

## **WORKLOAD ANALYSIS FOR PLANNING NEEDS OF EMPLOYEES IN THE CORPORATE ADMINISTRATION UNIT PT TIMAH (Persero) TBK**

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*Abstract—PT Timah (Persero) Tbk is a leading exporter of tin as well as the largest mining company in the world. As the industry competition is so tight, the company seeks to strengthen its business strategy of the company's long plan (2013-2017) that is doing the tin mining efficient and environmentally friendly in order to achieve profitability. One preparation to achieve the strategic HR planning that is ripe with a set amount of human resources that ideal. The final project is focused on employee workload measurement with observations using the method of work sampling observations made at intervals of several employees in the work unit Corporate Administration. Each employee was asked to fill in diary form sampling with principal activities, events and activities inhibitor leeway on work time. Workload information will be used to calculate the amount of the administrative needs of the employees of the Company. Workload information can also be used to predict future employee needs. Based on these calculations in this year, this data will be used to predict how much the number of employees needed for each job for next year. Number of employees in accordance with the workload will support the needs of employees in strategic planning unit in particular Corporate Administration and PT Timah (Persero) Tbk in general.*

*Keywords : Planning Needs of Employees, Workload, Work Sampling.*

### **1. Introduction**

PT Timah (Persero) Tbk is a leading exporter of tin as well as the largest mining company in the world. As the competition is so tight, a strategy to execute the company's long-term plan (2013-2017) that conduct mining with efficient and environmentally friendly way to achieve profitability. One strategy is human resource planning by setting the number of mature human ideal.

HR managers of companies should plan human resources to predict the ideal number of employees needs. Recruitment needs and outcomes that do not fit between the target and its realization will produce inefficient for the company. Employee needs can be met, but can not be predicted in advance by your HR. The planning process is not mature employee raises a number of employees in the unit mark / work unit specific. As well as employees in the work force totaled 66 Company Administration employees.

Figure 1 below shows one of the tools needed to be able to determine the number of employees in each unit needs work is the information about the workload of each employee in each work unit of the company. Workload information of employees is one of the important inputs in determining the areas of HR policies, especially for Employee Needs Planning.



Figure 1. Workforce Planning and Workload

Workload is an important factor for determining HRM policies in the system, for example, the planning needs of employees. Workload terminology refers to the time parameter. This means that the percentage of working time effective use by employees (Niebel, 1999). Workload not only calculate the time spent for productive work but includes calculating the human aspects, such as fatigue, personal needs, and looseness factor (Barnes, 1989).

## 2. Research Methodology

In this research, we used work sampling. Work Sampling is a method to measure and record activities randomly with specific time interval. Definition of work sampling contains 2 meanings (Gustomo et.al, 2006) :

1. Choosing a job holder as sample

If there is a few of job holder, then data will be valid if all of the job holder can be observed. If it is impossible then a few incumbents will be taken as a representative sample of office for entire population.

2. Select time interval for observation

Observations are carried out based on the determination of the time interval. But maximum number of observations is usually not more than two thirds of total observation time.

Workload output demonstrates workload for a year. In practice, it is impossible to observe activities more than one year of work. So the workload that will be generated from observational data must be converted to one year workload by using a load factor rating. One year workload output will result in the respondent workload measurement standard. This workload is used to calculate the ideal number of employees. Based on this calculation, the data can be used to predict how many of the needs of employees in the future.

### 2.1. Diary Sampling Method

This study used a sampling method called diary sampling, in which respondents are given credence to fill sampling observation at the time of observation. This observation was undertaken during working hours with each observation interval of 15 (fifteen) minutes. It took 8 (eight) hours of work at the time and held for ten (10) days on each of jobs.

The observed activities in the study were grouped according to categories of activities. Grouping activity is described as follows (Gustomo et.al, 2006) :

1. Principal activity is all activities relating to the completion of administrative unit tasks as found in the job description in each basic task in Administrative unit.
2. Inhibitory activity is activity that makes principal activity is delayed due to several factors such as waiting for the absence / lack of equipment / work facilities or waiting for completion of colleague,etc.
3. Leniency activity is not related to the principal activity of employees and is usually done to eliminate fatigue. Then observations were recorded in work sampling form.

Population in this study is employees who work in the field of Corporate Secretariat & Household and field Facilities & Administrative Building on the work unit of the Company. Samples in this study were drawn from all the principal activities performed by employees who work on the unit.

## 2.2. Data Collection

Of the total population of 66 employees, 19 employees were taken for the calculation of the workload. Workload analysis conducted on the 19 employees with different echelon. Work sampling is done for two weeks or ten days with a 15-minute observation interval. This observation results in the form of a percentage of labor productivity is the percentage of the number of hours worked on the main tally the total tally on work sampling. Moreover tally also calculated looseness activity and inhibiting activity. Bringing the total tally to 30 tally. Working hours except on Fridays by 28 tally. After getting the data in the form of a tally of all 3 activities, then the data is processed by using the Workload analysis software. The result is workload for one year.

### 2.2.1. Statistical Test

Before continuing to obtain scale computation workload, data on work sampling should be statistically tested. In work sampling method, there are two types of statistical tests, homogeneity test and adequacy test of data. Homogeneity test data is done by looking at variation in data by using upper and lower control limits. If there is data found out of upper or lower control limits, then those data is not used in calculation of workload. While testing data adequacy is done by calculating the amount of data by using a significant level of 10% and a confidence level of 90%. Data is said to be sufficient if the number of data (N) is less than tally total in ten days (10 x 30 = 300 tallies). Formulation for statistical test as follows:

#### 1. Homogeneity Test

$$UCL = p + 3 \sqrt{\frac{p(1-p)}{30}}$$

$$LCL = p - 3 \sqrt{\frac{p(1-p)}{30}}$$

UCL= upper control limit

LCL = lower control limit

$p$  = % productive average

#### 2. Sufficient Test

$$N = \frac{400(1 - \bar{P})}{\bar{P}}$$

N : Number of data

$\bar{P}$  : Average labor productivity in 2 weeks

From the result of homogeneity and data adequacy test, there were only 17 data that can be used to further analysis of workload.

**2.2.2. Workload Calculation**

The next stage of workload calculation is as follows:

- a. Calculation of average labor productivity in 10 days

Formulation :



- b. Workload for 2 weeks

For workload for 2 weeks is calculated by multiplying the average adjustment factor productivity with the incumbent.

Formulation:

$$BK_n[2 \text{ MINGGU}] = p \times r$$

with:

BK<sub>n</sub> = normal workload

*p* = % productive average

*r* = rating factor

- b. Workload for 1 month

Computation workload for one month can not be separated from the distribution of the daily work activities. There are three categories of daily busyness levels, namely low, average and high.

Formulation :

$$BK_n [1 \text{ BULAN}] =$$

$$BK_n[2 \text{ MINGGU}] \times \{ (k_1 \times a) + (k_2 \times b) + (k_3 \times c) \}$$

with:

k<sub>1</sub> = conversion factor for daily high load

k<sub>2</sub> = conversion factor for daily avg load

k<sub>3</sub> = conversion factor for daily low load

a = percent of high load in one month

b = percent of avg load in one month

c = percent of low load in one month

Setting values of k, a, b, and c obtained based on the results of interviews with the top.

Observed data taken from April 13th 2013 to 1 April 2013 so that for the first, seventh, tenth, and fourteenth employees were observed at a high level of daily activity, while the others are categorized as average. Comparison of low, average, and high activity is 1: 2: 2 so the conversion factor to be 0.5: 1: 1. All parameter values above was determined by researcher through conducting interview with head of Corporate Administration. Here is level of daily activity employees:

Table 1. The Daily Bustle Activity

Category of bustle rate	The number of days	
	Employee Group 1*	Employee Group 2*
High	230	122
Average	0	46
Low	0	62
Total	230	230

\*Remarks:

Group 1: The level of daily activity of sample 1, 7, 10, and 14.

Group 2: The level of daily activity of sample 2, 3, 4, 5, 6, 8, 9, 11, 12, 13, 17, 18, and 19.

c. Workload for 1 year

Formulation:

$$BK_n [1 \text{ TAHUN}] = BK_n [1 \text{ BULAN}] \times \{ (k_4 \times q) + (k_5 \times r) + (k_6 \times s) \}$$

with:

k<sub>4</sub> = conversion factor for monthly high load

k<sub>5</sub> = conversion factor for monthly avg load

k<sub>6</sub> = conversion factor for monthly low load

p = percent of high load in one year

q = percent of avg load in one year

r = percent of low load in one year

Setting values of k, p, q, and r obtained based on the results of interviews with the top.

Calculation of workload for 1 year, to be considered is level of monthly activity. The data taken in April of that level of activity for sample of 1,7, and 10 and 14 are at a high level of monthly activity, while other employees were observed at low level of monthly activity. All parameter values above was determined by researcher through conducting interview with head of Corporate Administration. Here is the distribution level of monthly activity in administrative units.

Table 2. Monthly Rate Bustle

Month	Bustle level Group 1*			Bustle level Group 2*		
	Low	Average	High	Low	Average	High
January			1		1	
February			1		1	
March			1		1	
April			1	1		
May			1	1		
June			1			1
July			1			1
August			1			1
September			1			1
October			1		1	
November			1			1
Desember			1			1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>2</b>	<b>4</b>	<b>6</b>

Description:

Group 1: The level of monthly activity of sample 1,7,10, and 14.

Group 2: The level of monthly activity of sample 2, 3, 4, 5, 6, 8, 9, 11, 12, 13, 17, 18, and 19.

e. Standard workload for 1 year

Standard workload for 1 year involve leniency factor. This factor is calculated from the percentage of private activities that are not related to the principal activity of the employee and is usually done to eliminate fatigue.

Formulation:

$$BK_i [1 \text{ TAHUN}] = BK_n [1\text{TAHUN}] \times (1 + L)$$

with:

$BK_i$  = workload/ year for employee- $i$

$L$  = allowances factor

After going through the stages of data collection and perform calculations using the formula - the formula above, then the calculation of labor productivity and workload standards for 1 year as shown in **Table 3** below:

Table 3. Productivity and Corporate Administration Employee Expenses

Sample	Workload 2 Weeks	Workload 1 Year
1	88,67%	78,03%
2	80,33%	117,91%
3	42,67%	62,22%
4	59,67%	84,80%
5	75,00%	98,27%
6	46,67%	60,40%
7	54,67%	58,17%
8	60,00%	68,91%
9	47,33%	63,22%
10	25,67%	25,31%
11	75,00%	98,82%
12	60,00%	68,91%
13	77,00%	82,57%
14	38,67%	35,96%
17	46,67%	60,40%
18	38,67%	57,04%
19	77,00%	82,57%
<b>Average</b>	<b>58,45%</b>	<b>70,79%</b>

From the table above, it can be seen that average level of labor productivity in administrative unit is in interval 25.67% to 88.67%. Considerable range between the average productivity of labor productivity show high differences between employees. There is not much different from average level of labor productivity, workload standard in a year is in interval 25.31% to 117.91%. This result shows unequal workload.

By calculating average standard workload for one year will get the amount of workload (position) in Administrative unit. From the calculation, obtained an average workload of administrative unit is 70.79%. This means that the mean workload for administrative jobs PT Timah is as big as 70.79%.

### 2.2.3. Calculation of Optimal Number of Emploeyss

The requirement to determine the number of employees, there is a value of t to be determined first. Factors to consider are the cost-benefit ratio calculation between adding or not adding employees. 't' value of PT Timah (Persero) Tbk is set at 1,17.

Based on calculation workload above, the next step is to calculate optimal number of employees in Administrative unit.

The formula of employees as follows :

$$J_i = \text{ROUNDUP}[(J_0 \times BK) / t]$$

dengan:

**$J_0$  : the number of people in administrative unit: 66**

**BK : Workload (70, 79%)**

**t : 1,17**

From the result, there are 40 optimal employees in administrative unit. It means that the number of employees in the administrative unit is needed only 40 not 66 people. Thus, the efficiency needs to be done by reducing the number of employees.

### 2.2.4. Prediction Emploeyss Needs

In addition to calculation of optimal number of employees, workload, and number of employees can optimally be variable in calculation of predicted future needs of employees. So planning for the needs of the number of employees in the future can be calculated with this formula:

$$J_i = J_0 \times BK_0 \times K_i$$

with:

$J_0$  : Number of employees at year-to-0

$BK_0$  : The workload in year 0 (by 70.79%)

$K_i$  : the conversion factor of the i-th

So the employee needs for the coming year (2014) are :

$$J_i = 66 \times 70,79\% \times K_i$$

$$J_i = \text{ROUNDUP} (66 \times 70,79\% \times 1) = 47$$

The conversion of workload is 1 in 2014. The number of employees obtained in 2014 in Corporate Administration are 47 employees. The number of employees is still small compared with the number of employees in 2013 (66 employees). Thus, for 2014, is not necessary to open recruitment for the Corporate Administration.

## 3. Conclusion

The initial step in support of the company to carry out human resource planning properly is to

determine the needs of employees. The method to determine the number of employees in this study is work sampling. Based on research conducted in administrative unit can be summarized as follows:

1. Average workload in administrative unit is 70.79%. This means that the workload in administrative unit of PT Timah Tbk is 70.79%.
2. Of the workload factor, this result obtained the optimal number of employees in a working unit only 40 administrative employees. It means that the number of employees in the administrative unit is needed only 40 not 66 people. Thus, the efficiency needs to be done by reducing the number of employees.
3. Reduction of employees in Corporate Administrative can be done by not extending the contract labor in the Corporate Administrative.

The number of employees in administrative unit in 2014 is 47. The number of employees is still small compared with the number of employees in 2013 (66 employees). Thus, for 2014, it is not necessary to open recruitment for the administrative unit. Measurement of employee workload is a planning instrument that is based on the calculation of the real needs and acceptable to all parties, both short-term and planning year - next year.

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