

# The Influences of Occupational Safety and Health, Non-Physical Work Environment on Employee's Productivity at PT XYZ

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**Abstract:- The purpose of this research is to determine and analyze the influences of Occupational Safety and Health, Non-Physical Work Environment on Productivity at PT. XYZ. This type of research used applied research from primary data sources that are quantitative by questionnaire survey method, according to the level of expansion included in the clause associative research. The measurement scale of the data used the semantic differential scale. The sample amounted to 140 respondents. The data analysis model used regression analysis with the AMOS 24 software program. The results showed that occupational safety and health had a positive influences on productivity, non-physical work environment had a positive influences on productivity. The influences of occupational safety and health has a greater influence than the non-physical work environment. The Indicators of occupational protective equipment have the greatest influence on occupational safety and health and the opportunity to progress has the greatest influence in the non-physical work environment. If the company could provide an complete protective work equipment and provide opportunities for advancement to every employee with high achievement, productivity will increase.**

**Keywords:- Occupational Safety and Health, Non-Physical Work Environment, Productivity.**

## I. INTRODUCTION

Today's manufacturing companies are faced with stringent business challenges and its develop rapidly. This requires companies to improve product quality and improve the performance of human resources in it, in order to be able to achieve its goals and win competition with competitors. PT. XYZ is a company which engaged in the automotive component industry which produces spark plugs. At present of the company supplies its products to all automotive industries such as Yamaha, Suzuki, Daihatsu, Honda, Nissan etc., as well as distributing all of its products throughout Indonesia through distributor companies and workshops throughout Indonesia.

There's lots of problems that occur at this time one of them is the production division which faced with many problems such as less than maximum production performance, productivity that is still far below from target and so forth, besides that the relations between employees

also often become complaints, especially regarding services between colleagues and between divisions, and regarding inadequate work safety equipment and frequent problems with employee health problems departing from some of these problems, the authors feel challenged to solve these problems by conducting this research. From those data written it concluded that the employee productivity from the production of the insulator division, assembly line, and packaging during the April 2018-March 2019 period was still far below from the target that set up by the company.

There are several factors that triggered the decline in productivity of production employees section, including 1) safety and occupational health, 2) non-physical work environment. On the April 2018 - March 2019 period, there were a total of 9 work accidents that has been experienced by employees of the production department with total visited 192 employees. The results of this survey using the interview method conducted to 35 employees of PT XYZ on 15-16 April 2019 stated that the non-physical work environment was a factor that needed attention from the company. The relationships between co-workers often become complaints among fellow employees. For example, employees who work in the assembling section complain about the performance of their colleagues from the material department which is often late in sending parts.

Previous research on occupational safety and health, non-physical work environment on work productivity has been widely carried out by other researchers at different times and places namely conducted by Nining Wahyuni (2018) with a simple linear regression analysis method, Dian Septianti (2016) using multiple regression analysis techniques. Based on the previous research studies, according to the writers the one whose become a research gap because all the previous research was mostly carried out in the plantation industry, food and service industry as well as the previous studies using the SPSS, PLS that only descriptive matters. While in this research studies the authors conducted research in the automotive component industry by using the SEM-Amos program as a data processing program. Therefore, the authors conducted a research which has entitled "The Influences of Occupational Safety and Health, Non-Physical Work Environment on Productivity at PT XYZ".

**II. THEORITICAL REVIEW**

*A. Productivity*

Productivity is comparison between input and output results. According to Heizer and Render (2005), there are three important factors for increasing productivity, namely 1) labor, 2) capital, 3) the art and science of management. Edy Sutrisno (2016) revealed that to measure work productivity need indicators of 1) ability 2) increasing achievement results 3) work spirit, 4) self-development, 5) quality, 6) efficiency.

*B. Occupational Health and Safety*

Mawih & Sulistyowati, N (2019) Work safety is safety related to machinery, aircraft, work tools, materials, and processing, workplaces and their environment and ways of doing work. Occupational Health is an effort to prevent occupational diseases occurring during normal operations. Suma'mur (2001) work safety is a series of efforts to createsafe and peaceful work atmosphere for employees. Furthermore Suma'mur (2009) defines occupational health as a specialization in medical science

and its practice. Suma'mur (2005) also describes 5 indicators of occupational safety and health: 1) Work protection equipment, 2) Safe work space, 3) Use of work equipment. 4) Healthy workspace, 5) Lighting in the work room.

*C. Non-Physical Work Environment*

Budi W. Soetjipto (2008) suggested that the work environment is all things or elements that can affect directly or indirectly on the organization. According to Barry Render & Jay Heizer (2001), the study of this non-physical work environment aims to form employee's positive attitudes that could support their performance. Furthermore Budi W. Soetjipto (2008) explained the indicators of non-physical work environment consisting of: 1) harmonious relationships, and 2) opportunities to progress, 3) Work security.

*D. Thinking Framework*

From this study of the theory above, the authors formulated the thinking framework as follows:

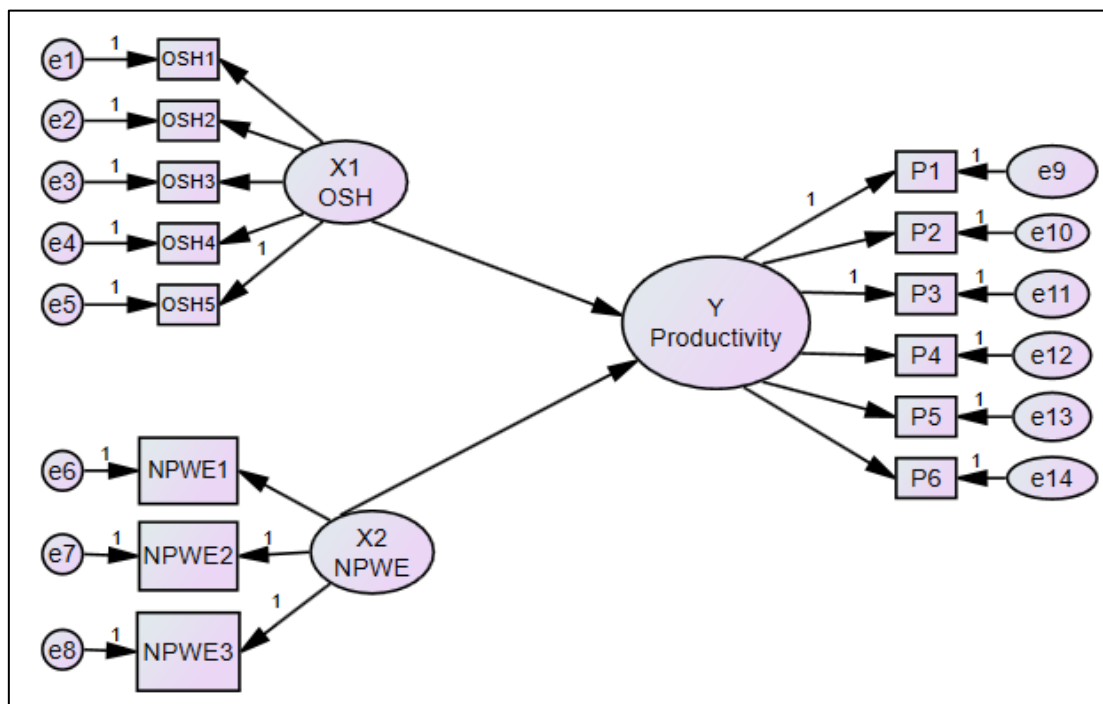


Fig 1:- Thinking Framework  
Source: Theory Study

Figure 1 explains that occupational safety and health have 5 indicators namely work protective equipment (OSH1), safe work space (OSH2), use of work equipment (OSH3), healthy work space (OSH4). Lighting in the workroom (OSH5). The non-physical work environment is divided into 3 indicators, namely: harmonious relations (NPWE1), opportunities for progress (NPWE2), security at work (NPWE3). Productivity is divided into 6 indicators, namely: ability (P1), increasing the achievement result (P2), morale / Work spirit (P3), self-development (P4), quality (P5), efficiency (P6).

**III. METHODOLOGY**

This research is applied research from primary data sources that are quantitative and included in the associative research clause, Variable studied consisted of occupational safety and health (X1), non-physical work environment (X2), and productivity (Y). The sample is part of the population Purwanto (2004). The population is 225 people directly involved in production activities with a sample of 140 people. The sampling technique uses purposive sampling technique. Data analysis techniques using SEM with AMOS software applications.

**IV. RESEARCH RESULTS**

exogenous (independent) and endogenous (dependent) variables.

**A. Confirmatory Factor Analysis Test**

The CFA test aims to determine whether all indicators (manifest variables) can explained the latent variables (constructs). This test is performed on each model of

			Estimate	S.E.	C.R.	P	Label	Std
OSH5	<==	X1_OSH	1.000					0.918
OSH4	<==	X1_OSH	.946	.053	17.888	***	par_1	0.906
OSH3	<==	X1_OSH	.856	.050	17.139	***	par_2	0.892
OSH2	<==	X1_OSH	.917	.050	18.472	***	par_3	0.916
OSH1	<==	X1_OSH	.974	.053	18.303	***	par_4	0.913
NPWE3	<==	X2_NPWE	1.000					0.876
NPWE2	<==	X2_NPWE	1.000					0.927
NPWE1	<==	X2_NPWE	.973	.057	16.963	***	par_1	0.881
P1	<==	Y_Productivity	1.000					0.842
P2	<==	Y_Productivity	.855	.058	14.840	***	par_1	0.834
P3	<==	Y_Productivity	1.000					0.892
P4	<==	Y_Productivity	.911	.051	17.777	***	par_2	0.893
P5	<==	Y_Productivity	.989	.054	18.300	***	par_3	0.902
P6	<==	Y_Productivity	1.204	.065	18.615	***	par_4	0.907

Table 1:- Probability & Standardized Estimate Output  
Source: Data Processing Results (2019)

The results of the Standardized estimate are all above 0.05. These results indicate that all indicators can explain as Occupational Safety and Health variables, non-physical work environment variables, and productivity variables.

**B. Construction Reliability Test**

According to Ghozali, (2014) states that measuring reliability in SEM it will be used composite reliability measure (CR) and variance extracted (VE) with the condition that the value of CR ≥ 0.70 and, VE value ≥ 0.50. From the calculation results, it is found that all CR and VE values above are required, thus the latent variables X1, X2 and Y meet the reliability test requirements.

Variable	CR ≥ 0,70	VE ≥ 0,50
Occupational Health and Safety	0.839	0.826
Non-Physical Work Environment	0.923	0.800
Productivity	0.794	0.772

Table 2:- Test results for Construct Reliability and Variance Extraced  
Source: Source: Data Processing Results (2019)

**C. Data Normality Test**

In the AMOS output, the evaluation of data normality is carried out by using a critical ratio skewness value of ± 2.58 at a significance level of 0.01 (1%). Data said to be normally distributed if the critical ratio skewness value is below ± 2.58 (Ghozali, 2014). Table 3 shows that all indicators of the critical ratio skewness value are below ± 2.58. Data from indicators are normally distributed and are suitable for use.

Variable	Min	Max	skew	kurtosis	c.r.
P6	4.000	8.000	-0.568	-0.801	-1.934
P5	4.000	8.000	-0.918	-0.154	-0.373
P4	4.000	8.000	-0.900	-0.137	-0.331
P3	4.000	8.000	-0.862	-0.089	-0.214
P2	4.000	8.000	-0.860	-0.502	-1.213
P1	4.000	8.000	-0.547	-0.829	-2.002
NPWE1	4.000	8.000	-0.592	-0.520	-1.256
NPWE2	4.000	8.000	-0.556	-0.810	-1.955
NPWE3	4.000	8.000	-0.427	-0.745	-1.799
OSH1	4.000	8.000	-0.812	-0.305	-0.736
OSH2	4.000	8.000	-0.941	-0.118	-0.284
OSH3	4.000	8.000	-0.955	0.163	0.393
OSH4	4.000	8.000	-0.748	-0.461	-1.113
OSH5	4.000	8.000	-0.952	-0.275	-0.664
Multivariate				6.131	1.714

Table 3:- Assessment Results of Normality  
Source: Data Processing Results (2019)

**D. Data Outliers (Extreme Figures)**

Outliers is observations that emerge with extreme values both univariate and multivariate. Outlier data can be seen from mahalanobis distance values that have p1 and p2. A data could said outlier if the value of p1 and p2 produced is < 0.05. From the AMOS output it can be seen that there is no data that has values of p1 and p2 <0.05.

**E. Goodness of Fit Test**

Model structure test results and data modification obtained Goodness of Fit results:

GOF Index	Cut-Off Value	Output	Information
Chi-Square	Lower	60.363	Good Fit
CMIN/DF	< 2.00	0.915	Good Fit
Probability	≥ 0,05	0.673	Good Fit
RMSEA	≤ 0,08	0.000	Good Fit
GFI	≥ 0,90	0.945	Good Fit
AGFI	≥ 0,90	0.913	Good Fit
NFI	≥ 0,90	0.976	Good Fit
RFI	≥ 0,90	0.967	Good Fit
TLI	≥ 0,90	1.003	Good Fit
IFI	≥ 0,90	1.002	Good Fit
CFI	≥ 0.90	1.000	Good Fit

Table 4:- Test Results for Goodness of Fit Models  
Source: Data Processing Results (2019)

Overall Goodness of Fit can be assessed based on a minimum of 5 (five) criteria that are met (Ghozali, 2017). So it can be concluded that in the results of this research the entire model is considered feasible and meets the Goodness of Fit criteria so that it can be proceed to the hypothesis testing stage to find out how much influence between occupational safety and health variables (X1), non-physical work environment (X2) on productivity (Y).

F. Hypothesis Test Results

The relationship between constructs in the hypothesis is shown by the regression weights value (Ghozali, 2014). The results of the hypothesis test output are explained in Figure 2 as follows:

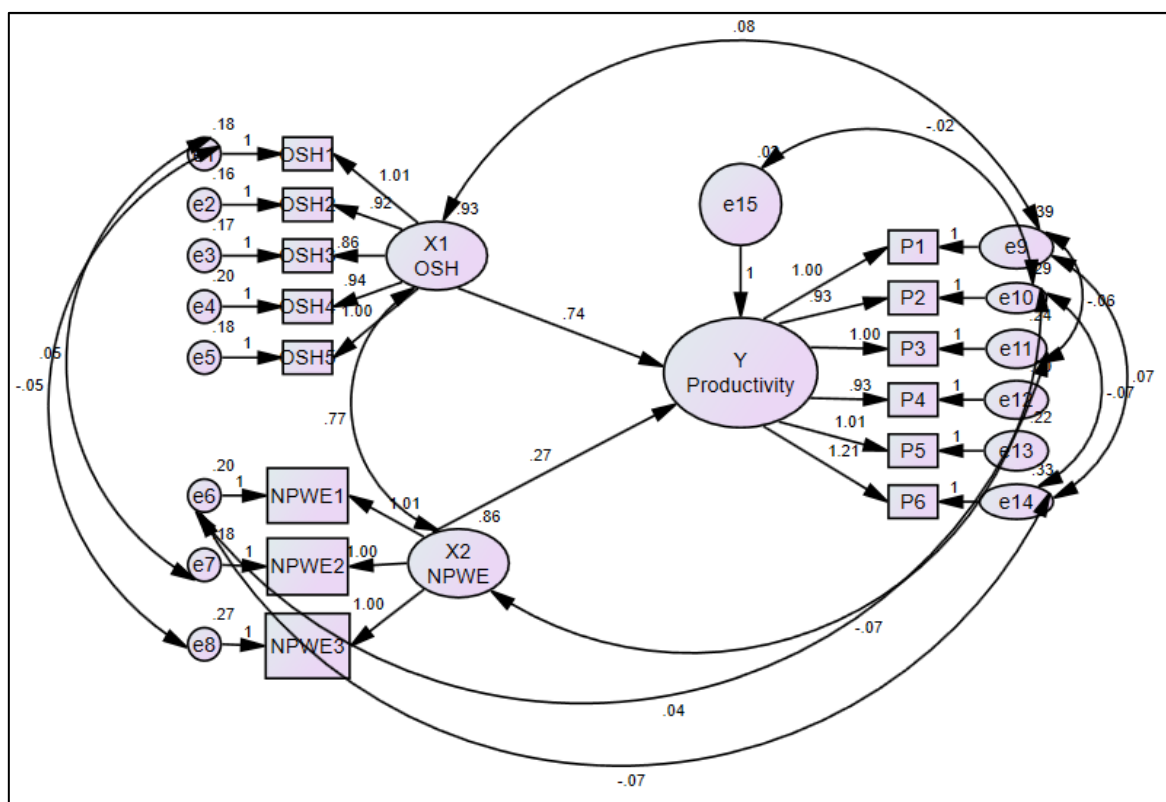


Fig. 2:- Hypothesis Test Output Results  
Source: Data processing results (2019)

Figure 2 above is the hypothesis test output and the results of the hypothesis test output are summarized in table 5 below.

			Estimate	S.E.	C.R.	P	Label	Std
Y_Productivity	< ==	X1_OSH	.739	.075	9.795	***	par_10	.750
Y_Productivity	< ==	X2_NPWE	.271	.073	3.704	***	par_11	.265

Table 5: Hypothesis Test Output Results  
Source: Data processing results (2019)

The results of the analysis in Table 5 show that in the H1 hypothesis, occupational safety and health (X1) have a positive effect on the Productivity variable (Y) with a significance level of 0.001. The estimated parameter value is 0.750. Thus the H1 hypothesis in this research which

states that Occupational Safety and Health (X1) has a significant effect on Productivity (Y) is accepted. This shows that if there is 1 unit of value for occupational safety and health it will increase productivity by 0.750. These results are in line with previous research conducted by

Nining W (2018), Muhammad, Busyairi (2014), and Anindya Novita K (2017). These results indicate that the better occupational safety and health, so that the productivity will increase, to maximize the benefits of occupational safety and health, management should be strict in implementing controls on the implementation of occupational safety and health.

Furthermore, the analysis results in Table 4.11 show that in the H2 hypothesis the non-physical work environment variable (X2) has a positive effect on the Productivity variable (Y) with a significance level of 0.001. The estimated parameter value is 0.265. Thus the H2 hypothesis in this research which states that the Non-

Physical Work Environment (X2) has a significant effect on Productivity (Y) is accepted. This shows that if there is 1 unit of value for the non-physical work environment it will increase productivity by 0.265. The results of this research are in line with previous studies conducted by Intan Joseph (2016), Dian, Septianti (2016), and Adi Irawan Setiyanto (2016). These results indicate that the better the non-physical work environment, so the productivity will increase, to maximize the non-physical work environment, the management should be firm in implementing controls on the implementation of relations between employees, providing opportunities to move forward and maintain of work security, so that implementation can run maximally.

			Estimate	S.E.	C.R.	P	Label	Std
OSH5	< ==	X1_OSH	1.000					.914
OSH4	< ==	X1_OSH	.942	.053	17.806	***	par_1	.898
OSH3	< ==	X1_OSH	.864	.049	17.789	***	par_2	.897
OSH2	< ==	X1_OSH	.916	.049	18.583	***	par_3	.911
OSH1	< ==	X1_OSH	1.006	.052	19.173	***	par_4	.915

Table 6:- Estimated parameter values of variable X1 against the indicator  
Source: Data processing results (2019)

Table 6 explains that the strongest relationship between occupational safety and health variables is explained by occupational protective equipment (OSH1) with a loading factor value of 0.915. then lighting (OSH5) with a loading factor value of 0.914, safe workspace (OSH2) with a loading factor value of 0.911, healthy workspace (OSH4) with a loading factor value of 0.898 and the weakest is an indicator of the use of work equipment (OSH3) with a loading value factor 0.897. This result shows the respondent's perception of the company is that employees expect the availability of complete work

protective equipment so that it is expected with the availability of complete work protective equipment, occupational safety and health will be more optimal, employees want adequate lighting in the work space, not too dark or not too bright or dazzling, want a workspace that is safe from all threats of work accidents, employees want to be able to avoid all kinds of disease disorders caused by occupational diseases, and the company must continue to diligently provide guidance on the use of good and true work protective equipment for each employees.

			Estimate	S.E.	C.R.	P	Label	Std
NPWE3	< ==	X2_NPWE	1.000					.873
NPWE2	< ==	X2_NPWE	1.000					.909
NPWE1	< ==	X2_NPWE	1.008	.055	18.363	***	par_5	.903

Table 7:- Estimated parameter values of variable X2 against the indicator  
Source: Data processing results (2019)

Table 7 explains that the strongest relationship between non-physical work environment variables is explained by the opportunity to progress (NPWE2) with a loading factor of 0.909. Then a harmonious relationship (NPWE1) with a value of loading factor 0.903, the weakest is the safety indicator at work (NPWE3) with a loading factor value of 0.873. Respondents' perception of the company is that the company must provide opportunities to advance both in giving promotions, and in the form of rewards to every employee who excels in carrying out his work in order to get more results. Then second one the company must be able to maintain a harmonious

relationship and maintain good conduciveness among fellow employees, the company must provide training and seminars on the importance of work relations between fellow employees, namely the relationship from one person to another within the company. Next the third one is work security. Respondents assess the company must be able to maintain security in the work environment within the company in this case especially the security of the personal property of employees who are in the company environment.

		Estimate	S.E.	C.R.	P	Label	Std
P1	< ==	Y_Productivity	1.000				.800
P2	< ==	Y_Productivity	.931	.059	15.733	***	par_6
P3	< ==	Y_Productivity	1.000				.888
P4	< ==	Y_Productivity	.934	.051	18.295	***	par_7
P5	< ==	Y_Productivity	1.009	.054	18.589	***	par_8
P6	< ==	Y_Productivity	1.211	.062	19.518	***	par_9

Table 8:- Estimated parameter values of Y variable against the indicator  
Source: Data processing results (2019)

In Table 8 its explains that the strongest relationship of productivity variables is explained quality (P5) with a loading factor value of 0.898. Then efficiency (P6) with a loading factor value of 0.895, self-development (P4) with a loading factor value of 0.894, then morale (P3) with a loading factor of 0.888. Improve the achievement results (P2) with a value of loading factor 0.886. and the weakest is the ability indicator (P1) with a loading factor value of 0.800. Respondents considered that the quality should be always in maintained with quality assurance programs such as the ISO 9001 Quality System and the IATF Special Quality System for the Automotive Industry must be implemented properly. Furthermore, the respondent's perception of efficiency is a comparison between the results achieved with the overall resources used must be optimal because efficiency is an aspect of productivity that provides a significant influence for employees. Then the respondents considered that absolute self-development always must be done, employees should be develop themselves to improve the work skills. Then the spirit of work, this is an effort to be better than yesterday. Respondents considered that each employee must try to improve the achievement results of it. in this case the results are really something that can be felt both by those who work and who enjoy the results of the work. Then the last respondent assessed to increase productivity, it must have the ability to carry out tasks.

## V. CONCLUSION AND SUGGESTIONS

### A. Conclusion

Based on the results of data analysis, the following conclusions can be drawn:

- Statistical test results show as well as prove has positive influence between occupational safety and health on productivity where if there is 1 unit of value for occupational safety and health it will increase productivity by 0.750. These results indicate that the better occupational safety and health, so that the productivity will increase. The strongest relationship between occupational safety and health variables is explained by work protective equipment with a loading factor value of 0.915, then the second is lighting with a loading factor value of 0.914, the third is a safe work space with a loading factor value of 0.911, the fourth is a healthy workspace with a loading factor value of 0.898 and the weakest one is an indicator of the use of work equipment with a loading factor value of 0.897.

- The results of statistical tests show as well as prove has positive influence between the non-physical work environment on productivity, this shows that if there is 1 unit of value for the non-physical work environment it will increase productivity by 0.265. These results indicate that the better the condition of non-physical work environment, the productivity will increase, the strongest relationship of non-physical work environment variables is explained by the opportunity to move forward with a loading factor of 0.909, then a harmonious relationship with the loading factor of 0.903, and the weakest one is an indicator safety in work with a loading factor of 0.873.

### B. Suggestion

The suggestions made by the author for the company are this follows:

- In occupational safety and health test results shows that the indicators of occupational protective equipment have the highest value of influence, this should be a concern of the company so that it could get more attention to the availability of protective equipment which is more complete accordance to the work area. It is expected that if the availability of complete protective work equipment will increase the employee productivity.
- Companies should be more active in disseminating information about the importance of occupational safety and health in order to reduce the number of workplace accidents and maintained the health of employees and also the company should be able to foster awareness of the importance of working safely, healthily and safely through the training on safety and health programs.
- Companies should more often hold coaching health clinics on a regular basis regarding relationships between the employees in the workplace. So it could make work situation continues to conducive and create good team work among fellow employees.
- The company should provide an opportunity to progress for every employee who has good achievements in the form of promotion and additional benefits, so employees are expected to continue and enthusiastic in increasing the productivity.
- Companies should continue to provide training on awareness of the importance of maintaining quality so that employees would continue full motivated to improve the quality of the past.

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