

Workload Analysis on Seeu.co Photo Studio In Batam City

Annisa Aqidatul Izzah¹ & Hajan Hidayat²

¹Batam State Polytechnic, aqizzah195@gmail.com , Indonesia

²Batam State Polytechnic, hajanhidayat@polibatam, Indonesia

Department of Business Management, Batam Indonesia State Polytechnic

Abstract. The purpose of this study is to analyze the work of photographers, videographers, and editors, to find out the amount of working time required by the workforce at the Seeu.co photo studio in Batam City and to determine the optimal amount of manpower requirements in accordance with needs on photo studio Seeu.co. This study uses a descriptive type of research. The workload analysis technique used is work sampling. Work sampling determines the number of observations of work activities in the form of machines, processes, and workers. With this method, researchers measure work using a stop-watch tool as a direct measurement of work. The results of this study based on observations that have been made, it is known that the workload of the workers at the Seeu.co photo studio in Batam City exceeds the normal workload, which is 409%. By knowing the workload that exceeds the normal limit, it takes 5 workers so that the work can be carried out optimally and minimize the perceived workload so that it is not too excessive so that it exceeds the normal limit.

Keywords: Workload, Labor, Working Time, Work Sampling.

1 Introduction

Human resources in a business play an important role in achieving the success and objectives of the business. For this reason, reliable human resources (HR) are needed [1].

In addition to human resources, workload measurement is equally important to improve performance. In order to create a comfortable working atmosphere, employees must be in a position that is in accordance with their abilities and the workload of employees is not expected to increase which causes their potential performance to decrease. According to Cain (2007), the purpose of measuring workload is to determine the mental costs that must be incurred when doing work in order to know the performance of the system and its workers [2].

Human resources certainly help achieve the success of a business, one of which is a business in the field of photography services. The development of the photography service business in recent years has increased. The increasing number of people who want to capture certain moments requires companies to be able to survive from competitors, especially in the same

field. The more businesses in the field of photography, the more business opportunities and competition among business owners will increase [3].

One of the businesses in the field of photography services is the Seeu.co photo studio in Batam City. Seeu.co is a business in the field of photography and videography services that was established in 2015. Over time, the business is growing, and is increasingly known to the public. So that in early 2021 new innovations will emerge by building a Seeu.co photo studio so that it is easy for people to use this photography service with an indoor theme.

With the construction of a photo studio, consumer demand has also increased. Such as pre-wedding photos in the studio (indoor) and in open spaces (outdoor). And other types of photos done in the studio. Thus the resulting output is certainly more than before the photo studio. Meanwhile, this photo studio only has 4 workers and each of them is still charged with several tasks.

In working on the resulting project can not be done in a short time. This is due to a small workforce while there are quite a lot of customer requests, especially for pre-wedding or wedding needs (can be one package). In the pre-wedding photo shoot process, it can take more than one day to be done in the studio or in a closed (indoor) and open (outdoor) place, while the consumer can only set a schedule on Saturdays and Sundays (weekends). This can happen due to weather factors, the selection of several places, various themes, and according to consumer demand.

From the photos taken for days, it produces a lot of output up to hundreds of photos/videos. Of the many photos, the editing process will be carried out which also takes a long time. So that with only 4 people, the completion of one project can take two weeks or even one month. Based on the explanation above, it can be concluded that the high workload is felt by each workforce, and it is necessary to add an optimal workforce in order to minimize the workload. However, this cannot be concluded without the real data and facts from the research results. Therefore, based on the above background, the researcher is interested in conducting a study with the title "WORKLOAD ANALYSIS AT SEEU.CO PHOTO STUDIO IN BATAM CITY".

2 Theory Study

2.1 Workload

In carrying out daily work activities, the human body has been designed to do appropriate work. Work has an important meaning in order to improve achievement and performance. When working the body will receive a load from outside the body. Every workload felt by workers must be balanced and in accordance with their abilities. Of course, work abilities differ from one another and depend on each person's ability [4]. So it can be concluded that the workload is the portion of work that a person receives when working in accordance with his physical ability to obtain information about how much effectiveness and efficiency a job is.

2.2 Factors Affecting Workload

There are two factors that affect workload, namely internal and external. Internal factors come from reactions in the body which include somatic factors (age, gender, health condition) and psychological factors (desire, satisfaction, motivation, belief). Furthermore, external factors, namely the load that comes from outside the worker's body, includes three aspects, namely the first physical (workplace, tools, work facilities) and mental (level of work difficulty, job responsibilities). The second is the length of time working, rest time, system remuneration. And the third is the work environment [5].

3 Methods The Research

Method used is descriptive qualitative research with case studies. The technique used in this research is work sampling. Work sampling determines the number of observations of work activities in the form of machines, processes, and workers. With this method, researchers measure work using a stop-watch tool as a direct measurement of work. Work that has a relatively long and non-repetitive time is recommended to use this work sampling method.

3.1 Research Object The

Object of this research is the Seeu.co photo studio which is located at Baloi Center Blok C, No. 48. By observing the positions of photographers, videographers, and editors in the photo studio.

3.2 Data Collection Methods

In brief, data collection techniques are methods used by researchers to collect various data, information, and other supporting facts for research purposes. In qualitative research methods, the data collected in the form of interviews and observations are as follows:

1. Interviews

According to Steward & Cash (1982), interviews are a predetermined communication process, designed to create interaction asking and answering certain questions [6]. The questions will be directly given by the researcher to the resource persons/research subjects, namely the workers at the Seeu.co photo studio, Batam City. The purpose of the interview is to complete data that cannot be obtained only by means of observation.

2. Observation

In applying observation, data collection is done by observing ongoing events and then recording back with supporting tools about the things to be studied [7]. In this study, observations were made to observe the productive or non-productive working time of the workers at the Seeu.co photo studio, Batam City.

3.3 Data analysis technique

Techniques Data analysis technique has several steps or stages that need to be carried out properly and correctly, while the stages are as follows:

1. Data Reduction

The merging process related to the selection of data and the concentration of problems to be managed. So that data reduction can provide a clear picture of the problems to be studied, making it easier for researchers to carry out the next stage. The data obtained are then summarized the important things that come from the results of interviews and observations.

2. Data Presentation The data

Will be presented in the form of a brief description and similar categories of the data it will be arranged in an orderly and easy to understand manner. Collecting data in this study related to job descriptions, average task completion time, and facilities used in doing a job. In this study the data are presented systematically in the form of narratives and tables.

3. Conclusion Drawing The conclusion

Drawing is the final stage in the research. The final conclusion includes all data withdrawals that are presented and then verified and can be tested for authenticity. The conclusions in qualitative research are expected to be new findings that have never existed before. These findings can be in the form of a description or description of an object that was previously unclear so that after research it becomes clear. The conclusion from the results obtained later is in the form of the percentage of workload experienced by workers at the Batam City Seeu.co photo studio, and determining the number of workers needed in order to minimize excessive workloads and create optimal work for the smooth performance of the business.

4 Results And Discussion

4.1 Workload analysis

In analyzing the workload using work sampling technique. The first step is to separate productive and non-productive activities. In work sampling, the element to be observed must be separated from other elements, as follows prepare all the necessary tools and set up the camera (element 1), conduct a photo/video shooting session (element 2), do editing on the photo/video (element 3), checking files and checking file editing (element 4), doing photo printing (element 5), carrying out work-related activities (element 6), then non-productive activities in the form of activities that are not so important such as unemployment, personal time, and so on (element 7). These elements can show how much time is spent on each element 1 to 6. All of these elements are activities that can occur while work is in progress. The next step is to determine the number of observations to be made. The working hours at the Seeu.co photo studio are 10 hours minus a break of 3 x 30 minutes or 90 minutes, so the effective working hours is 8.5 hours. The visits were carried out for 3 days with a time of 10 minutes each visit. To determine the random observation time, which is 8.5 hours x (60 minutes/10 minutes) is 51 times, the observer

has the right to determine the number of observations but not more than 51 times a day. And observers determine 30x observations in a day.

1. Recapitulation of Operator Observations A

Table 1. Percentage of Productive Operator A

Day	Working frequency observed		Total Observations	Percentage (%)	
	Productive	Non productive		Productive	Non productive
1	19	11	30	63	36
2	21	9	30	72	30
3	20	10	30	67	33
Total	60	30	90	66,67	33

Source: data processed by the author (2022)

The percentage of productive is the number of productive divided by the total observations.
 $P = 60/90 = 0.67$

Data uniformity test

Upper Control Limit Data (BKA) = $p \pm 3 (p(1-p))/N$
 $= 0.67 + 3 (0.67(1-0.67))/30 = 0.717$

Upper Control Limit (BKB) = $p \pm 3 (p(1-p))/N$
 $= 0.67 - 3 (0.67(1-0.67))/30 = 0.622$

Data Sufficiency Test

$$N' = \frac{k^2(1-p)}{s^2 \times p}$$

Information:

P = percentage of productive

K = constant level of confidence used (k = 2) i.e. 95%

S = level of accuracy in decimal form is 0.05

$N' = 39$

From the above calculation, it is known $N' < N$ is $39 < 90$ then the data is sufficient.

2. Recapitulation of Observations Operator B

Table 2. Percentage of Productive Operator B

Day	Working frequency observed		Total Observations	Percentage (%)	
	Productive	Non productive		Productive	Non productive
1	19	11	30	63	36
2	20	10	30	67	33
3	20	10	30	67	33
Total	59	31	90	65,67	34

Source: Data processed by the author, (2022)

The percentage of productive is the number of productive divided by the total observations.
 $P = 59/90 = 0.65$

Test of Uniformity of

$$\text{Upper Control Limit Data (BKA)} = p \pm 3 (p(1-p))/N$$

$$= 0.65 + 3 (0.65(1-0.65))/30 = 0.697$$

$$\text{Lower Control Limit (BKB)} = p \pm 3 (p(1-p))/N$$

$$= 0.65 - 3 (0.65(1-0.65))/30 = 0.602$$

Data Sufficiency Test

$$N' = \frac{k^2(1-p)}{s^2 \times p}$$

Information:

P = percentage of productive

K = constant level of confidence used (k = 2) i.e. 95%

S = level of accuracy in decimal form is 0.05

N' = 43

From the above calculation, it is known N' < N is 43 < 90 then the data is sufficient.

3. Recapitulation of Observations Operator C

Table 3. Percentage of Productive Operator C

Day	Working frequency observed		Total Observations	Percentage (%)	
	Productive	Non productive		Productive	Non productive
1	17	13	30	57	43
2	18	12	30	60	40
3	17	13	30	57	43
Total	52	38	90	58	42

Source: Data processed by the author, (2022)

The percentage of productive is the number of productive divided by the total observations.
 $P = 52/90 = 0.57$

Test of Uniformity of

$$\text{Upper Control Limit Data (BKA)} = p \pm 3 (p(1-p))/N$$

$$= 0.57 + 3 (0.57(1-0.57))/30 = 0.619$$

$$\text{Lower Control Limit (BKB)} = p \pm 3 (p(1-p))/N$$

$$= 0.57 - 3 (0.57(1-0.57))/30 = 0.520$$

Data Sufficiency Test

$$N' = \frac{k^2(1-p)}{s^2 \times p}$$

Information:

P = percentage of productive

K = constant level of confidence used (k = 2) i.e. 95%

S = level of accuracy in decimal form is 0.05

N' = 80

From the above calculation, it is known that N' < N ie 80 < 90 then the data is sufficient.

4. Recapitulation of Operator Observations D

Table 4. Percentage of Productive Operator D

Day	Working frequency observed		Total Observations	Percentage (%)	
	Productive	Non productive		Productive	Non productive
1	16	14	30	53	46
2	16	14	30	53	46
3	15	15	30	50	50
Total	47	43	90	49,67	47,33

source: Data processed by the author, (2022)

The percentage of productive is the number of productive divided by the total observations.

$$P = 47/90 = 0.52$$

Test of Uniformity of

$$\text{Upper Control Limit Data (BKA)} = p \pm 3 (p(1-p))/N$$

$$= 0.52 + 3 (0.52(1-0.52))/30 = 0.569$$

$$\text{Lower Control Limit (BKB)} = p \pm 3 (p(1-p))/N$$

$$= 0.52 - 3 (0.52(1-0.52))/30 = 0.470$$

Data Sufficiency Test

$$N' = \frac{k^2(1-p)}{s^2 \times p}$$

Information:

P = percentage of productive

K = constant level of confidence used (k = 2) i.e. 95%

S = level of accuracy in decimal form is 0.05

N' = 80

From the above calculation, it is known that N' < N is 80 < 90 then the data is sufficient.

4.2 Check Workload

Table 5. Elements of Work

Day	Elements	Total	Pieces Produces (OIU)
1	Prepare all the tools needed and set up the camera	46	20
2	Do photo/video shooting sessions	57	411
3	Edi photos/video	46	40
4	Check files and check editing files	17	10
5	Do photo printing	5	2
6	Doing work-related activities	33	10

source: Data processed by the author, (2022)

To determine the percentage of productive time for each work element, use the following equation:

$$Pw = (\text{Total Tally of Productive Elements}) / (\text{Total number of observations})$$

For each element, the percentage of productive time is calculated:

$$\text{Element 1, } Pw = 47/360 = 13.05\%$$

$$\text{Element 2, } Pw = 57/360 = 15.83\%$$

$$\text{Element 3, } Pw = 46/360 = 12.78\%$$

$$\text{Element 4, } Pw = 17/360 = 4.72\%$$

$$\text{Element 5, } Pw = 5/360 = 1.38\%$$

$$\text{Element 6, } Pw = 33/360 = 9.16\%$$

4.3 Number of Productive Minutes Work Element

$$Mw = Pw \times \text{Total Minutes Observation}$$

$$\text{Total Minutes Observations} = 4 \times 8.5 \times 60 \text{ (minutes)} = 2040 \text{ minutes}$$

$$\text{Element 1, } Mw = 13.05\% \times 2040 = 266 \text{ minutes}$$

$$\text{Element 2, } Mw = 15.83\% \times 2040 = 322 \text{ minutes}$$

$$\text{Element 3, } Mw = 12,78\% \times 2040 = 260 \text{ minutes}$$

$$\text{Element 4, } Mw = 4.72\% \times 2040 = 96 \text{ minutes}$$

$$\text{Element 5, } Mw = 1.38\% \times 2040 = 28 \text{ minutes}$$

$$\text{Element 6, } Mw = 9.16\% \times 2040 = 186 \text{ minutes}$$

4.4 Time Cycles per unit (OIU)

$$Ws = Mw / (\text{Number of OIU})$$

For each work element, the cycle time per unit (OIU) can be calculated:

$$\text{Element 1, } Ws = 266/20 = 13.3 \text{ minutes/unit}$$

$$\text{Element 2, } Ws = 322/411 = 0.78 \text{ minutes/unit}$$

$$\text{Element 3, } Ws = 260/40 = 6.5 \text{ minutes/unit}$$

$$\text{Element 4, } Ws = 96/10 = 9.6 \text{ minutes/unit}$$

$$\text{Element 5, } Ws = 28/2 = 14 \text{ minutes/unit}$$

$$\text{Element 2, } Ws = 186/10 = 18.6 \text{ minutes/unit}$$

4.5 Normal Time (NT)

$NT = W_s \times \text{Performance index or Rating (\%)}$

In calculating normal time, starting with determining the Performance index, it is obtained from observations with the following calculations:

Effective working hours = 8.5 hours

Observation time = 10 minutes

Random observation time = 8.5 hours \times (60 minutes/10 minutes) = 51 visits/day

Determination of factor rating with the Westing House system is obtained from observations that have been carried out:

Skills : Good (C1) + 0.06

Effort : Good (C2) + 0.02

Conditions : Average (D) 0.00

Consistency : Average (D) 0.00

The adjustment factor used is $P = 1$ or $P = 100\%$ (works normally)

Then $P = 1 + 0.08 = 1.08$

By knowing the Performance index according to the Westing House system, the next step can be to do is calculate Normal Time (NT) as follows:

Element 1, $NT = 13.3 \times 1.08 = 14.36$ minutes

Element 2, $NT = 0.78 \times 1.08 = 0.84$ minutes

Element 3, $NT = 6.5 \times 1.08 = 7.02$ minutes

Element 4, $NT = 9.6 \times 1.08 = 10.36$ minutes

Element 5, $NT = 14 \times 1.08 = 15.12$ minutes

Element 6, $NT = 18,6 \times 1.08 = 20.08$ minutes

4.6 Standard Time

To find out the labor time for each work element, use the following equation:

$W_b = NT \times 100 / (100 - \text{allowance})$

During the observation, the allowance value is obtained

Follows issued : 6.0 (very light)

Work attitude : 1.0 (sitting) and 2.0 (standing on two legs)

Work movement : 0 (normal)

Eye fatigue : 23

Total allowance (looseness) : 32

With a score obtained allowance, then the next step can determine the time u default for each element as follows:

$W_b = NT \times 100 / (100 - 32) = NT \times 1,470$

Element 1, $W_b = 14.36 \times 1,470 = 21.10$ minutes

Element 2, $Wb = 0.84 \times 1.470 = 1.23$ minutes
Element 3, $Wb = 7.02 \times 1.470 = 10.31$ minutes
Element 4, $Wb = 10.36 \times 1.470 = 15.22$ minutes
Element 5, $Wb = 15.12 \times 1.470 = 22.22$ minutes
Element 6, $Wb = 20.08 \times 1.470 = 29.51$ minutes
Total all standard time = 99.59 minutes/unit.

4.7 Calculating Workload

To find out the workload received by workers at the Seeu.co Photo Studio, Batam City, use the following equation:

$$\text{Workload} = \frac{\sum Wb \times OIU}{\text{Total Observation Time}} \times 100\%$$

$$\text{Average time standard} = 99.59/6 = 16.59$$

$$\text{Total observation time} = 4 \times 300 = 1200 \text{ minutes}$$

$$\text{Workload} = 409\%$$

By knowing the workload on workers in Photo Studio Seeu.co Batam City, obtained results that exceed the normal workload, namely 409%

4.8 Optimal Manpower Needs Analysis

To find out the optimal number of workers, use the following equation:

$$\text{Number of Workers} = OIU/(\text{total } Wb) = 493 / 79.13 = 4.95 \text{ 5 people.}$$

Based on the observations that have been made, according to the results obtained, it takes 5 workers at the Seeu.co Photo Studio, Batam City so that work can be carried out optimally and minimize the perceived workload so that it is not too excessive so that it exceeds normal limits.

5 Conclusion and Suggestion

5.1 Conclusion

Based on the research that has been done regarding "Workload Analysis in Improving Business Performance Case Studies at the Seeu.co Photo Studio in Batam City" then from these calculations the following results are obtained:

Work procedures as a performance appraisal tool, especially in terms of clarity of work processes in the environment organization including the responsible work unit.

The purpose of the construction of the Seeu.co photo studio is to provide services in the field of photography, to provide a photo studio as a medium for producing attractive photos, to fulfill consumer desires according to demand, to prioritize customer satisfaction, and to create creative ideas. Seeu.co's working procedures are to thoroughly check the physical camera and adjust the camera, conduct photo/video capture sessions, edit photos/videos, check files and check files

again, print photos, make sure after use make sure the camera and other supporting tools neatly in place.

From observations that have been made for 3 days on 4 workers in the Seeu.co photo studio in Batam City using a research method, namely work sampling, it is calculated the percentage of productive time, number of productive minutes of work elements, cycle time per unit, normal time, standard time, and standard time. Thus the results of these calculations obtained a workload of 409%. With these results it is categorized as an overload. After obtaining the workload results from these calculations, the optimal number of workers is obtained as many as 5 people in order to minimize the workload so that it is not too overloaded.

5.2 Suggestion

It is hoped that with this research, the Seeu.co photo studio can consider the results obtained during the research to evaluate each workload felt by the workforce at the Seeu.co photo studio and add 1 person to the workforce so that the workload is increased. perceived as not excessive and the business performance of the Seeu.co photo studio will increase.

It is hoped that the research can be used in the future as a source for further research with a larger number of samples, different places, and keeping in touch with work sampling.

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