, the score modified into the table below is determined:

Table 2. Research Scale (Likert Scale)

Options	Initials	Shoes
Strongly agree	SS	5
Agree	S	4
Neutral	N	3
Disagree	TS	2
Strongly disagree	STS	1

Source : Researcher (2024)

According to Nardi (2018), survey methods are used to obtain data from certain places that are natural (not artificial), but researchers carry out treatment in data collection, for example by distributing questionnaires, tests, structured interviews and etc.

In this study, the researcher used a questionnaire conducted online using a google form distributed to workers at PT. Terang Cahaya Abadi Sejati. The population in this study is factory employees of PT. Terang Cahaya Abadi Sejati in the field (engine) as many as 30 people. So that the sample used in this study is using a saturated sample, meaning that all employees in the field of 30 people are respondents in this study.

According to Hennink *et al* (2019), saturated Sampling is a sample selection technique when all members of the population are sampled. The sampling technique in this study uses the Saturated Sampling Technique, where all populations in this study are used as samples.

Data collection was carried out through interviews and observations. The interviewer conducted a question and answer directly with the resource person to obtain relevant information. In addition, the review was carried out directly in the field in identifying a number of aspects related to the research object (Moser and Korstjens, 2018).

A questionnaire (questionnaire) is a list of questions/written statements given in order to get respondents' responses to a study related to "The Effect of the Effectiveness of the Implementation of Fingerprint Attendance on Employee Work Discipline at PT. Terang Cahaya Abadi Sejati."

The validity test aims to see the validity or suitability of the questionnaire used by the researcher in measuring and obtaining research data from respondents.

This test is used to see the influence of free variables on bound variables. Sugiyono (2017:261) explained that the general equation of simple linear regression is.

$$Y' = a + bX_1 + cX_2 + \epsilon$$

The T-Test tests each regression coefficient separately, this test is used to look at the significance of the individual roles between the independent variable in the bound variable assuming that the other independent variable is said to be constant. The requirements for the T test are:

Count > Ttable a then: $H_a : \beta \neq 0$: found a significant influence

Calculate < Ttable then: $H_o : \beta = 0$: no significant influence found

The T-Test tests each regression coefficient simultaneously. This test is used to see the influence of each independent variable in the model simultaneously on the bound variable. The test requirements are:

$F_{cal} > F_{table}$ a then: $H_a : \beta \neq 0$: found a significant influence

Calculate < Ttable then : $H_o : \beta = 0$: no significant influence found

RESULT AND DISCUSSION

Table 3. Validity Test

Variable	Indicator	R table	r calculate	Information
Practical (X1)	X1.1	R>0,361	0,541	Valid
	X1.2	R>0,361	0,526	Valid
	X1.3	R>0,361	0,536	Valid
Accurate (X2)	X2.1	R>0,361	0,546	Valid
	X2.2	R>0,361	0,547	Valid

	X2.3	R>0,361	0,531	Valid
On Time (X3)	X3.1	R>0,361	0,534	Valid
	X3.2	R>0,361	0,544	Valid
	X3.3	R>0,361	0,542	Valid
	Y1.1	R>0,361	0,529	Valid
Work Discipline (Y)	Y1.2	R>0,361	0,523	Valid
	Y1.3	R>0,361	0,540	Valid

Source : Researcher (2024)

Based on the table, it can be seen that all statements about Practical (X1), Accurate (X2), On time (X3) and Work Discipline (Y) have a value of r calculation > r table 0.361, so that all statements are said to be valid.

Table 4. Simple Linear Regression Test

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.505	.656		2.295	.030
	Accurate	-.082	.032	-.086	-2.572	.016
	On Time	-.017	.025	-.023	-.670	.509
	Practical	.978	.033	.977	29.698	.000

Source : Researcher (2024)

From the table above, a simple linear regression equation is obtained as follows:
 $Y = 1,505 - 0,082X1 - 0,017X2 + 0,978X3$

Along with the equation mentioned above, it can be described as follows:

1. The value of the constant (a) in this research is 1.505, which means that if the variables Accurate (X1), On Time (X2), and Practical (X3) are considered non-existent or constant at zero (0), then the Work Discipline (Y) is worth 1.505.
2. The Accurate regression coefficient with a negative value of 0.082 states that for every increase in one unit of Accurate (X1), it is estimated that Work Discipline (Y) will decrease by 0.082 assuming that other variables have a fixed value.
3. The On Time regression coefficient with a negative value of 0.017 states that for every increase in one unit of On Time (X2), it is estimated that Work Discipline (Y) will decrease by 0.017 assuming other variables have a fixed value.
4. The Practical regression coefficient with a positive value of 0.978 states that for every increase of one Practical unit (X3), it is estimated that Work Discipline (Y) will increase by 0.978 assuming that other variables have a fixed value.

Table 5. Hypothesis Test (T-Test)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.061	2.907		.365	.718
	Absensi Fingerprint	.319	.081	.597	3.941	.000

Source : Researcher (2024)

Based on the table above, it can be known that the Sig. value is $0.000 < 0.05$ and the calculated t value is $3.941 > 2.05183$ so that it can be concluded that H_{a1} is accepted, namely the variable X (Fingerprint Attendance) affects the variable Y (Work Discipline).

Table 6. Hypothesis Test (Test F)

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.525	1	10.525	15.531	.000 ^b
	Residual	18.975	28	.678		
	Total	29.500	29			

Source : Researcher (2024)

The results of the statistical calculation in table 5 show that the F value is calculated = 15.531 with a significance level of $0.000 < 0.05$. This means that it shows that variable X (Attendance) has a significant effect on variable Y (Work Discipline). According to the respondent's response, the X1 (Accurate) variable in the attendance system or measurement of working time, has a positive impact on work discipline because it allows for more accurate attendance recording and is free from errors. The high accuracy in recording employee entry and exit times helps ensure that all data is recorded correctly, so employees feel more in control and accountable for their discipline. This also increases trust between employees and management, as the evaluation of work discipline becomes more objective and transparent. On the other hand, if the accuracy of the system is compromised, such as errors in reading fingerprints or improper recording, it can damage the credibility of the system and reduce the motivation of employees to stay disciplined.

According to the respondents' responses, the X2 (On Time) variable plays a very important role in improving work discipline. Employees who are always present on time tend to have a higher level of discipline because they understand that discipline in and out reflects professionalism and responsibility. Systems that monitor punctuality, such as fingerprint attendance, encourage employees to pay more attention to their time and reduce the habit of being late. In addition, punctuality also creates a more organized and efficient work environment, which affects overall productivity. On the other hand, frequent unpunctuality can reduce team performance and lower work morale if not handled properly.

According to the respondents' responses, the X3 (Practical) variable of the attendance system or work method, has a significant influence on work discipline. A practical, easy-to-use, and efficient system tends to improve employee discipline because they don't feel overwhelmed with complicated or time-consuming procedures. When attendance or management of working time can be done quickly and without obstacles, employees are more motivated to follow the rules and show up on time. Conversely, systems that are considered

impractical or difficult to use, such as slow or complicated attendance devices, can lead to frustration and reduce employee awareness of the importance of discipline, and even bias can potentially increase tardiness or absenteeism.

CONCLUSION

Based on the results of a research conducted quantitatively with the title The Effect of the Effectiveness of the Implementation of Fingerprint Attendance on Work Discipline at PT. Terang Cahaya Abadi Sejati can be concluded as follows:

The implementation of fingerprint attendance has a positive and significant influence on the work discipline of PT. Terang Cahaya Abadi Sejati. This is evidenced by the variable X (Fingerprint Attendance) having Sig. is $0.000 < 0.05$ and the calculated t value is $3.941 > 2.05183$.

The value of the constant (a) in this research is 1.505, which means that if the variables Accurate (X1), On Time (X2), and Practical (X3) are considered to be non-existent or constant at zero (0), then the Work Discipline (Y) is valued at 1.505. The regression coefficient of Accurate with a negative value of 0.082 states that for every increase in the unit of Accurate (X1), it is estimated that the Work Discipline (Y) will decrease by 0, 082 assuming the other variable has a fixed value. The On Time regression coefficient with a negative value of 0.017 states that every increase in the unit of On Time (X2) is estimated to decrease by 0.017 assuming that other variables have a fixed value. The Practical regression coefficient with a positive value of 0.978 states that every increase in the Practical unit (X3) it is estimated that the Work Discipline (Y) will increase by 0.978 assuming that other variables have a fixed value

The obstacles that occurred at PT. Terang Cahaya Abadi Sejati is caused by several factors, namely employees experiencing urgent personal situations, such as family problems or urgent needs, employees feel that they will not be detected or faced with consequences due to the absence of strict supervision, and a lack of sense of responsibility or commitment to work. The efforts made by PT. Terang Cahaya Abadi Sejati to overcome obstacles is to check attendance regularly, use an attendance system or time tracking that monitors the attendance and whereabouts of employees during working hours, establish and communicate a clear and consistent break schedule to all employees, conduct performance evaluations and provide feedback on compliance with the rest schedule

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