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Analysis of Employees of Outsourcing Companies Using SWAT (Subjective Workload Assessment Technique) and CVL (Cardiovascular Load) Methods

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Abstract

A company certainly has an important role for employees in it, this role can determine the success or failure of a company. However, behind the important role of employees, there are also several obstacles, such as the workload of employees. Workload is the difference between a worker's abilities and job requirements. Someone will definitely feel a small, medium and large workload when carrying out activities in a company. Activities carried out by a person can be divided into two categories, namely physical activities and spiritual activities. These two things cannot be separated from each other, but can be distinguished by looking at the dominant activity. In conclusion, this study focuses on the workload experienced by employees of Outsourcing Companies. The purpose of this study is to analyze the workload of each employee at the Outsourcing Company and provide recommendations for corrective actions needed based on the measurement of workload, this study also uses two methods including the SWAT method and the CVL method. includes time 49.91%, effort 23.56%, and stress 26.56%, so that the dimension that has the greatest influence on the workload of employees is the dimension of time. Meanwhile, the CVL method revealed that the 15 employees who felt the highest workload were 31.304%. This research resulted in several suggestions for improvement, namely adding new employees and providing nutritious snacks for employees.

I. Introduction

With the times, the industrial world is also developing and undergoing very rapid changes. The need for Human Resources (HR) of a company will greatly affect the competition between companies. Human Resources contained in a company has various types of work, each according to their abilities and desires. Workload is the difference between the ability of workers and the demands of the job (Hancock, 1988). When carrying out activities in a company, someone certainly feels the workload on a small, medium, to large scale. Activities carried out by a person can be divided into two groups, namely activities related to the physical (muscle) and activities related to mental (brain). These two things cannot be separated from each other, but can be distinguished by looking at the activities that dominate, whether physically (muscle) or mental (brain). Thus, these two activities create a workload. Human Resources (HR) is the most important component in a company or organization to run the business it does. Organization must have a goal to be achieved by the organizational members (Niati et al., 2021). Development is a change towards improvement. Changes towards improvement require the mobilization of all

Keywords

workload; cardiovascular load; dosbox; stress load; SWAT



human resources and reason to realize what is aspired (Shah et al, 2020). The development of human resources is a process of changing the human resources who belong to an organization, from one situation to another, which is better to prepare a future responsibility in achieving organizational goals (Werdhiastutie et al, 2020).

Company Outsourcing is a leading ready-to-use manpower service provider company that provides a wide range of workers who handle work in various business fields. And according to the company's business development, Outsourcing has also developed its business and other business development plans that also support the ongoing business of outsourcing service providers.

In Outsourcing, there are various types of workloads that some employees complain about, but in this study only focused on 1 workload, namely, fatigue when constantly facing the computer to work. This can cause a decrease in concentration due to monotonous activities. So that it makes employees feel uncomfortable and pressured in doing their jobs. Therefore, adjusting the workload is the most important factor in order to support the productivity level of the company in order to become a better company. The workload and abilities possessed by workers must be balanced so as not to cause gaps which will ultimately affect the decline in work motivation, reduced concentration, selfdissatisfaction, and so on.

From the description above, it is necessary to analyze the right approach and analyze the workload of employees in outsourcing so that they can optimize employee performance. Based on these problems, the researchers applied the SWAT (Subjective Workload Assessment Technique) and CVL (Cardiovascular Load) methods which are expected to assist companies in measuring workloads accurately and can become recommendations for outsourcing and are expected to optimize the workload experienced by each employee, so that they can improve the efficiency of human resources and work productivity.

II. Review of Literature

2.1 Ergonomics

Ergonomics is a branch of applied science to utilize information about human capabilities and limitations to design work systems, so that humans can live and work in a good, effective, and comfortable system. One of the approaches used to design an ergonomic facility system is an anthropometric approach. With this approach, an ergonomic chair design can be obtained that is adjusted to the human body posture, so that a chair that fits the needs, abilities, and limitations of humans when sitting is obtained. The focus of ergonomics is on people and their interactions with products, equipment, facilities, procedures and the environment and workers and everyday life where the emphasis is on the human factor. According to the point of view of ergonomics, task demands and work capacity must always be within the scope of the balance line so that high work performance is achieved. Based on this definition, the focus of ergonomics is humans in the sense that the work system as far as possible is adapted to human nature, abilities, and limitations.

Thus, basically ergonomics is a science that studies various aspects and human characteristics (ability, strengths, limitations, etc.) that are relevant in the work context, and utilizes the information obtained in an effort to design products, machines, tools, environments, and the best work system. The goal is to achieve a productive work system and the best quality of work, accompanied by convenience, comfort, and work efficiency, without neglecting occupational health and safety (Iridiastadi, 2014).

2.2 Workload

Every employee certainly has a workload for their work according to the responsibilities given by the company. Every worker can work in a healthy manner without endangering himself and the community around him, for this reason it is necessary to make efforts to harmonize work capacity, workload and work environment so that optimal work productivity is obtained. Workload needs to be calculated to determine the workload of employees. According to Simanjuntak (2010), the workload is a consequence of the activities given to workers. Worker activities can basically be distinguished between physical activity and mental activity. In daily life, workload is a combination of physical workload factors and human mental workload factors that influence each other, the measurement of workload is very much needed by a company to control workers.

According to (Widyanti et al. 2016) there are two types of workloads, namely mental workload and physical workload. The workload experienced by a worker can be in the form of a physical workload while a mental/psychological workload or a social/moral workload arising from the work environment. A good workload is a workload that is designed in accordance with the abilities and limitations, both physically and mentally.

In general, some experts classify workload measurement methods into 3 categories, namely:

- 1. Subjective measurement (subjective method)
- 2. Psychological and biomechanical measurement (Physiological and biomechanical method).
- 3. Measurement based on performance (performance-based)
 - Some of the benefits of measuring workload provided to organizations, namely:
- Arrangement/improvement of organizational structure
- Assessment of job performance and work performance of units
- Materials for improving work systems and procedures
- Facilities for improving institutional performance
- Setting standard workload positions/ institutional arrangements, preparation
- of employee lists or materials for determining the echelonization of structural positions
- Preparation of plans for real employee needs in accordance with the workload of the organization
- Employee transfer programs from redundant units to units that
- lack
- Employee promotion programs
- Reward and punishment for units or officials
- Materials for improving training programs
- Determination materials policies for leaders in order to improve the utilization of human resources.

There are several practical goals where mental workload can be applied in companies (Tarwaka, 2015):

- 1. To allocate functions and tasks to and from operators based on the predicted workload.
- 2. Compare alternative equipment and task designs in terms of the workloads they affect.
- 3. To select operators who may have higher source capacity to carry out tasks that have a high load impact.

4. Monitor operators of complex equipment and adapt to difficult task or multi-task conditions in response to decreases and increases in mental workload.

2.3 SWAT

The Subjective Workload Assessment Technique (SWAT) method was developed by Gary B. Reid from the Human Engineering Division at Armstrong Laboratory, Ohio-USA. SWAT is used to analyze the workload faced by someone who has to carry out various activities (both physical and mental workloads), in the application of SWAT it will provide a subjective scaling that is simple and easy to do to quantify the workload of various activities. that must be done by a worker (Simanjuntak, 2010). SWAT will also describe the work system as a multi-dimensional model of the workload consisting of three dimensions or factors, namely Time Load (T), Mental Effort (E) , Psychological Pressure Burden (S) (Widiyanti, et al., 2010). Each consists of 3 (three) levels, namely low, medium and high. In its application, each level for the three factors will be combined to form 27 combinations of mental workload levels (Saputra et al., 2014).

In measuring mental workload using the SWAT method, there are several steps that must be taken. The steps in solving SWAT are as follows:

1. Scale development

The scaling stage is used to train subjects on the use of descriptors and is used to obtain data on how these dimensions combine to create each individual's personal impression of the workload (Reid et.al, 1989).).

Sorting of cards is done to achieve three goals. The first is prototyping and determining the use of the type of scale for each respondent through the Coefficient of Concordance control analysis. The second is the Axiom Test which is intended to assess the validity of the additive model of the data, and the third is the Scaling Solution, which is the process of calculating the scale that will be used by each respondent (Saputra, 2015).

- 2. Kendall's Coefficient of Concordance Test
- 3. Axiom Test
- 4. Scaling Solution

Scaling solution is the process of calculating the scale that will be used by each respondent, be it Group Scaling Solution (GSS), Prototyped Scaling Solution (PSS), or Individual Scaling Solution (ISS).

5. Event Scoring

In the assessment stage, an activity or event will be assessed using low (1), moderate (2) and high (3) levels for each dimension or factor. The scale value associated with the previous combination (obtained from the scaling stage) is then used as the workload value for the activity concerned, from this conversion it will be known whether the activities carried out by the respondent are classified as light, medium or heavy (Wignjosoebroto & Zaini, 2007). If the rating value is below 40, then the person's workload is categorized as low. Meanwhile, if the SWAT rating is at a value of 41 to 60, then the workload of the person is at a moderate or moderate level, and if the SWAT rating is 61 to 100, it can be said that the workload is high. The results of the workload that have been known can then be taken the necessary actions or policies to achieve optimal results. At a low level of workload it will not be good for worker performance, as well as at a high level of workload it can be bad, especially for the health of workers (Simanjuntak, 2010).

2.4 CVL method

Increased pulse rate has a very important role in increasing cardiac output from rest to maximum work. Manuaba (2000) determines the classification of workload based on the increase in work pulse compared to the maximum pulse rate due to cardiovascular load (cardiovascular load = % CVL) which is calculated by the following formula:

%CVL = $100 \times (work pulse-rest pulse)$ maximum pulse-rest pulse

Where according to (Tarwaka, 2004) the maximum pulse formula is:

-> Maximum pulse = 220 -

female age -> Maximum pulse rate = 200 - age

Maleclassification as follows:

= no fatigue
= repair is needed
= work in a short time
= immediate action is required
= not allowed to do activities

III. Research Method

In this study, the number of participants or staff in Outsourcing The number of employees is 16 people, most of whom have the same task, namely inputting new employee data, help manage BPJS employees, input licensing data, take care of all tax matters, and calculate absences, wages, deductions, etc.

SWAT (Subjective Workload Assessment Technique) was measured by distributing questionnaires to employees and then processed using Dosbox 0.74 and CVL (Cardiovascular Load) method using an oximeter. Furthermore, it is calculated based on the counting guide from the literature.

3.1 SWAT Data

Collection This data collection is filled with questionnaires for Outsourcing for sorting 27 SWAT cards and job evaluation based on the dimensions of Time (T), Effort (E), Stress (E) with a scale of 1 to 3, Job Description data and Data on the Number of Employees.

3.2 Scale Development

During the scaling phase, data set processing and prototyping are performed for worker workloads. The scaling phase was used to educate the issues involved in the use of descriptors and to collect data on how these dimensions are combined to produce individual impressions of the workload.

3.3 Event Scoring (Workload Assessment)

The ranking results for the maps included in the SWAT program are the results of the scaling of each object used to analyze the phase point events. At this stage, the value of the work done after the employee worked, they were asked to fill out a questionnaire for each task list. The survey results are converted using the Scaling Solution.

3.4 CVL Data Collection

Researchers collect data needed for research or prepare a questionnaire such as working heart rate, resting heart rate, and energy consumption.

3.5 Calculation of Heart Rate and Energy Consumption

This calculation is intended to determine the maximum heart rate of each employee. Where the maximum heart rate differs between men and women. In addition, the measurement results of energy consumption are processed to determine whether the load is heavy or light.

3.6 Calculation of Cardiovascular Load Percentage

Calculate the percentage of cardiovascular load to calculate the cardiovascular burden experienced by workers to determine the classification of light or heavy loads. Energy expenditure is then used to determine the amount of energy for physical work, one way is to compare energy expenditure with heart rate or heart rate.

3.7 Classification % CVL Workload

classification is based on the increase in work pulse rate compared to the maximum pulse rate because the cardiovascular load will be calculated to determine the level of light workload categories.

IV. Result and Discussion

4.1 Presentation of data using the SWAT method

When applying the SWAT method, data collection has two phases, a scaling phase and an event assessment phase. During the scale development phase, SWAT cards are distributed to participants and then ranked from lowest to highest according to the individual's perceived burden. The SWAT card order is listed below.

Table 1. Preparation of Employee SWAT

										1 7						
Card								Seq	uence	e Cards	5					
S	K	Κ	Κ	Κ	Κ	Κ	Κ	Κ	Κ	K1	K1	K1	K1	K1	K1	K1
Card	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
Ν	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
В	3	4	3	2	2	3	2	3	3	7	4	3	4	2	2	7
W	10	9	5	8	3	6	7	9	8	3	3	10	11	8	7	3
F	2	3	2	3	6	2	4	2	2	4	2	2	2	3	4	4
J	7	5	6	5	8	10	13	5	5	9	5	5	6	5	13	9
С	15	16	12	12	4	4	6	12	12	6	7	17	15	10	6	6
Х	9	10	7	9	11	7	3	8	7	12	8	9	9	9	3	12
S	12	13	11	11	5	8	8	11	11	8	9	15	14	11	8	8
Μ	18	22	20	21	9	9	17	18	17	2	10	22	21	14	17	2
U	4	2	4	4	10	5	5	4	4	5	6	4	3	4	5	5
G	6	6	9	7	7	13	11	6	9	10	11	7	7	7	11	10
Ζ	14	17	14	15	12	12	12	14	13	11	12	16	12	13	12	11
V	5	8	8	6	19	11	16	7	6	13	14	6	5	6	16	13
Q	8	7	15	13	21	14	14	17	14	20	13	8	8	18	14	20
ZZ	22	19	19	17	15	15	15	21	16	15	15	20	18	19	15	15
Κ	13	12	13	14	16	21	10	13	15	16	16	12	16	12	10	16
E	21	20	18	16	17	22	9	19	22	17	21	19	20	20	9	17
R	24	25	21	22	14	20	22	23	23	18	17	25	25	25	22	18

Н	11	11	10	10	13	18	18	10	10	14	18	11	10	15	18	14
Р	17	14	16	19	20	16	20	16	19	19	19	14	13	16	20	19
D	20	23	24	25	18	19	26	25	21	21	20	23	23	23	26	21
Y	16	15	17	18	26	17	19	15	18	22	24	13	17	17	19	22
А	23	18	25	20	23	24	23	22	24	23	22	18	19	21	23	23
0	26	26	26	_	24	25	24	26	26	24	23	26	24	24	24	24
L	19	21	22	23	22	23	21	20	20	25	26	21	22	22	21	25
Т	25	24	23	24	25	26	25	24	25	26	25	24	26	26	25	26
Ι	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27

Source: Direct Data Collection Data

4.2 Processing using the SWAT method

Data in table 1 is processed using DosBox 0.74 and the latest SWAT scale value is obtained.

No	Dimens	sions of V	SWAT Rescaled	
INU	Time	Effort	Stress	SWAI Kesculeu
1	1	1	1	0
2	1	1	2	15.1
3	1	1	3	26.5
4	1	2	1	12.9
5	1	2	2	28.1
6	1	2	3	39.5
7	1	3	1	23.6
8	1	3	2	38.7
9	1	3	3	50.1
10	2	1	1	23.0
11	2	1	2	38.1
12	2	1	3	49.5
13	2	2	1	35.9
14	2	2	2	51.1
15	2	2	3	62.5
16	2	3	1	46.6
17	2	3	2	61.7
18	2	3	3	73.1
19	3	1	1	49.9
20	3	1	2	65.0
21	3	1	3	75.9
22	3	2	1	60.0
23	3	2	2	74.0
24	3	2	3	86.8
25	3	3	1	73.2
26	3	3	2	87.2
27	3	3	3	100

Table 2. SWAT Final Scale Value

Source: Direct Data Collection

The results of the Scaling Solution will be the basis for evaluation to determine the value of the Event Scoring. In the next step, the data from the employee workload assessment survey during the data collection phase is transformed using Scaling Solution based on the SWAT scale value., especially maybe for Event Scoring.

Previously, there were several tasks that had to be done by employees to be classified first. The list of jobs created by the Outsourcing, includes:

- 1. Input new employee data
- 2. Help manage BPJS employees
- 3. Calculating absences, wages, deductions, etc.
- 4. Input licensing data
- 5. Handling all tax matters

Employee	No. Job List							
Employee	Ι	II	III	IV	V			
1	49.1	58.8	59.2	35.1	21.1			
2	32.1	45.3	63	47.9	46			
3	46	60	58.8	59.2	32.1			
4	63	46	74	58.8	21.1			
5	35.1	58.8	47.9	58.8	72			
6	75.9	32.1	72	35.1	28.1			
7	46	47.9	59.2	35.1	74			
8	46	21.1	59.2	72	47.9			
9	46	46	46	38.7	72			
10	59.2	45.3	86.8	46	74			
11	58.8	47.9	74	72	59.2			
12	72	58.8	74	58.8	47.9			
13	59.2	59.2	86.8	46	58.8			
14	73.2	58.8	72	59.2	59.2			
15	86.8	72	63	58.8	46			
16	72	58.8	72	46	58.8			

Table 3. SWAT conversion results Employee

If the SWAT conversion value is below 40, the performance is declared low, if the SWAT rating is between 41 and 60, the performance is moderate, and if the SWAT rating is between 61 and 100, the employee's workload is declared high, meaning that the subject at that time could not be assigned the type another job.

	Table	4. Em	ployee	Prototyp	e
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Respondents	TEST	TSE	ETS	EST	SET	STE	SUGGESTED PROTOTYPE
1	0.80	0.81	0.71	0.69	0.74	0.77	Т
2	0.75	0.77	0.72	0.72	0.77	0.78	S
3	0.87	0.88	0.69	0.65	0.68	0.73	Т
4	0.85	0.86	0.69	0.65	0.68	0.73	Т
5	0.93	0, 86	0.6	0.42	0.21	0.32	Т
6	0.94	0.90	0.67	0.53	0.39	0.48	Т
7	0.89	0.91	0.52	0.41	0.48	0.61	Т
8	0.83	0.86	0.68	0.66	0.73	0.78	Т
9	0.87	0.88	0.71	0.66	0.66	0.71	Т
10	0.94	0 88	0.61	0.45	0.28	0.39	Т
11	0.98	0.93	0.65	0.49	0.32	0.43	Т
12	0.73	0.76	0.70	0.72	0.80	0.81	S
13	0.77	0.76	0.76	0.75	0.74	0.74	Т
14	0.89	0.89	0.70	0.64	0.63	0.69	Т
15	0.89	0, 91	0.52	0.41	0.48	0.61	Т
16	0.94	0.88	0.61	0.45	0.28	0.39	Т

The results of the prototype data processing for the dimensions that are the dominant dimensions in determining the value of the workload, according to respondents subjectively. This software also stands out for all sizes:

- Time Load = 49.91%
- Effort Load = 23.56%
- Stress Load = 26.56%

This result shows that the dimension contribution to the highest load value is the time dimension. He said indicators such as time pressure as they work and complete their assignments.

4.3 Measuring and processing data using the CVL method

Data collection was carried out by giving questionnaires filled out by respondents with the help of researchers, the questionnaires included name, age, heart rate measurements before and after work. The table below shows the results of calculating the maximum pulse period.

No.	Name	Age (Years)	Maximum Pulse Rate
1	K1	30	190
2	K2	26	194
3	K3	26	194
4	K4	31	189
5	K5	30	190
6	K6	28	192
7	K7	28	192
8	K8	26	194
9	K9	32	188
10	K10	32	188
11	K11	28	192
12	K12	28	192
13	K13	33	187
14	K14	33	187
15	K15	33	187
16	K16	32	188

Table 5. Calculation of Maximum Pulse

Table 5 shows that employees 2, 3 and 8 have the highest scores, because they are the youngest compared to other employees.

	Table 6. Percentage of Measurement %CVL								
No Name	Resting	Working	% CVI	Information					
	Inallie	Pulse (beats/minute)	Pulse (beats/minute)	70 C V L	mormation				
1	K1	87	100	12,621	No Fatigue Occurs				
2	K2	107	115	9,195	No Fatigue				
3	K3	99	101	2,105	No Fatigue				
4	K4	74	95	18,261	No Fatigue Occurs				
5	K5	84	106	20,755	No Fatigue				
6	K6	84	106	20,370	No Fatigue Occurs				
7	K7	90	106	15,686	No Fatigue				

8	K8	80	108	24,561	No Fatigue
9	K9	84	106	21,154	No Fatigue
10	K10	90	112	22.449	No Fatigue
11	K11	78	106	24,561	No Fatigue
12	K12	86	114	26,415	No Fatigue
13	K13	79	112	30,556	Need Repair
14	K14	82	114	30,476	Need Repair
15	K15	72	108	31,304	Need Repair
16	K16	76	110	30,357	Need Repair

Based on the results of Table 6, it is known that the physical activity with the highest intensity using the Cardiovascular Load (CVL) method is owned by 15 employees with a result of 31.304%. This is due to the age factor which makes it easier for the employee to feel tired and encourages the employee's heart to beat faster.

Based on the results of data processing to measure mental stress with the SWAT method, the value of the compliance coefficient (W) of Kendall employees is 0.8656 in the early stages, especially in the process of developing the development scale. The value of Kendall's Coefficient of Engagement (W) > 0.75 indicates that the agreement index between participants in the preparation of cards is relatively the same and homogeneous and is handled on a group scale. Therefore, data processing in the event scoring phase using the results of a scaling solution for each research question is known as a group scaling solution.

The incident assessment phase is the phase that assesses the respondent's condition in fulfilling his responsibilities as staff. In SWAT, the assessment of this situation still uses indicators T, E, and S. The event assessment is an individual assessment of 16 participants.

According to job evaluation data from the first employee to the 16th employee, the highest level of commitment is 86.8 for the 10th employee with the 3rd activity, the 13th employee with the 3rd activity, and the 15th employee with the 3rd activity. -1, while the lowest workload value is 21.1 for the 1st employee with the 5th activity, the 4th employee with the 5th activity and the 2nd employee with the 2nd activity.

When load values are displayed by Work Activities, there are 12 events for the low load category, 44 events for the medium load and 24 events for the high load category.

Given the average workload, 0 participants considered a low load, 9 participants considered a moderate load, and 7 participants considered a high load.

Table 7. Measurement Results of Employee Workload									
Measurement of workload	Category	Percentage of total employee workload							
	Low	15%							
Activities at work	Medium	55%							
	High	30%							
	Low	0%							
Average Rescale of each respondent	Medium	56%							
	High	44%							

T 11 F 16

Based on the results in Table 7 it is known that the workload results depend on work activities. including, the number for low category workloads for Outsourcing 12 activities or 15%, which means 15% of all activities considered by employees to be of low value and not in accordance with their work, can make employees bored and lose enthusiasm. The number of moderate workloads for Outsourcing 44 activities or 55%, this means that 55%

of all activities are said to be related to their work so that employees can work more optimally. The number of high category workloads for Outsourcing 24 activities or 30%, meaning that there are 30% of all activities that are considered high value by employees and are not in accordance with their work and can cause fatigue.

The results of the measurement of the load are based on the average value of the workload for all participants, while the total workload for 1. The total workload of Outsourcing the low category is 0%, meaning 0% the total average value of the total workload that employees feel is low and not enough with work, which can result in bored employees, low morale. The workload of Outsourcing is 56%, meaning that 56% of the total average workload experienced by an employee is in accordance with his work so that the employee can work more optimally. The total workload for the high category of Outsourcing is 44%, which means that 44% of the total average value of the workload perceived by employees is quality and inadequate work, which can lead to employee turnover.

V. Conclusion

This is based on the results of data processing between Outsourcing, the values obtained for the SWAT method include 49.91%-time load, 23.56% business burden, and 26.56% mental load, so that the Time dimension has the greatest influence on the bulk value. employee workload. In addition, the average value of the workload of employees in the medium category is 9 employees, namely 1, 2, 3, 4, 5, 6, 7, 8, 9, and in the high category as many as 7 employees, namely employees 10, 11, 12, 13, 14, 15, 16. The Cardiovascular Load (CVL) method shows that the highest residual heart rate is 107 beats/minute, while the lowest resting heart rate is 72 beats/minute which means the employee has a fitness level. The low one. The CVL method also shows high levels of fatigue and requires improvement in employees of Mujib, Aris, Anas and Simon, with Anas having the highest level of fatigue. For this reason, the author provides several suggestions for improving the company, including adding new employees and providing nutritious snacks for employees.

References

- Iridiastadi, Hardianto and Yassierli. (2014). "Introduction to Ergonomics". Bandung: Rosda
- Manuaba (2000). Ergonomics, health and safety. Surabaya: Former Widya.
- Niati, D. R., Siregar, Z. M. E., & Prayoga, Y. (2021). The Effect of Training on Work Performance and Career Development: The Role of Motivation as Intervening Variable. Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences, 4(2), 2385–2393. https://doi.org/10.33258/birci.v4i2.1940
- PA & Meshkati, N. (1988). "Human Mental Workload." Elsevier BV Scientific Publishing House: Netherlands.
- Reid, Garry B., Scoot S. Potter, Rein Bressler. (1989). "Subjective Workload Assessment Techniques (SWAT): Manual (U). Harry G. Human Systems Command- Wright Patterson Air Force Base, Ohio-USA.
- Saputra, AD, et al., (2015). Analysis of the effect of flying time (time phase) on the mental load of the pilot using the Subjective Workload Assessment Technique (SWAT). The 17th FSTPT International Symposium at the University of Jember.

- Shah, M. M., et al. (2020). The Development Impact of PT. Medco E & P Malaka on Economic Aspects in East Aceh Regency. Budapest International Research and Critics Institute-Journal (BIRCI-Journal) Volume 3, No 1, Page: 276-286.
- Simanjuntak, Risma Adelina. (2010). "Analisis Pengaruh Diversi Terhadap Stres Mental Menggunakan Teknik Penilaian Beban Kerja Subjektif (SWAT)". Majalah Teknologi 3.1: 53-60
- Tarwaka (2015). Alat pengiris industri, ergonomi dasar, dan aplikasi tempat kerja. Surakarta: Penerbit Harapan.
- Werdhiastutie, A. et al. (2020). Achievement Motivation as Antecedents of Quality Improvement of Organizational Human Resources. Budapest International Research and Critics Institute-Journal (BIRCI-Journal) Volume 3, No 2, Page: 747-752.
- Widyanti, Ari; Johnson, Adi; Ward, Dick. (2010). Mengukur stres mental dalam pencarian tugas menggunakan Rating Scale Mental Effort Method (RSME). J@Ti (Teknik Industri). 5 (1): 1-6.
- Wignjosoebroto, Sritomo dan Purnawan Zaini. (2007). "Praktek mempelajari ergonomi kognitif untuk penerapan prosedur stres mental pilot dan kontrol pesawat menggunakan metode SWAT". Laboratorium Desain dan Teknologi Sistem Kerja, Fakultas Teknik Industri. Surabaya: Institut Teknologi Nopember Sepuluh