

# Improving Man Power Productivity Using Work Load Analysis in PT. Abadi Surya

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## ABSTRAK

Riset yang dilakukan bertujuan untuk mengukur beban kerja karyawan di PT. Abadi Surya terutama Divisi HCGS (Human Capital and General Services) serta menentukan tenaga kerja yang dibutuhkan setiap posisi. Berdasarkan observasi awal, terdapat beban kerja yang tidak seimbang di antara karyawan sehingga berakibat tidak produktivitas nya kerja. Untuk itu, analisa beban kerja dilakuka untuk mengukur beban kerja yang pantas untuk setiap posisi bersangkutan. Dalam meningkatkan produktivitas karyawan dapat dilakukan dengan analisa produktivitas berupa pengukuran beban kerja dari karyawan dan standarisasi *Full Time Equivalent* (FTE). Sampel dari penelitian ini adalah 17 posisi di Divisi HCGS dan karyawan ahli terpilih sebagai narasumber. FTE karyawan dibandingkan dengan FTE perusahaan atau waktu yang tersedia, dan analisa *gap* di kalsifikasinya dalam indeks FTE. Beban kerja yang tidak seimbang dapat diminimalisasi dengan perhitungan rencana beban kerja di setiap posisi. Beberapa alternatif strategi rencana beban kerja tersedia dalam perbandingan keunggulan dan kelemahan di setiap strategi. Hasil dari penelitian ini memberikan rekomendasi yang jelas kepada PT. Abadi Surya dalam memlilih strategi yang tepat dalam mengurangi beban kerja yang tidak seimbang.

**Keywords:** *Karyawan, Produktivitas, Analisa Beban Kerja, Full Time Equivalent, Analisa Gap, Rencana Tenaga Kerja.*

## ABSTRACT

The research is accomplished by measuring the workload of officers of HCGS Division in PT HGS. This measurement will be used for determining the man power required by each position. Based on initial observation, there is imbalance workload distribution among the employees leads to the low employee productivity. Therefore, the workload analysis is needed to find the appropriate workload allocation among employees. The productivity is analyzed by measuring work load and Full Time Equivalent (FTE) standardization using 17 positions of HCGS Division and the expert officer as sample. The employee FTE is compared to the company's FTE and gap analysis is done. Gap will be classified using FTE Index. Next, the unbalance workload will be minimized by determining the man power of each position. Several alternatives of man power planning are provided by analyzing the advantages and disadvantages of each alternative. The result of this study is to provide the best strategy for reducing the unbalance of workload.

**Keywords:** *Officer, Productivity, Workload Analysis, Full Time Equivalent, Gap Analysis, Man Power Planning.*

## 1. Introduction

The term of productivity measurement has examined in various term of study including Economics, Management, Human Resource Management, and Industrial Engineering. Industrial Engineers have always associated with productivity since 1800s and are expected to reduce the use of resources while increasing the outputs (Phusavat, 2013). Productivity definition might be different based on the aspects or studies point of view. Based on ONS Productivity Handbook (2007), the first definition of productivity is about the ability to produce outputs (goods or services) in taking consideration to the amount of inputs (raw material, capital and labor) used to produce them. The main point of productivity is the comparison (ratio) between output and input. Later, this term is being used to formulate the productivity.

Based on the report of Harvard Business Reviews Analytic Services (2013), companies have been increasingly monitoring the human productivity as the important factor to obtain the company's goals and reduce costs, such as turnover. In addition, the research stated that employee

engagement has significantly influence the performance that will have impact to the productivity. About 71% of respondents rank employee engagement as very important to achieving overall organization success.

For measuring productivity especially in the group and individual levels, there are diverse concepts and. According to Zigon (1998), those concepts are motivational approach by industrial psychologists, appraisals for salary structure/job assignments/workload analysis by human resource specialists, and piece rate and standard times by industrial engineers (as cited in Phusavat, 2013, p. 38).

PT. XYZ believes that productivity will influence the profit of the company. By measuring the productivity, the company is able to identify whether one position is productive, overload or under load. Thus, it is needed to conduct a research for developing a strategy of man power productivity in HCGS Division. This research aims to measure the productivity of each position (officer level) in HCGS Division and categorized it based on the workload level. At first, the analysis of job description is needed as the reference of the work load and FTE Standardization. Deeper analysis later will help the company to determine the Man Power Planning (MPP). According to Pradeesh (2011), man power planning or human resource planning aims to allocate the right number of employees (man power) with the right skills, experience, and competencies in the right position (job) and at minimum cost. Based on several employees that have been observed and interviewed before the project, over load and under load work have been found, on the other word, there are positions that have unbalance workload. Later, the unbalance workload will decrease the working productivity of employee.

## 2. Research Methods

### 2.1 Initial Observation

The initial observation is done by interviewing several officers on certain position and finding the imbalance workload based on company's working time. The officer is selected based on his/her experience on that position and being measured as the expert judgement. The result of initial observation then will be clarified to his/her supervisor to validate the measurement.

### 2.2 Problem Identification

Problems are identified started from generating the job description for position in HCGS Division. Workload is not distributed equally compared to the actual working period given by company that will significantly affect to the productivity. Some position has over load working load, others have under load. The measurement of the productivity is conducted by interview to the officer. The main objective is to measure the current productivity of HCGS position by Work Load Analysis and FTE Standardization, later the analysis can be used to determine the Man Power required for certain position.

Full Time Equivalent (FTE) is representing the number of working hours of one full-time employee during a fixed time period consider as one month or one year (Tracy, 2015). FTE calculation derives into two parts, which are FTE of the company and FTE of the employee. FTE of the company is determining how many hours of work that the employees have (the availability time) and FTE of the employee is determining how many hours one full time employee works. The total workload hours are divided by the working hours of one employee. This results in the number of full time equivalents that are needed.

$$\text{FTE of employee} = \frac{\text{Workload hours}}{\text{FTE of company}} \quad (1)$$

Workload hour of an activity is determined by how frequent the activity is done in a year (period) and in each period (frequency), how many times the activity is done per unit frequency (quantity or volume), and how long it takes for completing the activity for each unit quantity (process time).

$$\text{Workload hours} = \text{period} \times \text{frequency} \times \text{quantity} \times \text{process time} \quad (2)$$

The available working hour or FTE of the company is determined by considering working days, off days, standby, and allowances that an employee has in one year working time. The formula is written as Equation 3 as follow.

$$\text{FTE of company} = (365 - \text{off days} - \text{standby days} - \text{allowance}) \times \text{number of working hours per day} \quad (3)$$

The FTE of employee becomes:

$$\text{FTE of employee} = \frac{\text{period} \times \text{frequency} \times \text{quantity} \times \text{process time}}{(365 - \text{off days} - \text{standby days} - \text{allowance}) \times \text{number of working hours per day}} \quad (4)$$

The result of employee FTE calculation can be categorized into three types which are called as FTE index. These types are High, Medium, and Low. FTE index determines by the company's policy and consider as the ideal and valid. The details of FTE index types are shown in Table 1.

Table 1. FTE Index

Index	Definition
0.9 - 1 FTE	High
0.75 - 0.89 FTE	Medium
0.6 - 0.74 FTE	Low

### 2.3 Data Collection

Data are collected to support the analysis of productivity includes parameter and measurement assumption, process and activity, as well as frequency, quantity, and process time of doing each position. Parameters and measurement assumption related to the working period of employees in PT. ABADI SURYA set by the calendar of company adjusted to the national calendar. Processes and activities of the employees are shown in details along with the job description. Thus, the employees who are being analyzed are assumed to be the object of the productivity analysis. The processes are conducted through interview with the related employees. The period, frequency, quantity, and process time data are collected through interview as well. Data collected includes how often the activities are done (frequency), how many items or objects are covered in each period (quantity), and how much time the employees spend in doing the activity (process time). The collected data are being included to the productivity calculation.

### 2.4 Data Analysis

As the project target is to determine the man power required in HCGS Division, selection of the position to be analyzed is done. Selection is also done based on the roles of the positions in the division which is officer level because at the higher level, it requires only one man power. Productivity analysis in the project uses a workload analysis and FTE method. FTE that set by the company which is the effective working hours per unit period. Furthermore, productivity calculation for each employee is done to have the output and categorized to the workload, later the non-productive position will be improved by the man power determination. Before the determination of the position workload, the FTE Comparison should be done by referring to the FTE of the company. Next, there will be a gap and this analysis will be used to recommend about the man power required to certain position. After the FTE Comparison is done, the Man Power Planning Analysis is conducted by calculating the employee requirement for certain position. The alternative strategy is whether to hire new employee or transfer employee to other position, called mutation. The strategies are also provided to give a best solution of the man power planning.

## 3. Result and Discussion

### 3.1 Productivity Analysis

The available working time set by company consists of total day in a year, off days, and standby time. The parameters and assumptions are valid only to the Head Office because there are some different working times in the Job Site (other district or company location). Table 2 shows the calculation of company's FTE.

**Table 2. Company's FTE**

Parameter	Indicator	Quantity
Total days	Day of calendar	365
Off day	Weekend	104
	National Holiday	12
	Mass Leave	3
	Personal Leave	9
Standby	Training	5
Total days - Off day		232
Working hour/day		8
<b>FTE (hour/year)</b>		<b>1,856</b>

According to Cudney (2009), allowance is the significant factor to determine working condition. The allowance may refer to the time wasted by the employee to do other activity besides his/her job. Based on company's policy, the allowance for Energy Consumed is neglected (6%), the allowance or working manner is sit (1%), and the allowance for eyestrain is staring (7.5%). The total allowance is 14.5% from the effective working time. This total allowance is being used in the calculation of Full Time Equivalent.

The calculation and analysis of workload of each position is done based on collected data and company's FTE as well. It covers the productivity index including the FTE of employee on each position. There will be various type of FTE index can be found on each position. Based on Formula 5, the employee's FTE can be counted based on company's FTE.

Table 3 shows the significant changes in total hours because of allowance time about 14.5%. The position of Organization Strategic Management has total hours about 2,998.3867 hours/year plus 434.7660 (allowance time). So, the total hours per year become 3,433.1527 hours/year.

**Table 3. Allowance Time of Total Hours**

Department	Position	Total hours/year	Allowance = 14.5% (hours/year)
OD	Organization Strategic Mgt	2,998.3867	3,433.1527
	Culture & Knowledge Mgt	1,895.9933	2,170.9123
	Recruitment and Selection	2,510.7333	2,874.7896
	Recruitment Data Evaluator officer	5,339.1833	6,113.3649
HCD	Human Strategic Mgt	4,647.5900	5,321.4905
	Human Capital Optimization	3,017.5200	3,455.0604
	HCD Data Mgt	261.5316	299.4537
HCS	Compensation & Benefit Analyst	1,372.3750	1,571.3693
	Employee Cost Control	1,447.0967	1,656.9256
	Payroll	1,928.6933	2,208.3538
	Employee Welfare	4,763.5555	5,454.2710
	HCS System Development	4,640.5500	5,313.4297
	Personnel Data	4,638.0041	5,310.5147
IR	Communication & Advocacy Officer	691.7400	792.0423
	Compliance & System Dev. Officer	2128.938333	2,437.6343
CSR	CSR Development Officer	2,157.9600	2,470.8642
	CSR Stakeholder Officer	2,203.4567	2,522.9578

### 3.2 FTE Standardization

The workload of each position is shown in Table 4. Among 17 positions, 11 positions have High workload, 3 positions have Medium workload, and 3 positions have Low workload. FTE Total Position column is the total working time (plus allowance) divided by the Company's FTE (1,856 hours/year). The result of Individual FTE is being categorized based on FTE Index.

**Table 4. Workload Status of Each Employee**

Dept.	Position	FTE Total Position	Man Power Existing	Individual FTE	Workload
OD	Organization Strategic Mgt	1.8498	2	0.9249	High
	Culture & Knowledge Mgt	1.1697	1	1.1697	High
	Recruitment and Selection	1.5489	2	0.7745	Medium
	Recruitment Data Evaluator officer	3.2938	2	1.6469	High
HCD	Human Strategic Mgt	2.8672	2	1.4336	High
	Human Capital Optimization	1.8616	2	0.9308	High
	HCD Data Mgt	0.1613	1	0.1613	Low
HCS	Compensation & Benefit Analyst	0.8466	1	0.8466	Medium
	Employee Cost Control	0.8927	1	0.8927	Medium
	Payroll	1.1898	2	0.5949	Low
	Employee Welfare	2.9387	2	1.4694	High
	HCS System Development	2.8628	2	1.4314	High
	Personnel Data	2.8613	2	1.4306	High
IR	Communication & Advocacy Officer	0.4267	1	0.4267	Low
	Compliance & System Dev. Officer	1.3134	1	1.3134	High
CSR	CSR Development Officer	1.3313	1	1.3313	High

### 3.3 Man Power Planning

Man Power Planning is necessary for the company to determine the number of employee should be hired to do the certain job based on position. FTE Standardization and Workload Analysis are useful to determine the man power required. The High workload (FTE >1) means there is more than one employee should be hired to cover all the jobs in one year.

Table 5 shows the man power planning of each position based on its FTE. In order to fulfill the task list and job of each position, the FTE position should be rounded up and the result is shown in Man Power Required column. The Man Power Required is being compared to the existing man power and it showed the gap between both of them. The Remain column is additional man power required for each position. Thus, there are 9 positions which requires additional personnel, such as culture & knowledge management, recruitment data evaluator, etc.

**Table 5. Man Power Planning**

Dept.	Position	FTE Total Position	Man Power Required	Man Power Existing	Remain
OD	Organization Strategic Mgt	1.8498	2	2	0
	Culture & Knowledge Mgt	1.1697	2	1	1
	Recruitment and Selection	1.5489	2	2	0
	Recruitment Data Evaluator	3.2938	4	2	2
HCD	Human Strategic Mgt	2.8672	3	2	1
	Human Capital Optimization	1.8616	2	2	0
	HCD Data Mgt	0.1613	1	1	0

**Table 5. Man Power Planning (cont'd)**

Dept.	Position	FTE Total Position	Man Power Required	Man Power Existing	Remain
HCS	Compensation & Benefit Analyst	0.8466	1	1	0
	Employee Cost Control	0.8927	1	1	0
	Payroll	1.1898	2	2	0
	Employee Welfare	2.9387	3	2	1
	HCS System Development	2.8628	3	2	1
	Personnel Data	2.8613	3	2	1
IR	Communication & Advocacy	0.4267	1	1	0
	Compliance & System Dev.	1.3134	2	1	1
CSR	CSR Development Officer	1.3313	2	1	1
	CSR Stakeholder Officer	1.3594	2	1	1

There are four alternatives that could be the recommendation for the company to minimizing the gap in order to decide the number of man power in certain position. Those alternatives are: Direct Recruit, Officer Support, Administrator Support, and Hybrid. Direct Recruit means the demand or needs of all positions are being covered by recruiting the employee based on needs. Officer Support means there are several jobs that can be covered by others officer as long as the job is related with others officer; usually, the support from officer can be done because of those positions are in the same section. Administrator Support means the position is being helped by administrator. Hybrid is the combination of officer support and administrator support; the job is covered by other officers and admin. Table 6 shows the alternatives' advantages and disadvantages that can be used as the subjective factor of decision making.

The alternatives are being compared based on Man Power Required, Man Power Existing, Current Administrator, Additional Administrator Required, and Additional Officer Required. Based on Table 8, the feasible alternative is Hybrid. Adding new employee is considered as cost and takes a long time rather than administrator. Also, by considering the additional officer required, the Officer Support Alternative required 8 officers and Hybrid Alternative required 5 officers. Thus, the Hybrid alternative is the best one due to the least amount of Man Power required. The Hybrid Alternative required 5 additional officers and 0 administrators.

**Table 6. Comparison of Man Power Analysis**

No.	Alternatives	Advantages	Disadvantages
1	Direct Recruit	1. The job is done easily and there is no High workload 2. The officers are focus in doing their job based on their job description	1. Costly 2. Need more time to recruit all officers
2	Officer Support	1. The job is done faster 2. No need to recruit more officer	1. The officers are not focus in doing job 2. The SOP might be confusing
3	Administrator Support	1. Certain task might be done faster 2. Less cost than recruit the officer	1. The result of job might be not good 2. Need training
4	Hybrid	1. The job is done faster 2. No need to recruit more officer 3. Less cost	1. The officers are not focus in doing job 2. The SOP might be confusing

**Table 7. Alternatives Summary**

Alternative	Man Power Required	Man Power Existing	Current Admin	Add. Admin Required	Add. Officer Required
Direct Recruit	36	26	N/A	N/A	10
Officer Support	34	26	N/A	N/A	8
Admin Support	36	26	4	1	6
Hybrid	35	26	4	0	5

#### 4. Conclusion

The Full Time Equivalent (FTE) of each position is determined by interviewing all positions of officer level. By comparing the FTE gap and the number of man power existed, the workload has been determined. The workload of each position has been standardized based on its man power. The Man Power Planning analysis has been done in considering the fulfilment of FTE gap in order to do the job in one year period. There are four alternatives as the suggestion to the company in order to cover the job of each position. The Hybrid Alternative has been chosen as the feasible one considering the cost as well as the job description.

Based on the analysis, several recommendations can be obtained. The method of collecting data should be improved not only the officer judgement. Although the data is checked and verified by the Section Head (superior of officer), the data might be more accurate if the company has the standard to record the job description of all positions based on PT. Abadi Surya policy. Furthermore, the further study might be done by determining the cost and impact of recruiting employee based on man power planning analysis. The scope of this study is only determining the appropriate number of employee that can cover the job of each position. However, the recruiting process is not as simple as recruiting based on demands. The man power planning can be examined deeply by analyzing the needs of each position and the impact after recruiting new employee.

**Table 8.** Allowance Determination

No.	Factor	Working Activity	Allowance (%)		
			Weight Eqv.	Men	Women
<b>A. Energy Consumed</b>					
1	Neglected	Behind the Table, sit	No Weight	0 - 6	0 - 6
2	Very Light	Behind the Table, standing	0 - 2.25 kg	6 - 7.5	6 - 7.5
3	Light	Shovel, light	2.25 - 9 kg	7.5 - 12	7.5 - 16
4	Moderate	hoe	9 - 18 kg	12 - 19	16 - 30
5	High	hammer, heavy	19 - 27 kg	19 - 30	
6	Very High	Shouldering, heavy	27 - 50 kg		
7	Extremely High	Shouldering, very heavy	> 50 kg		
<b>B. Working Manner</b>					
1	Sit	Sit, Light	0 - 1		
2	Standing on both feet	Body upright	1 - 2.5		
3	Standing on one foot	One foot working on eqp.	2.5 - 4		
4	Lie Down	On side, back, or front of body	2.5 - 4		
5	Bend Over	lie on both feet	4 - 10		
<b>C. Eyestrain</b>			Good Exposure	Bad Exposure	
1	Changes outlook	Carry on tools	0 - 6	0 - 6	
2	Staring	High accuracy	6 - 7.5	6 - 7.5	
3	Staring and changes focus	Checking on the defect product	7.5 - 12	7.5 - 16	
4	Staring and stable focus	Checking with high accuracy	12 - 19	16 - 30	
5	Staring with high concentration and stable focus		19 - 30		
6	Staring with high concentration and changes focus		30 - 50		

**Table 9. FTE Sample Calculation**

	Major Process	Task	Period	Freq.	Qty	Process Time (min)	Total hours/year	FTE
	<b>Position Organization Strategic Mgt</b>	<b>Organization Management</b>	1	Yearly	1	40	120	80
2			Yearly	1	70	60	70	0.037715517
3			Yearly	12	50	60	600	0.323275862
4			Monthly	4	5	5	12.88	0.006941451
5			Yearly	1	210	60	210	0.113146552
6			Yearly	1	335	120	670	0.360991379
7			Yearly	3	1	180	9	0.004849138
8			Yearly	1	1	180	3	0.001616379
9			Daily	2	1	30	232	0.125

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