Improvement of cinnamon (C. burmanii) sorting and grading through influencing factors

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Abstract. Labour productivity influenced by work-in-process, labour skills, machineries and working environment. This study identified factors affecting the labour during sorting and grading of cinnamon. Five factors used as independent variables, namely working motivation (X1), working environment (X2), salary (X3), age (X4) and workload (X5). Factors then correlated with labour performance (Y) as dependent variable. Samples were randomly selected from respondents, of the Rasdi Fo & Co. Personal characterization calculated from employee’s years of service. Results then grouped according to the labour experienced, and statistical analyses were set according to F test, t test, power function, and influence factors. These methods used to analyse the working environment, in correlation to the employee performance, room temperature, humidity, lighting, and noise levels. From the results, X2, X3, X4 and X5 had no significant effect, while Y can be described as a function of 2.06(X1 0.326)(X2 0.016)(X3 0.170)(X4 0.479)(X5 0.172). Maximum room temperature recorded at 38.4°C, while minimum temperature recorded at 29.3°C, lower than the ideal level. Maximum and minimum humidity (RH) was 91.3 % and 59.2 %, respectively. The RH in working environment exceed normal level. The noise level recorded between 48.8 dBA and 78.4 dBA, which classified as normal without ear protection.

1. Introduction
In 2016, the plantation sub-sector contributed USD 45.54 billion to Indonesian economy [1]. Factors of production in plantation included land, labour, capital, and entrepreneurship [2]. Labour contribute by employee in the production, and act as a resource to produce goods or services. Labours greatly affect the company's efforts to increase productivity [3]. Number of labours greatly affects the productivity. Furthermore, labours allocation determined the productivity in the future [4]. In addition, productivity influenced by working procedures, skills of labours, machineries, and working conditions [5]. The number of output when compared to work force should be maximum to increase the productivity and revenue [5]. Higher labour productivity is one of key factor for utilizing human resources to the maximum level [6].

Productivity of labour measured by the percentages of finished assignment during the work period. Performance produce benefits and increased company's performance [7]. There are several factors related to the employees’ demand; sufficient salary, job security, co-workers, respect, meaningful work, career opportunity, fair and wise leader, reasonable direction and command, and the
place of work [8]. In the plantation industry, identification of factors that affect the workforce is necessary.

In west Sumatra, cinnamon is the main plantation product [9], which required labour-intensive sorting and grading process [10]. The problems faced by labours is the task of sorting and grading require the ability to focus on completing the work properly. Error will result in labours repeating the work. To improve performance of labours the working conditions should be improved. Moreover, labour have to be able to make decisions properly to segregate substandard products. In addition, working efficiency should promote labour productivity.

Labour productivity influenced by work-in-process, labour skills, machineries and working environment. This study identified factors affecting the labour during sorting and grading of cinnamon. Five factors used as independent variables, namely working motivation (X1), working environment (X2), salary (X3), age (X4) and workload (X5). Factors then correlated with labour performance (Y) as dependent variable. Samples were randomly selected from respondents, of the Rasdi Fo & Co. Personal characterization calculated from employee’s years of service

The study will improve productivity of the Rasdi Fo & Co. with similar number of workforce. The company is specialized in exporting cinnamon from West Sumatra. It is necessary to achieve the output increment significantly through this study. Through improvement in sorting and grading process, it is foreseeable that the company’s cinnamon export can deliver 100 tons per month.

2. Materials and methods
This research started from April to May 2015. The sample was Rasdi Fo & Co warehouse. The warehouse accommodate goods movement, raw materials sortation, materials’ weighing and drying, as well as employees’ main activities. The most crucial production process is the sorting and grading, for segregating cinnamon according to its quality and grade. Sortation performed by non-permanent employees, while grading done by labours.

For measuring the parameters under consideration, a Sound Level Meter (SLM) was used to measure the noise of machineries and labours activities. The Light Meter was used to measure the intensity of light in the working environment. Thermo hygrometer was used to measure temperature and humidity inside the warehouse. For data processing and statistical analysis, a statistical engineering software was used.

The study stressed on labours activity during sorting and grading of cinnamon at the Rasdi Fo & Co. Several factors identified as influencer, namely working motivation (X1), working environment (X2), salary (X3), age (X4) and workload (X5). Factors then correlated with labour performance (Y) as dependent variable. Most influence variables, regression and mathematical models were developed and selected according to the hypothesis of power function as follow:

\[ Y = i_0 a_0 \times X_1 a_1 \times X_2 a_2 \times X_3 a_3 \times X_4 a_4 \times X_5 a_5 \] .....

Where Y = Labour Performance
X1 = Working Motivation
X2 = Working Environment
X3 = Salary
X4 = Labour’s Age, and
X5 = Employee’s Workload

This equation will be used as a reference for planning new system for improving the company’s efficiency. The equation also will measure the labour productivity as well as how the labours performed upon sorting and grading the cinnamon in the company’s warehouse. The factors influencing the labour performance described in Figure 1.
Samples in this study was company’s labours. The sampling method follow [11]. The labours population was considered as the whole object of this study. Total employees selected as samples in the sorting and grading process were 70 person. Samples considered as partial characteristics of the population in the company [11]. Samples considered as a whole population. According to [12], number of samples determined according to their purpose to serve as respondents. The study used the samples number greater than 25% of the population [12].

The samples randomly selected to present a heterogeneous population. Nonetheless, a stepwise classification of the population was performed to group the sub-populations according to their characteristics. Each sub-population have a homogeneous membership. Moreover, each sub-population then randomly selected. Subsequently, each employee in the sub-population then characterized according to his/her years of service. Therefore, employee records were evaluated to identify historical data for each employee who was selected as a respondent. According to employee’s years of service, they then grouped according to the tenure ship, to represent the entire population.

In order to identify the functional and influential variables, five parameters were introduced. Each variable was measured using Likert scale [13]. A Likert scale is a psychometric scale commonly involved in research that employs questionnaires. It is the most widely used approach to scaling responses in survey research. It is interchangeable with rating scale. In this study, the Likert scale used to measure attitudes, opinions, and perceptions of respondent towards the social phenomenon [14]. The study specifically assigns the social phenomena. It referred as the object variables. The Likert scale grade according to the answer of the respondent. The scale ranged from very positive to very negative, which include:

- SA = Strongly Agree
- A = Agree
- LA = Less Agree
- D = Disagree, and
- SD = Strongly Disagree

Data analysis technique in this study employed goodness of fit test. The test was a non-parametric that used to find out how the observed value of a given factor significantly different from the expected value. In the goodness of fit test, the observed sample distribution then compared with the expected probability distribution. The test will determine how well distribution of dependent variables fits the empirical distribution. The test then followed by a free-model classic-assumption test. In addition, a
statistical justification test then used as a complementary test. The later test will give goodness-of-fit test models view concerning the accuracy of the samples regression function. The accuracy is important to assess the actual value of the model. The model then measured statistically by the coefficient of determination, the value of $F$ and $t$ statistical test [14].

Subsequently, the coefficient of determination ($R^2$) was determined to measure the proportion of the variance in the dependent variable ($Y$) that is predictable from the independent variables ($X_1$, $X_2$, $X_3$, $X_4$, $X_5$). The $R^2$ used in the context of statistical models. It main purpose was the prediction of the testing of hypotheses based on independent variables information. The $R^2$ measured how the model replicates well-observed outcomes, based on the proportion of total variation of outcomes explained by the model [15]. The coefficient of determination value is between 0 and 1. The low value means the ability of the independent variables in explaining the variation of the dependent variable is very limited. A value close to 1 mean the independent variables provide almost all the information needed to predict the dependent variables.

Moreover, an $F$-test performed to produce statistical test of $F$-distribution under the null hypothesis. The $F$-test used for comparing the models that had been fitted to independent variables, in order to identify the model that best fits the population from which the data were sampled [16]. The $F$-tests tested the models to the data using least squares. In addition, this test used to evaluate the jointly independent variables can significantly explain the dependent variable in a quadratic (power) function.

A $t$-test then used to identify whether each independent variable ($X_1$, $X_2$, $X_3$, $X_4$, $X_5$) has a significant influence on the dependent variable ($Y$). The $t$-test is a type of inferential statistic used to determine if there is a significant difference between the means of two groups, which can be related in certain features. It is used since the data sets was expected to follow a normal distribution with unknown variances. The $t$-test results will describe the $t$-statistic, $t$-distribution values, and the degrees of freedom. It is necessary to determine the probability of difference between five sets of data. Since the independent variables consist of five variables, this study also employed an analysis of variance.

The rank-dependent expected utility model was used to determine the influence of each independent variable ($X_1$, $X_2$, $X_3$, $X_4$, $X_5$) to the dependent variable ($Y$) in the study. The calculation was based on the Eq. 1.

In this study, the working environment conditions was considered as factors that affect the employee performance. The air temperature and humidity need to regulate properly. Workers who are uncomfortable in the working environment are less productive [17]. The air temperature states the degree of an object temperature. It was measured by thermometer. A thermo hygrometer was used to measure temperature and humidity together. According to the Health Requirements for Work Environment Office and Industrial Temperature, the standard working temperature is between 18°C - 28°C [18]. Air moisture (humidity gauge) is the amount of moisture in the air (atmosphere). Humidity is the concentration of water vapor in the air. Air humidity is the level of wetness in the air-conditioned air because the water is always contained in the form of water vapour. The concentrations of the numbers can be expressed in absolute humidity, specific humidity or relative humidity. The Health Requirements for Office Work Environment and Industry standards Humidity is 40% - 60% [18].

Lighting is the amount of light in a field that is necessary to implement activities effectively. Health Requirements for Office Work Environment and Industry standard for light intensity in the workspace had to be at least 100 lux [18]. The principle of good lighting is the amount and intensity of lighting required should be tailored to the type of work, the vision of man and the environment. The tools used to measure the intensity of light is Lux meter. To measure the lighting used measurement techniques of Local Lighting.

Noise is the unwanted sound that disrupts or harmful to health. In other words all sound unwanted by the recipient is regarded as noise. A person tends to ignore the noise when it naturally accompanies the work, such as typewriters or machines in the factory. The noise source can be grouped into two categories, namely: (1) interior noise, it can be tools such as cars, motors, fans, air conditioning, television, radio, vacuum cleaner, drilling machines, and (2) outdoor, like the sound of rain, wind,
flowing water. High-frequency noise is more disturbing than the low-frequency noise. Generally noise bias generating far greater interference at night than during the day. The Environmental Health Office Work and Industry standard noise level in the workspace without protective should be no more than 85 dBA [18]. Noise measurements carried out by using the Sound Level Meter. The working principle of this tool is to measure the sound pressure level. Deviation in sound pressure by atmospheric pressure caused by the vibration of air particles is expressed as the amplitude of the pressure fluctuations.

3. Results and discussion

3.1. Sorting and grading

Cinnamon processing done manually and mechanically. For mechanical process performed after a cinnamon skin sorted from random quality and then continue grading cinnamon skin based on a predetermined quality qualification for the cutting of export demand. The grading classification that is used by the company is KAA long stick, KAA per 5 and 8 cm, KA, KB and KC. So based on that classification, the company using labour in two groups: daily and contract. Daily labours are paid based on the quantity that they can get. The difference with the contract employees, they sorted the cinnamon skin at random and after clustered into KAA, KA, KB, KC and after that the daily labours continue the grading process. Working capacity of the average of the daily contract labours is 325-340 kg / day. This condition still can be improved, for that, we analysed further in order to maximize productivity/performance of the human resources that we have. The objective of this research is to identify factors that influence the labour in sorting and grading cinnamon skin department the most using the t test, t test and analysis using the equation of power function.

The working environment of employees sorting and grading of cinnamon skin is not much different from the nut, only they are indoor in the process of sorting and grading cinnamon skin. Goods received at random quality, which will be graded or grouped into KA, KB, KABC, and KBBC. Labours performing sorting and grading for cinnamon skin divided into two, which are ‘permanent’ and ‘daily’. A permanent worker salary based on the quantity that they could get. The difference with daily employee is they sort cinnamon skin at random and after grading/clustered into KA, KB, KABC, and new KBBC ‘daily’ employees will do the rest of the job. Wage of labour contract for cinnamon grading was KA / KB = Rp. 175/kg. On average, they can sorted 325 kg/day. Work equipment used by the labour contract cinnamon bark is a hat, knife cutter, masks, gloves. Cutting machine tools, if there is demand for cutting and grinding machines to make clean broken cassia Vera is done by daily labour. Figures concerning the description of the place is still undetermined. Therefore, it was excluded in this study. The accuracy of the regression function in assessing the actual value can be measured from the Goodness of Fit, coefficient of determination, the value of F statistics and statistical values t.

3.2. Test the coefficient of determination (R2)

The coefficient of determination (R2) reflects how much of the variation of the dependent variable Y can be explained by the independent variable X, or in other words how big X contributed to Y. The coefficient of determination used to test goodness-fit of the regression model can be seen from the value R Square. The R2 can be seen in Table 1.

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|---|----------|-------------------|---------------------------|
| 1     | .859a | .738     | .644             | .01320                   |

| a. Predictors: (Constant), X1, X2, X3, X4, X5 |
| b. Dependent Variabel: Y |

To determine the level of employee performance sorting and grading the company is influenced by several factors, which are (work motivation, work environment, salary, age and workload) can be
seen through the coefficient of determination. In Table 1 the value of R Square is 0.738. This may imply that amounted to 73.8% of the labour performance sorting and grading the company can be explained by the work motivation (X1), work environment (X2), salary (X3), age (X4) and workload (X5), while the remaining 26.2% is explained by other factors not examined.

3.3. Simultaneous test (Test F)
F-test is used to verify whether the independent variable (work motivation, work environment, salary, age and workload) together (simultaneously) has significant influence either positive or negative, on the dependent variable (performance). F test results in this study can be seen in Table 2 below:

| Model     | Sum of Squares | df | Mean Square | F      | Sig.   |
|-----------|----------------|----|-------------|--------|--------|
| 1         | Regression     | .007| 5           | .001   | 7.876  |
|           | Residual       | .002| 14          | .000   |        |
|           | Total          | .009| 19          |        |        |

a. Predictors: (Constant), X1, X2, X3, X4, X5
b. Dependent Variable: Y

From the test results F on this study, calculated F value of 7.876 with a significance of 0.001 numbers. With the 95% significance level (\( \alpha = 0.05 \)). Based on the test results F above, the H1 is accepted. This means that motivation, work environment, salary, age and workload jointly significant effect on employee performance sorting and grading.

3.4. Significant partial test parameters (t test)
In partial statistical test with the critical t value (critical value) on df = (n-k), where n is the number of samples and k is the number of independent variables including constant.
Here is the t test results in this study and can be seen in Table 3.

| Model     | Unstandardized Coefficients | Standardized Coefficients | t     | Sig. | Tolerance | VIF |
|-----------|-----------------------------|---------------------------|-------|------|-----------|-----|
| 1 (Constant) | .314                        | .353                      | .512  | .889 | .389      |     |
| X1        | .328                        | .141                      | .552  | 2.328| .035      | 2.999|
| X2        | .016                        | .110                      | .040  | .147 | .885      | 3.908|
| X3        | .179                        | .442                      | .152  | .404 | .693      | 7.528|
| X4        | .479                        | .378                      | .413  | 1.268| .225      | 5.657|
| X5        | -.172                       | .175                      | -.162 | -.980| .343      | 1.456|

a. Dependent Variable: Y

From the results of the t test. This research on the value of X2, X3, X4 and X5 t count is less than the t table of 2.101 and significance figure >0.05. This means that H0 is accepted. Only the variable X1 in accordance with the rules of regression. In the variable X1 t count value greater than 2.101 and the number of significance < 0.05. This means that H1 is accepted. Variable work motivation (X1) partially influence on employee performance sorting and grading.
3.5. Rank or rank utility functions (power function)
Based on statistical calculations performed by using SPSS 17, the obtained results in Table 4.

Table 4. Results of SPSS for designation function (power function)

| Model | Unstandardized Coefficients | Standardized Coefficients | Collinearity Statistics |
|-------|-----------------------------|---------------------------|-------------------------|
|       | B   | Std. Error | Beta | t    | Sig. | Tolerance | VIF |
| 1 (Constant) | .314 | .353 | .889 | .389 |
| X1    | .328 | .141 | .552 | 2.328 | .035 | .333 | 2.999 |
| X2    | .016 | .110 | .040 | .147 | .885 | .256 | 3.908 |
| X3    | .179 | .442 | .152 | .404 | .693 | .133 | 7.528 |
| X4    | .479 | .378 | .413 | 1.268 | .225 | .177 | 5.657 |
| X5    | -.172 | .175 | -.162 | -.980 | .343 | .687 | 1.456 |

a. Dependent Variable: Y

Based on SPSS output above, it obtained the rank of the following functions:

\[ Y = 2.06 \times X_1^{0.328} \times X_2^{0.016} \times X_3^{0.179} \times X_4^{0.479} \times X_5^{-0.172} \]

The model shows that:
1. Constant = 2.06
   If the work motivation, work environment, salary, age and workload assumed 0 then the performance of employees will increase by 2.06.
2. The coefficient of work motivation \( X_1 = X_1^{0.328} 
   Coefficient value of 0.328 motivation to work in the rank function, stating that there is an increase every one score for motivation to work will be followed by an increase in the employee's performance of (\(^0.328\)) with the assumption that the independent variables other than the rank function is fixed.
3. Work environment coefficient \( X_2 = X_2^{0.016} 
   Work Environment coefficient values indicate a figure of 0.016 in the rank function, stating that in the event of an increase of 1 scores for the work environment will be followed by an increase in employee performance by (\(^0.016\)) with the assumption that the independent variables other than the rank function is fixed.
4. Coefficient salary \( X_3 = X_3^{0.179} 
   Salary coefficient values indicate a figure of 0.179 in the rank function, stating that if there is an increase 1 score for Salary will be followed by an increase in employee performance by (\(^0.179\)) with the assumption that the independent variables other than the rank function is fixed.
5. Coefficient age \( X_4 = X_4^{0.479} 
   Age coefficient values indicate a figure of 0.479 in the rank function, stating that if there is an increase 1 score for rank in seniority will be followed by an increase in employee performance by (\(^0.479\)) with the assumption that the independent variables other than the rank function is fixed.
6. Coefficient workload \( X_5 = X_5^{-0.172} 
   Workload coefficient values indicate a figure of 0.172 and a negative sign in function rank, claimed that there was a relationship in the opposite direction with the employee's performance. This implies that every increase of 1 score variable (Y) will decrease by (\(^-0.172\)) with the assumption that the independent variables other than the rank function is fixed.
3.6. Working environment as factors affecting employee performance.

3.6.1. Temperature and humidity. According to the Terms of the Minister of Health of the Republic of Indonesia No. 1405/MENKES/SK/XI/2002 About Terms Environmental Health Office Work and Industry, the standard temperature is 18 °C - 28 °C. Based on the results of measurements showed the maximum temperature was 38.44 °C and a minimum temperature was 29.33 °C. This shows the air temperature in the room sorting and grading work cinnamon bark has exceeded a predetermined standard.

As for humidity, according to the Terms of the Minister of Health of the Republic of Indonesia Nomor1405/MENKES/SK/XI/2002 on Health Requirements for Work Environment Office and Industrial. Standard humidity is 40 % - 60 %. Based on the results of measurements showed a maximum humidity of 91.3 % and minimum humidity of 59.2 %. This indicates the humidity in the room sorting and grading cinnamon skin absolute dominant does not meet the standards set.

Maintaining consistent temperature and humidity resulting in a comfortable working condition. Temperature lower than necessary will produce significant differences with outdoor temperatures. This result of the workers constantly requesting a higher or more suitable temperature. Workers need good condition to work effectively. High humidity caused by high moisture content in the working environment will make workers will feel clammy, warm, drowsy, and sluggish. Indoor humidity should fall between 30 and 50 percent compare to outdoor. Humidity higher than 50 percent may lead the workers to feel the effects of heavy, moist air.

In contrast, too low humidity lack of sufficient moisture in air. The condition will produce too cold and dry feeling, thus preventing the workers for comfort. Low moisture levels can cause itchy skin, rashes, sore throat, coughing, and a stuffy nose. Employees can regularly experience any or a combination of these symptoms. “Sick building syndrome,” is a common term for cases in which employees miss work frequently due to an illness that can be attributed to their work environment. A good working environment should have humidity regulator, such as humidifier. Other approach can be done by bringing in some potted plants, which release moisture. When the humidity fluctuated, it will caused a poor indoor air quality. Humidity has a major effect on the perceived temperature. Regulating temperature can improve employee comfort while also helping save energy costs.

3.6.2. Lighting. Minister of Health of the Republic of Indonesia No. 1405/MENKES/SK/XI/2002 About Terms Environmental Health Office Work and Industry, the standard light intensity in the workspace of at least 100 lux. Based on measurements, the light intensity is highest in the sorting and grading room with value of 28.2 and 102 lux on May 12, 2015 at 13.00. The lowest measurement at 70 lux measured on May 11, 2015 at 07.00. This is due to coincide during the day and plus direct sunlight on employment. Thus, when compared with the standards set by the Minister of Health of the Republic of Indonesia No. 1405/MENKES/SK/XI/2002 can be said to be the level of lighting in the room sorting and grading cinnamon skin meet the standards set.

3.6.3. Noise. Noise is the unwanted sound that disrupts or harmful to health. Humans are still able to hear sounds with frequencies between 16-20000 Hz, and the intensity with a threshold value (NAV) of 85 dB (A) continuously. The intensity of more than 85 dB can cause interference and this limit is called the critical level of intensity. According to Minister of Health of the Republic of Indonesia No. 1405/MENKES/SK/XI/2002 About Terms Environmental Health Office Work and Industry, the standard level of noise in the workspace without protective up to 85 dBA. Based on the measurements that have been done, the noise level is highest at 78.4 dBA and 48.8 dBA lowest measurement. This indicates that the noise level is quite normal and can be categorized as a safe zone without protection, so because the noise level is relatively normal then it will not cause health problems both physical (deafness) or psychological (stress from too noisy).
3.7. Recommendation for workforce performance improvement

3.7.1. Work motivation. Simultaneously and partially work motivation influence on labour performance in sorting and grading cinnamon skin, especially partially, because the gain is significantly smaller than 0.05 so the H1, which reads "work motivation influence on labour performance in sorting and grading cinnamon skin" be acceptable. This shows that with good motivation in working will obtain maximum performance while employees with less motivation will result in low employee performance. This is consistent with the the Handoko’s theory (2001) which states that motivation is one of the factors that can affect the performance of employees. Related to that opinion, someone who is motivated to work then the resulting performance will be optimal.

Based on the results of the research found a low indications on work motivation variable on safety and social needs. This condition can be seen from the respondents responds that the need to guarantee a better future and the work safety from the company. It can be accommodated by giving pension and also health insurance.

3.7.2. Work environment. The working environment has not been a big influence on labour performance at sorting and grading. This condition is based on the results of measurements of temperature and humidity of workplace that exceeds the standard and indication of a less satisfactory from questionnaire towards the available facility. Therefore, in the future, the company is advised to pay more attention to the working condition of employees, for example by adding ventilation holes or vent so the temperature and humidity so the same as [18]. Furthermore, the company need to conduct periodic evaluation of the available facilities, so it will be clear which ones need to be improved or not, so the employees can work safely, comfortably, and optimally.

3.7.3. Salary. Based on the analysis, the salary indicators simultaneous influence on employee performance. It is inversely proportional to the resulting performance. The suggestion for the company should pay more attention on employee financial, by giving bonuses periodically to cover the lack from salaries received by employees. For the record, average daily performance of employees is 325 kg with a wage of Rp 175/kg, equivalent to daily salary of Rp 56875 and monthly salary of Rp. 1478750. This value is still below the minimum wage of Rp 1615000/month.

3.7.4. Age. From the results of the analysis, age was very influential indicators simultaneously on employee performance. Which mean age directly proportional to the employee's performance. It is expected that the company always maintain and even increase the number of productive working age, because productive age can work more optimally based on standards established by the company.

3.7.5. Workload. Based on the analysis, the workload is inversely related to employee performance. That is a good performance if the workload is reduced. However, a possibility that it could be minimized. It is related to work environment factors related to the availability of facilities and Personal Protective Equipment (PPE), so once again proposed to maximize the facilities of an enterprise to its employees in order to obtain optimal performance.

4. Conclusions

From the F-test, work motivation, work environment, salary, age and workload have significant effect on employee performance at sorting and grading cinnamon skin department, was proven by the calculated F value of 7.876 with a significance of numbers 0.001 with a 95 % significance level (α = 0.05), the H1 is accepted. From the results of t-test analysis, X2, X3, X4 and X5 t count is smaller than t table of 2.101 and the number of significance > 0.05, then H0 is accepted. Only X1 variable in accordance to the rules of regression. In the variable X1 t count, value greater than 2.101 and the number of significance < 0.05, so that H1 is accepted. Work motivation variable (X1) partially influence the employee performance in sorting and grading of cinnamon skin department. The Power Function produced is \[ Y = 2.06 \times X_1^{0.328} \times X_2^{0.016} \times X_3^{0.179} \times X_4^{0.479} \times X_5^{-0.172} \]. Based on the measurement
obtained, the results of the maximum temperature of 38.44 °C and a minimum temperature of 29.33 °C. This shows that air temperature in the room of sorting and grading of cinnamon skin has exceeded the prescribed standards and measurements obtained, the maximum humidity was 91.3 % and minimum humidity was 59.2 %. This indicates that humidity in the room of sorting and grading cinnamon skin not meet the dominant standard. The lighting in the room of sorting and grading of cinnamon skin according to standards that have been established, which should be higher than 100 lux [18] and the highest noise level at 78.4 dBA and the lowest noise level at 48.8 dBA. This indicates that the noise level normal and can be categorized as a safe without protective [18]. With this research, the company is given the big picture or as kind of internal evaluation about the best steps to improve the work productivity in sorting and grading department in the future. Determination coefficient 73.8 % and 26.2 % influenced by other factors besides work motivation, working environment, salary, age and workload. So it is advised to continue research to find that other factors that never been investigated before.

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