DETERMINATION OF THE OPTIMAL NUMBER OF EMPLOYEES USING THE FULL TIME EQUIVALENT (FTE) METHOD AT PT. XYZ

Muhammad Dahlan¹, Nurhayati Rauf², Takdir Alisyahbana³, Andi Pawennari⁴, Dirgahayu lantara⁵, Rahmaniah Malik⁶, Arfandi Ahmad⁷ Yusril Mahenra⁸

Study Program of Industrial Engineering, Faculty of Industrial Technology, Indonesian Muslim University
Jl. Urip Sumoharjo Km. 5 Makassar., Sulawesi Selatan 90231
yusrilmahenrat@gmail.com

ABSTRACT

Determining the optimal number of employees in a company is a basic condition that must be concern into account when drafting a work plan. The work design process ultimately aims for balance the physical and mental aspects of humans in completing certain tasks so that. Determination of the number of employees with the existing workload will support employees performance in perform their duties optimally. The purpose of this research is to determine the optimal number of salesman based on the workload calculated using the Full Time Equivalent method. Based on the results of research at PT. Xyz used the method FTE is known that the workload of the 4 salesman is classified as overloaded. Where is sales I has a workload of 1.48, sales II has a workload of 1.70, sales III has a workload of 1.66, sales IV get a workload of 1.42. Based on the table of labor requirements to the FTE value, the number of initial salesman was 4 sales and the addition of the number of salesman is as many as 10 salesmen. So, the optimal number of salesmen in Makassar city is 14 salesmen.

Keywords: Workload, Work Effectiveness, Full Time Equivalent
I. PENDAHULUAN

Determination of the optimal number of employees in a company, is a basic condition that must be considered in preparing work plans. The work design process ultimately aims to balance the physical and mental aspects of humans in completing certain tasks so that the determination of the number of employees with the existing workload will support employee performance in carrying out their duties optimally.

In research (Tho’in, 2016) according to Jhon, et al, (2018) Every company certainly needs competent people to advance its company. In a world dominated by the service sector, the importance of human capital cannot be denied. To get a return on investment (Return on Investment) physical and technological resources, companies are highly dependent on the competence of workers. In a broad sense, human capital, which is defined as the skills, dexterity, and knowledge of a group of people, is the main determinant of economic growth today.

One of the problems experienced by PT. XYZ, namely the non-optimal performance of employees (salesmen) in placing orders at outlets because the distance between each outlet area visited by salesmen is not in accordance with the visiting hours to the outlet and the target outlet that must be visited in a day. So that salesmen experience fatigue in maximizing the target of visits per day and time when ordering at each outlet. This problem has been experienced since the covid-19 pandemic which resulted in the company reducing salesmen from 6 people to 4 people. This reduction is done to reduce the company's expenses. However, this reduction actually resulted in a decrease in revenue turnover from ordering goods because the workload received by the salesman was too heavy. So this research is focused on measuring workload to determine the optimal number of employees so that salesmen can meet company targets and maximize orders during visits to outlets.

According to BKN (2001), the workload is the average frequency of each type of work in a certain period of time. Estimating the workload of each each organizational unit can be done based on calculations or based on experience. As for Hasibuan (2005), workload analysis is determining the number of workers required to complete a job in certain period of time.

In research (Rama Adi, 2020) according to Nilasari (2016) FTE is the number of working hours of full-time or full-time employees during a certain period of time, for example in one month or one year (Nilasari, dwi. 2016). The FTE method is a way of calculating the observed input and output of employees and then calculated based on the unit of time (Karo & Adianto, 2014).

II. RESEARCH METHODS

2.1 Time and Place

This research was conducted for 1 month in April-May 2021, this research was conducted at PT. XYZ Makassar City, South Sulawesi.

2.2 Data Collection

2.2.1 Primary Data

Primary Data in this study were obtained directly from the object of research through observation, namely as follows:
1. Allowance Data
2. Working Time

2.2.2 Secondary Data

Secondary Data in this study were obtained from existing data such as corporate documentation data and other information related to the research. Secondary data in this study are as follows:
1. Number of Salesman
2. Workload of Salesman
3. Visits Data
4. Working Hours Data

2.3 Full Time Equivalent Method

The data used in this study using a Full Time Equivalent (FTE):
1. Calculating for Cycle Time and Adequacy Data
2. Uniformity Test
3. Rating Factor Test
4. Calculating Activity Processing Time
5. Calculating Workload

III. RESULTS AND DISCUSSION

Calculating Cycle Time and Sufficiency of Data
| Sales | No | Activity            | Intensity | WS  | N   | N'  | DES |
|-------|----|---------------------|-----------|-----|-----|-----|-----|
|       | 1  | Driving             | Daily     | 48.27 | 8   | 0.85 | Enough |
| Sales 1 | 2  | Arrived at The Shop | Daily     | 4.26  | 8   | 6.60 | Enough |
|       | 3  | Check Stok in Warehouse | Daily | 33.20 | 8   | 1.32 | Enough |
|       | 4  | Make an Order       | Daily     | 10.84 | 8   | 0.64 | Enough |
|       | 5  | Queue               | Daily     | 40.48 | 8   | 0.12 | Enough |
|       | 6  | Deposing order to Admin | Daily | 9.81  | 8   | 0.65 | Enough |
| Sales 2 | 1  | Driving             | Daily     | 52.45 | 8   | 1.65 | Enough |
|       | 2  | Arrived at The Shop | Daily     | 3.76  | 8   | 4.41 | Enough |
|       | 3  | Check Stok in Warehouse | Daily | 46.51 | 8   | 0.12 | Enough |
|       | 4  | Make an Order       | Daily     | 10.84 | 8   | 0.64 | Enough |
|       | 5  | Queue               | Daily     | 45.85 | 8   | 0.61 | Enough |
|       | 6  | Deposing order to Admin | Daily | 11.36 | 8   | 1.53 | Enough |
| Sales 3 | 1  | Driving             | Daily     | 51.00 | 8   | 1.06 | Enough |
|       | 2  | Arrived at The Shop | Daily     | 5.22  | 8   | 5.30 | Enough |
|       | 3  | Check Stok in Warehouse | Daily | 34.67 | 8   | 1.11 | Enough |
|       | 4  | Make an Order       | Daily     | 11.89 | 8   | 2.43 | Enough |
|       | 5  | Queue               | Daily     | 46.23 | 8   | 0.15 | Enough |
|       | 6  | Deposing order to Admin | Daily | 10.97 | 8   | 1.45 | Enough |
| Sales 4 | 1  | Driving             | Daily     | 47.84 | 8   | 1.45 | Enough |
|       | 2  | Arrived at The Shop | Daily     | 4.47  | 8   | 0.80 | Enough |
|       | 3  | Check Stok in Warehouse | Daily | 27.23 | 8   | 2.38 | Enough |
|       | 4  | Make an Order       | Daily     | 13.78 | 8   | 1.77 | Enough |
|       | 5  | Queue               | Daily     | 45.94 | 8   | 0.48 | Enough |
|       | 6  | Deposing order to Admin | Daily | 11.26 | 8   | 0.08 | Enough |

### 3.2

### 3.3 Data Uniformity Test

At this stage, the first data test is data adequacy test, there are 2 factors influencing namely the level of confidence (k) and the level of accuracy (s). The level of confidence used is 95% or equal to 2 and the level of accuracy used is 10% or 0.
From graph 1 shows that there is no data that is out of control limits. This means that the data obtained is uniform.

Graph 2. Uniformity of Sales Data

From graph 2 shows that there is no data that goes out of control limits. This means that the data obtained is uniform.

Graph 3. Uniformity of Sales Data

From graph 3 shows that there is no data that is out of control limits. This means that the data obtained is uniform.

Graph 4. Uniformity of Sales Data

From graph 4 shows that there is no data that is out of control limits. This means that the data obtained is uniform.

3.4 Rating Factor Test

The adjustment factor or performance rating is the activity of assessing or evaluating the operator's work speed. By doing this rating, it is expected that the measured working time can be normalized again. The method used is the method westinghouse. The performance rating value is assessed according to direct observations made by researchers on the performance of each salesman in each element.
| Sales  | No | Activity                  | Intensity | KP  | UH  | KJ  | KS  | RF   |
|--------|----|---------------------------|-----------|-----|-----|-----|-----|------|
| Sales 1| 1  | Driving                   | Daily     | 0.06| 0.02| 0.02| 0.01| 1.11 |
|        | 2  | Arrived at The Shop       | Daily     | 0.00| 0.02| 0.02| 0.00| 1.04 |
|        | 3  | Check Stock in Warehouse  | Daily     | 0.03| 0.02| 0.02| 0.01| 1.08 |
|        | 4  | Make an Order             | Daily     | 0.03| 0.02| 0.02| 0.01| 1.08 |
|        | 5  | Queue                     | Daily     | 0.00| 0.00| 0.02| 0.00| 1.02 |
|        | 6  | Depositing order to Admin | Daily     | 0.03| 0.02| 0.02| 0.01| 1.08 |
| Sales 2| 1  | Driving                   | Daily     | 0.06| 0.00| 0.02| 0.00| 1.08 |
|        | 2  | Arrived at The Shop       | Daily     | 0.00| 0.00| 0.02| 0.00| 1.02 |
|        | 3  | Check Stock in Warehouse  | Daily     | 0.00| 0.02| 0.02| 0.00| 1.04 |
|        | 4  | Make an Order             | Daily     | 0.00| 0.02| 0.02| 0.01| 1.05 |
|        | 5  | Queue                     | Daily     | 0.00| 0.00| 0.02| 0.00| 1.02 |
|        | 6  | Depositing order to Admin | Daily     | 0.03| 0.02| 0.02| 0.00| 1.07 |
| Sales 3| 1  | Driving                   | Daily     | 0.06| 0.00| 0.03| 0.00| 1.09 |
|        | 2  | Arrived at The Shop       | Daily     | 0.00| 0.00| 0.02| 0.00| 1.02 |
|        | 3  | Check Stock in Warehouse  | Daily     | 0.00| 0.02| 0.02| 0.01| 1.05 |
|        | 4  | Make an Order             | Daily     | 0.03| 0.02| 0.02| 0.00| 1.07 |
|        | 5  | Queue                     | Daily     | 0.00| 0.00| 0.02| 0.00| 1.02 |
|        | 6  | Depositing order to Admin | Daily     | 0.03| 0.02| 0.02| 0.01| 1.08 |
| Sales 4| 1  | Driving                   | Daily     | 0.06| 0.00| 0.03| 0.00| 1.09 |
|        | 2  | Arrived at The Shop       | Daily     | 0.00| 0.00| 0.02| 0.00| 1.02 |
|        | 3  | Check Stock in Warehouse  | Daily     | 0.00| 0.02| 0.02| 0.01| 1.05 |
|        | 4  | Make an Order             | Daily     | 0.03| 0.02| 0.02| 0.00| 1.07 |
|        | 5  | Queue                     | Daily     | 0.00| 0.00| 0.02| 0.00| 1.02 |
|        | 6  | Depositing order to Admin | Daily     | 0.03| 0.02| 0.02| 0.01| 1.08 |

Table 3. Activity Process Time All Work

| Sales  | No | Activity                  | Intensity | RF  | WS  | WN  | WB  |
|--------|----|---------------------------|-----------|-----|-----|-----|-----|
| Sales 1| 1  | Driving                   | Daily     | 1.11| 48.27| 53.58| 61.62|
|        | 2  | Arrived at The Shop       | Daily     | 1.04| 4.34 | 4.51 | 5.18 |
|        | 3  | Check Stock in Warehouse  | Daily     | 1.08| 33.20| 35.86| 41.24|
|        | 4  | Make an Order             | Daily     | 1.08| 10.84| 11.70| 13.46|
|        | 5  | Queue                     | Daily     | 1.07| 40.48| 41.29| 47.48|
|        | 6  | Depositing order to Admin | Daily     | 1.08| 9.81 | 10.59| 12.18|
| Sales 2| 1  | Driving                   | Daily     | 1.08| 40.39| 50.88| 59.52|
|        | 2  | Arrived at The Shop       | Daily     | 1.02| 3.76 | 3.84 | 4.49 |
|        | 3  | Check Stock in Warehouse  | Daily     | 1.04| 30.36| 48.37| 56.60|
|        | 4  | Make an Order             | Daily     | 1.05| 10.84| 11.38| 13.31|
|        | 5  | Queue                     | Daily     | 1.07| 27.75| 46.77| 54.72|
|        | 6  | Depositing order to Admin | Daily     | 1.07| 11.36| 12.15| 14.22|
| Sales 3| 1  | Driving                   | Daily     | 1.08| 51.00| 49.47| 58.87|
|        | 2  | Arrived at The Shop       | Daily     | 1.02| 5.22 | 5.33 | 6.34 |
|        | 3  | Check Stock in Warehouse  | Daily     | 1.07| 34.67| 37.09| 44.14|
|        | 4  | Make an Order             | Daily     | 1.05| 11.89| 12.48| 14.86|
|        | 5  | Queue                     | Daily     | 1.02| 46.23| 47.15| 56.11|
|        | 6  | Depositing order to Admin | Daily     | 1.05| 10.97| 11.52| 13.71|
Based on the table above, it can be seen that the performance rating or RF work element value is the average of each salesman. These values are obtained from observations according to the rating system Westinghouse.

3.5 Full Time Equivalent

Workload calculation is based on total standard time each salesman a day and working time per day. The calculation of the workload salesman’s that can be seen in each is in the table above. The following is an example of the calculation to get FTE at sales work station 1:

Total Element Hours = Frequency x Standard Time x Number of Working Days/60

Hours / Year = 200 x 61.62 minutes x 285 days /3600 = 848.35

FTE = (Total working hours of elements per year) / Effective working hours per year

FTE = 975.65 / 1938 = 0.50

| Table 4. Value of FTE Each Sales |
|-------------------------------|
| Sales            | Score FTE |
| Sales 1          | 1.48      |
| Sales 2          | 1.70      |
| Sales 3          | 1.66      |
| Sales 4          | 1.42      |

Based on the table above, sales 1 gets a workload. This is excessive because the total FTE of all activity elements is above > 1.28, namely 1.48, which is classified in the category overload, therefore recommendations need to be made. For sales 2, they have an excessive workload, this is because the total FTE of all activity elements is above > 1.28, namely 1.70, which is classified in the category overload, therefore recommendations need to be made. For sales 3, they have an excessive workload, this is because the total FTE of all activity elements is above > 1.28, namely 1.66, which is classified in the category overload, therefore recommendations need to be made. And for sales 4 they have an excessive workload, this is because the total FTE of all activity elements is above > 1.28, namely 1.42, which is classified in the category overload, therefore recommendations need to be made.

IV. CONCLUSION AND SUGGESTION

4.1 Conclusion

Based on the research objectives to be achieved in calculating the workload using the FTE method:

1. Based on the research that has been carried out at PT. XYZ on the salesman section, it can be concluded that the overload workload received in sales 1 gets an excessive workload, this is because the total FTE of all activity elements is above > 1.28, namely 1.48, which is classified in the category overload. In sales 2, the workload is excessive, this is because the total FTE of all activity elements is above > 1.28, which is 1.70, which is included in the category. Sales 3 has an excessive workload, this is because the total FTE of all activity elements is above > 1.28, namely 1.66, which is classified in the category. Sales 4 has an excessive workload, this is because the total FTE of all activity elements is above > 1.28, which is 1.42, which is classified in the category.

2. Based on the results of the FTE calculation, it is known that the workload of the 4 salesmen is classified as overloaded. Based on the table of labor requirements for the FTE value, the number of initial salesmen is 4 sales and the addition of the number of salesmen is 10 salesmen. So thenumber of salesmen optimal in Makassar City is 14 salesmen.

4.2 Suggestions

There are several suggestions for improvement that can be taken into consideration for further research, namely:
1. Further research can use other workload calculation methods to calculate the optimal number of labor requirements and costs incurred.

2. Further research can determine the division of tasks into each store in sales each region in Makassar City.

**DAFTAR PUSTAKA**

Abdussamad, Z. (2014). Pengaruh Kompensasi Terhadap Produktivitas Kerja Karyawan Pada PT. Asuransi Jiwasraya Gorontalo. Jurnal Manajemen/Volume XVIII, No. 03, 456-466.

Ahyadi, H., Saputra, R., & Suhartanto, E. (2015). Analisis Keseimbangan Lintas An Untuk Meningkatkan Proses Produksi Pada Air Mineral Dalam Kemasan. Jurnal Program Studi Teknik Industri, FTI-ISTN, 139 - 148.

Ajitia, N. M. G. (2017). Efektivitas Manpower Planning dengan Menggunakan Metode Analisi Beban Kerja (Work Load Analysis Berdasarkan Pendekatan Full Time Equivalent (Studi Pada Divisi Pengembangan Karir, Organisasi, dan Kompetensi di PT. Pupuk). Jurnal Administrasi Bisnis (JAB)|Vol. 42 No. 1 Januari 2017, 27-35.

Arsi, R. M., & Prativi, S. G. (2012). Analisis Beban Kerja untuk Menentukan Jumlah Optimal Karyawan dan Faktor Faktor yang Mempengaruhi Karyawan (Studi Kasus: Jurusan Teknik Industri, ITS, Surabaya). JURNAL TEKNIK ITS Vol. 1, No. 1 ISSN: 2301-9271, A-526 - A-529.

Aulia, N. (2018). 143 Analisis Beban Kerja Untuk Menentukan Jumlah Optimal Pada UD. Nagawangi Alam Sejahtera. Jurnal Teknik IndustriS.1, Institut Teknologi Nasional Malang, 143-148.

Dewi, W. C., & AL-Ghofari, A. K. (2020). Analisis Beban Kerja Dengan Metode Full Time Equivalent (FTE) Untuk Menentukan Kebutuhan Operator Proses Pengemasan Kosmetik PT.XYZ. Teknik Industri UMS (18 Maret 2020), 96-103.

Fernanda, A. (2014). Workload Analysis For Determining The Optimal Number Of Employees (Case Study : Engineering Departemen and Administration Departement PT PLN (Persero) Rayon Sidoarjo Kota). Jurnal TEKNIK INDUSTRI, 1-166.

Hanifa Putri, N. S., & Hari, P. (2018). Penentuan Jumlah Karyawan Dengan Metode Full Time Equivalent (FTE) (STUDY KASUS PT. WY). Jurnal Teknologi Industri Universitas Islam Indonesia, 173 - 177.

Hudaningsih, N., & Prayoga, R. (2019). Analisis Kebutuhan Karyawan Dengan Menggunakan Metode Fulltime Equivalent (FTE) Pada Departemen Produksi PT. Borsya Cipta Communica. JURNAL TAMORA VOL. 3 NO. 2 JUNI 2019, 98-106.

I Gede Ukas Aksama, K. K. (2019). Pengaruh Beban Kerja Terhadap Kinerja Sales Promotion Dengan Motivasi Sebagai Variabel Moderasi di PT. Word Innovative Telecommunication Cabang Singaraja. Jurnal Prospek, Vol. 1 No. 2 Bulan Desember Tahun 2019, 67-73.

Iskandar, D. (2018). Strategi Peningkatan Perusahaan Melalui Pengelolaan Sumber Daya Manusia dan Kepuasan Kerja dan Dampaknya Terhadap Produktivitas Karyawan. Jurnal JIBEKA Volume 12, No 1, 23 - 31.

Iskarim, M. (2017). Rekrutmen PegawaiMenuju Kinerja Organisasi yang Berkualitas dalam Perspektif MSDMdan Islam. Jurnal Manajemen Pendidikan Islam, 307-327.

Kalangi, R. (2015). Pengembangan Sumber Daya Manusia Dan Kinerja. Jurnal LPPM Bidang EkoSosBudKum, 1-18.

Karo, G. K., & Adianto, E. (2014). Pengukuran Produktivitas Karyawan Dengan Metode Full Time Equivalent (FTE) PT. Astra International Tbk Divisi Astra Motor Penempatan Jakarta Honda Center. Journal of Industrial Engineering Management Systems Vol. 7, No 1, 81-87.

Labudo, Y. (2013). Disiplin Kerja dan Kompensasi Pengaruhnya Terhadap Produktivitas Karyawan. Jurnal EMBA Vol.1 No.3, 55-62.

Mochammad Taufan Permana Putra, U. P. (2016). Hubungan Antara Beban Kerja Dengan Intensi Turnover Pada Karyawan DI PT. “X”. Jurnal Empati, April 2016, Volume 5(2), 303-307, 303-307.

Rama Adi, R. (2020). Penentuan Jumlah Teller Berbasis Beban Kerja Dengan Metode
Regent Monotororing, Y. D. (2018). Usulan Waktu Baku Proses Racking Produk Amplimesh Dengan Metode Jam Henti Pada Departemen Powder Coating. *Jurnal Teknik: Universitas Muhammadiyah Tangerang, Vol. 7, No. 2, Juli – Desember*, 53-63.

Siti, W., & Adrian, M. I. (2017). Penentuan Jumlah Karyawan Yang Optimal Pada Penanaman Lahan Kelapa Sawit Dengan Menggunakan Metode Work Load Analysis (WLA)(Studi Kasus : PT. Bumi Palma Kabupaten Indragiri Hilir Riau). *Jurnal Teknik Industri*, 46 - 52.

Sugiono, H. S., & Palit, H. C. (2016). Penentuan Jumlah Tenaga Kerja Pada Departemen MPC:A Case Study. *Jurnal Titra, Vol. 4, No. 2, 223-228.*

Sutaraksana, I. Z., Anggawisastra, R., & Tjakraatmaja, J. H. (2006). *Teknik Perancangan Sistem Kerja*. Bandung: ITB.

Tho'in, M. (2016). Kompetensi Sumber Daya Manusia Bank Syariah. *Jurnal Ilmiah Ekonomi Islam VOL. 02, NO. 03, November 2016*, 158-171.

Tridoyo, S. (2014). Analisis Beban Kerja Dengan Metode Fulltime Equivalent Untuk Mengoptimalkan Kinerja Karyawan Pada PT. Astra International TBK-Honda Sales Operation Region Semarang. *Jurnal Teknik Industri, Fakultas Teknik, Universitas Diponegoro, 1-8.*

Widayati, C. (2016). Pengaruh Kecerdasan Emosional, Tingkat Pendidikan dan Karir Terhadap Kinerja Karyawan (Studi Kasus Pada Sales Marketing PT. Astra International Daihtsu Cabang Tangerang). *Jurnal Widayati: Pengaruh Kecerdasan Emosional, Tingkat Pendidikan, dan Karir, 213-231.*

Winarti, E. (2018). Perencanaan Manajemen Sumber Daya Manusia Lembaga Pendidikan. *Jurnal Tarbiyatuna Volume 3 Nomor 1(Januari-Junii)2018, 1-26.*

Yasmin, Z. A., & Ariyanti, S. (2018). Analisis Beban Kerja Pada Maintenance BD-CHECK Dengan Metode Full Time Equivalent. *Jurnal Ilmiah Teknik Industri (2018), Vol. 6 No. 1, 55 – 62, 55 - 62.*