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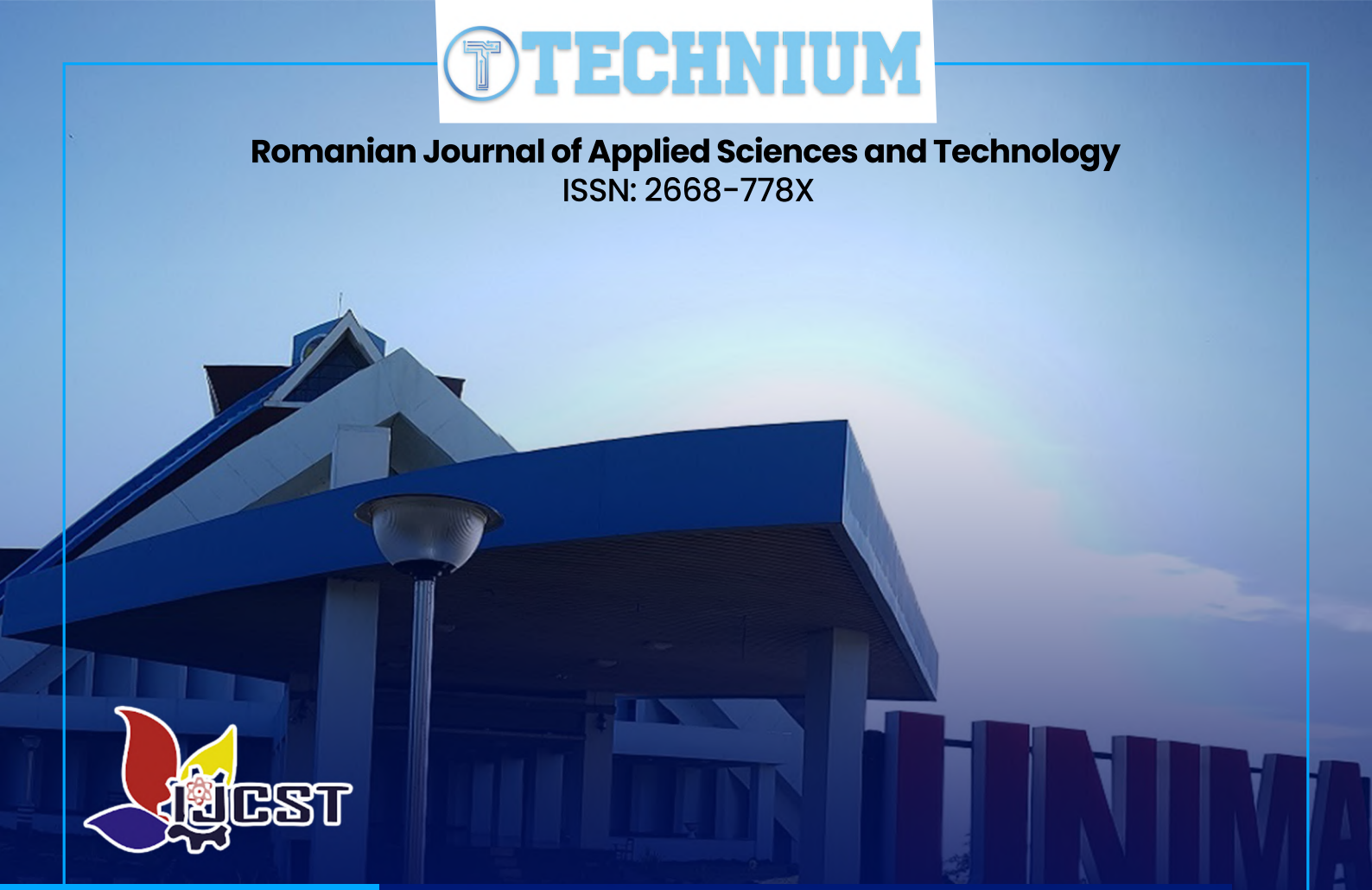

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PRODUCTIVITY ANALYSIS AND IMPROVEMENT OF THE PRODUCTION DEPARTMENT AT PT. POJUR - MADURA USING THE OBJECTIVE MATRIX (OMAX) METHOD

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Abstract. The growth of the industrial sector in 2023 will increase, this condition is reflected in the trend of the level of expansion in the value of the Industrial Confidence Index (IKI) which has increased. PT. Pojur is a company located in the Sumenep area engaged in the gas cylinder industry. For a business to survive and continue to grow, a business must be able to compete by maintaining product quality. One of the company's strategies that can be used is by measuring the company's productivity. This is used to determine the extent to which the effectiveness of the products produced and the efficiency of the use of resources owned by PT. Pojur. Several variables that affect productivity include raw materials, energy and labor used. The purpose of this study is to find out what the productivity index is at PT. Pojur with the Objective matrix (OMAX) method. The results of measuring productivity during the period January to December 2022 show a productivity of 19%, while the highest productivity occurs in November and December with a total of 26% and the lowest productivity is in January with a total of 0% and the cause of decreased productivity in the production section is lack of maintenance on machines and the lack of operator expertise in carrying out production.

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1 Introduction

Every industrial business faces competition because of the rapid development of industry in today's global era [1]. To survive and compete with other companies, today's business must develop and improve its performance. Companies need clear goals to be able to compete in an increasingly fierce environment. Clear goals make it easier to assess and inspire performance improvement [2].

PT Pojur is a company located in Daramista Village, Lenteng District, Sumenep Regency which is engaged in the LPG gas cylinder maintenance workshop. The maintenance workshop here includes painting and welding tubes and repairing dented cylinders, re-weighing and covering the distribution of gas cylinders to the nearest SPBE places located in Saronggi and Pekandangan. Maintenance of quality 3KG LPG gas cylinders and guaranteed packaging to avoid leaks in the tube or defects in the tube needs improvement to produce quality products and make consumers comfortable.

Based on the results of interviews and observations in the production department, the tube repair process has varying levels of difficulty for each process. Therefore, PT Pojur must really utilize resources efficiently to get production results according to the target so that it can increase the productivity value of the company which will have an impact on profits.

From these problems, PT Pojur needs to measure the level of product effectiveness and efficiency of resource use. One way to measure the value of the effectiveness and efficiency of a business entity is by measuring productivity. When the level of productivity is known, PT Pojur can take steps to exercise control over its resources to maximize profits.

2 Literature Review

Productivity is related to the effectiveness and efficiency of resource (input) utilization in producing output [13,15]. Where effectiveness is the degree of achievement of output from the production system while efficiency is a measure that shows the extent to which resources are used in the production process to produce output [2,3]. Productivity measures are the best way to evaluate a country's ability to provide a good standard of living for its population. With increased productivity, living standards can improve. With increased productivity, labor, capital, and management can receive additional payments. If labor, capital, and management are increased without increasing productivity, prices will rise [4.5]. But on the other hand, price pressure when productivity increases will result in more production with the same number of resources.

Productivity is the ratio of value (output) to the results of the input (input) that can be used in the process of implementing activities. Productivity is used as a tool to analyze and review the formation of production productivity and find out how the company optimally uses its resources to produce targeted products [3].

Productivity can be increased by productivity factors, namely producing more products or which products are better with a certain level of resources [5]. Thus, productivity is defined as the ratio between the output (results) of the organization with the required input. Productivity can be calculated by dividing output by input.

2.1 Basic Concepts of Productivity

The term efficiency first appears in a text he wrote in 1776. Bite from France. However, the philosophy and existence of the show has been since the beginning of human civilization on earth. Productivity means human effort or desire to always improve the quality of life with as few resources as possible. Executing one-way and smooth production flows and executing multiple processes simultaneously is very useful for increasing productivity, work, quality, production turnaround time, stock levels and space utilization. Productivity is not the same as production, it is production, quality, this result is a component of efforts to increase productivity. So, productivity combines effectiveness with efficiency [6].

The concepts of open productivity and efficiency are now largely oriented towards concrete production systems (SCM). Subject This is understandable because the concrete production system of all input components, processes and results is real and easy to measure. Regardless of the differences in the definitions above, the same thing holds true, namely the assumption that product quality is constant [7].

The productivity cycle is a performance improvement process including a formal organizational structure from the highest level to the lowest level. Increased productivity must be included in the organization's program on a regular basis because increasing productivity requires a long-term commitment. Sumanth, in Eko explains that the productivity cycle consists of four stages, namely [2]:

1. Productivity Measurements
2. Productivity Evaluation
3. Productivity Evaluation
4. Productivity Improvement

The four elements above can form a circle that must be done continuously and repeatedly to get optimal benefits.

2.2 Overall Equipment Effectiveness (OEE)

Overall Equipment Effectiveness (OEE) is a method of measuring the level of efficiency in the use of equipment or a system by including several aspects in the calculation process. OEE is a measurement of machine/equipment efficiency by calculating machine availability (Availability), machine performance (Performance) and product quality (Quality). OEE is also a measuring tool for evaluating and designing the right way to ensure increased performance when using the machine [10]. Overall Equipment Effectiveness

(OEE) is a calculation of how far the level of effectiveness has been determined by existing machines or equipment. Generally, Overall Equipment Effectiveness (OEE) is used as an indicator of the effectiveness of a machine or equipment. Overall Equipment Effectiveness (OEE) measurements can be used to find area efficiency or parts of the production process that need to be developed on the production line [11].

Overall Equipment Effectiveness (OEE) is used as a tool to increase sustainable benefits, including:

1. As a reference to improve machine/equipment performance.
2. Improve quality by minimizing rework and defective products.
3. Minimize machine repair costs as OEE can expect unexpected shutdowns and slowdowns.
4. Increased service life of the machine/equipment.
5. Provide important and accurate information so that appropriate actions can be taken to increase efficiency.
6. Overall Equipment Effectiveness (OEE) improvement will help companies increase their competitiveness.

2.3 Objective Matrix (OMAX)

The objective matrix (OMAX) is a performance analysis measurement designed to determine the level of performance in each part of the company using performance criteria that are in accordance with the existence of parts of the company [8,14]. Productivity measurement uses the objective matrix (OMAX) method which has been applied to objectively evaluate the work of each company department and the factors causing the decline in the production department [12].

The objective matrix (OMAX) has three important aspects, namely: awareness, improvement and maintenance [1]. In the Objective matrix (OMAX) measurement system as much as possible at the business unit level so that staff members can play a role in evaluation, improvement, and performance levels. This system can encourage everyone to develop awareness of the importance of the company's performance level. This will create awareness of caring for each member's improvement to achieve or move from the planned level of productivity to the increase achieved will motivate each employee to claim that it is not decreasing but expected to increase.

3 Method

The research method is a science that contains various ways of working in carrying out research from beginning to end. This research method is also one of the stages of problem solving which will be made as a framework for carrying out research in order to obtain a clearer and more directed systematic research implementation. The method used is the OMAX method with the following steps:

1. Define criteria on productivity
2. Set on a scale value
3. Set on the weight of the criteria
4. Measuring indicators on productivity

4 Result and Discussion

Productivity criteria can be stated in the ratio comparison to be measured in data processing, there are three criteria, namely:

Criterion 1, namely raw materials (ratio 1)
Criterion 2 is productivity of effective working hours (ratio 2)
Criterion 3 is production effectiveness (ratio 3)

Table 1 Scores Level 1-2 and 4-9 for each criterion

Skala	Rasio 1	Rasio 2	Rasio 3
Level 1-2	0,210283	0,07	24.239
Level 4-9	0,031717	0,16	10.693

Source: Data Management

Based on table 4.4.12, the values obtained for each criterion at level 1-2 at ratio 1 are 0.210283, ratio 2 is 0.07 and ratio 3 is 24,239, while at levels 4-9 obtained at ratio 1 is 0, 031717, ratio 2 is 0.16 and ratio 3 is 10.693.

Table 2 Weight for each criterion

No	Kriteria produktivitas	Bobot	%
1	Bahan baku %	0,655	66 %
2	Jam Efektif	0,186	19%
3	Efektivitas produk (unit/jam)	0,157	16%

Source: Data Management

Table 3 Recapitulation of Productivity Levels

Bulan	Tingkat produktivitas
Januari	0
Februari	684
Maret	551
April	551
Mei	567
Juni	558
Juli	622
Agustus	558
September	622
Oktober	567
November	765
Desember	788
Jumlah	6833

Source: Data Management

From the table above it can be seen from January to December with a balance of 6,833, while the largest value in December is 788 and the lowest value in January is 0. The following is a graph of the level of productivity

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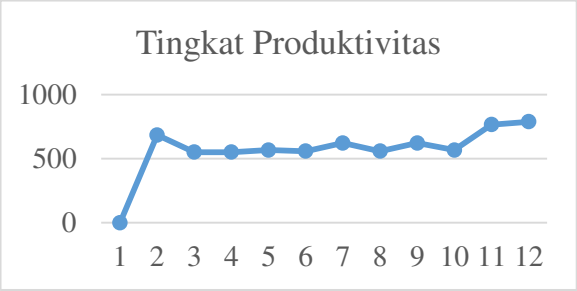

Figure 1 Graph of Productivity Levels

From the graphic image of the productivity level from January to December 2022, it can be seen that the highest value was in December, namely 788, this is above the average, in the month the production process runs smoothly. The lowest product occurred in January, namely 0, this was caused by the ratio 1, ratio 2 and ratio 3 which were below average.

Table 4 Productivity Index Recapitulation

Bulan	Indeks Produktivitas
Januari	0%
Februari	23%
Maret	18%
April	18%
Mei	19%
Juni	19%
Juli	21%
Agustus	19%
September	21%
Oktober	19%
November	26%
Desember	26%
Jumlah	228%
Rata-rata	19%

Source: Data Management

From the table above it can be seen the results of the greatest productivity recapitulation in November and December with a total of 26% and the lowest value in January 0%. The following is a graph of productivity levels:

Figure 2 Graph of productivity levels

From the graphic image of the productivity level during January to December, it can be seen that the productivity in November and December is 26%, this is due to the 3 average criteria and this month is running smoothly. The lowest production was in January, namely 0%, this was due to the ratio 2, ratio 3 and ratio 1 which were below average.

Table 5 Recapitulation of IP to previous performance

Bulan	IP terhadap perfomasi debelumnya
Januari	0
Februari	0
Maret	0,805522
April	0,9
Mei	0,929038
Juni	0,884127
Juli	1,014695
Agustus	0,797106
September	1,014695
Oktober	0,811576
November	1,249206
Desember	0,930065

Source: Data Management

From the table above, the results of the recapitulation of the productivity index were obtained from the previous highest value in November, namely 1.249 and the lowest value in January and February, namely 0. The following is a graph of the productivity index on previous performance.

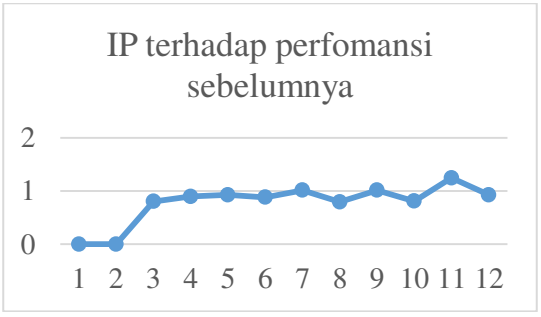

Figure 3 Graph of productivity index against previous performance

From the picture above, the graph of the productivity index against the previous dominance during January to December can show the rise and fall of a productivity. The highest index was in November and December, namely 26% and the lowest in January, namely 0%.

Table 6 Score of each criterion

Bulan	Produktivitas bahan baku (Rasio 1)	Jam kerja efektif	Efektifitas produksi (Rasio 3)

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		(Rasio 2)	
Januari	0	0	0
Februari	7	10	2
Maret	7	3	2
April	7	3	2
Mei	7	3	3
Juni	7	0	6
Juli	7	0	10
Agustus	7	0	6
September	7	0	10
Oktober	7	3	3
November	10	3	3
Desember	10	0	8
Jumlah	83	25	55

Source: Data Management

Based on the attainment of the highest score in ratio 1, namely raw materials with a score of 83, while the lowest is in ratio 2, namely effective working hours with a score of 25.

Conclusion

Based on the research conducted using the Objective Matrix (OMAX) method, the following conclusions can be drawn:

1. In the measurement above productivity during the period January to December 2022 there is a productivity of 19%, while the highest productivity occurs in November and December with a total of 26% and the lowest productivity is in January with a total of 0%.
2. The cause of decreased productivity in the production department is the lack of maintenance on machines and the lack of operator expertise in carrying out production.

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