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The Effect of Workload and Work Environment on the Performance of Injection Department Employees: A Case Study of PT. Hijau Elektronika Indonesia

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ABSTRACT

Employee performance is one of the key factors in achieving company objectives. However, performance is often influenced by various factors, including workload and work environment. Excessive or insufficient workload can reduce productivity, while an unconducive work environment may hinder comfort and work effectiveness. This study aims to determine the effect of workload and work environment on the performance of Injection section employees at PT Hijau Elektronika Indonesia. This research employed a quantitative method with a survey approach. The population consisted of all 114 female employees in the Injection section, with the sampling technique using a saturated sampling method. Data were collected through questionnaires and analyzed using validity tests, reliability tests, classical assumption tests, multiple linear regression, F-test, t-test, and the coefficient of determination (R^2) with the assistance of SPSS version 20. The results showed that workload had a positive and significant effect on employee performance (sig. 0.004 < 0.05), work environment had a positive and significant effect on employee performance (sig. 0.000 < 0.05), and both variables simultaneously had a positive and significant effect on employee performance (sig. 0.000 < 0.05). The R^2 value of 0.447 indicates that 44.7% of the variation in employee performance is explained by workload and work environment, while the remaining 55.3% is influenced by other factors. Based on these findings, the company is advised to manage workload proportionally and create a safe, comfortable, and supportive work environment, considering that the work environment is the most dominant variable affecting employee performance.

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1. INTRODUCTION

Human resource management because workers must adapt to the demands of work that are constantly changing and complex. Based on data from (Word Bank, 2024), global economic growth is projected to reach 2.6%, while Indonesia's economy is expected to grow by 5.1% in the same year, driven by increased investment and exports. This growth creates opportunities as well as challenges, especially for the electronics manufacturing sector that must respond to the continuously increasing market demand and increasingly tight global competition.

In this condition, operational efficiency and productivity improvement become crucial aspects that companies need to implement to remain relevant and competitive in the modern economic era. In this context, the manufacturing sector, especially electronics manufacturing, is required to

continuously adapt to the rapidly changing business environment due to national and global economic growth, characterized by rapid innovation and increasingly competitive market dynamics. Companies must enhance productivity and operational efficiency to remain superior in facing dynamic economic growth.

Steps such as utilizing new technology, automating production processes, and developing managerial capacity become important strategies that demand significant changes in business operations. In addition to increasing national productivity, this economic change poses new problems for human resource management because workers must be able to adjust to the constantly changing and complex job demands. Businesses in the manufacturing sector must use efficiency measures to maximize production costs alongside these economic demands. Many organizations rely on efficiency techniques to compete in the ever-changing global market today.

When designing business strategies, key considerations include cost reduction, efficiency improvement, and the use of modern technology. As a result of these efficiency measures, each operational unit is encouraged to make more significant changes to work systems and task distribution, resulting in larger production targets and work volumes. As a consequence of the efficiency challenges faced by the manufacturing sector, the latest quantitative data shows the need for serious attention to labor productivity in Indonesia. According to (CEIC Data, 2024), Indonesia's labor productivity experienced a decline of 1.55% year-on-year (YoY) in December 2024, after previously growing by 1.63% in 2023. This decline reflects obstacles in maintaining operational efficiency amid increasingly complex global and domestic economic dynamics.

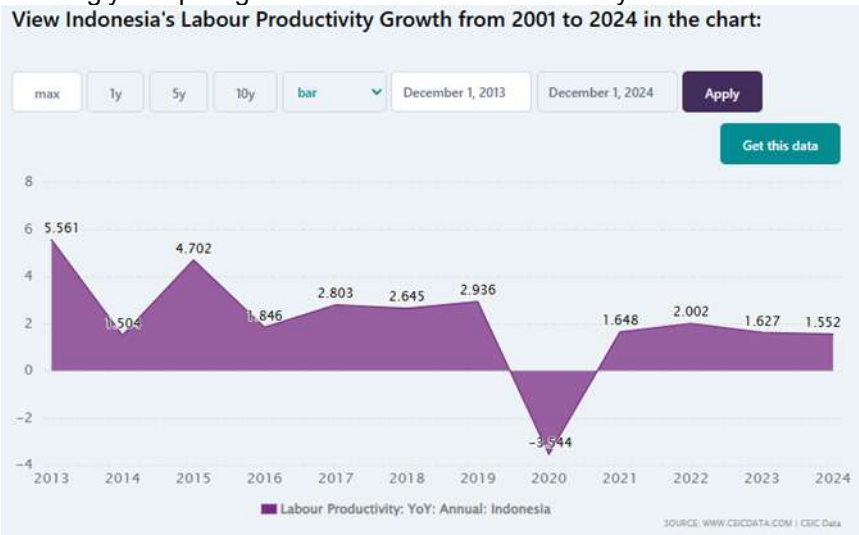

Figure 1. Labor Productivity Growth 2013 – 2024

In addition, based on data from the Ministry of Manpower in (Goodstats, 2024), throughout 2024, a total of 77,965 workers experienced layoffs (PHK) in Indonesia, with DKI Jakarta recording the highest number at 17,085 affected workers, followed by Central Java and Banten. This wave of layoffs is largely triggered by digital transformation. Automation of business processes, as well as a decrease in global demand, which indirectly also reflects the urgent need for more adaptive and sustainable efficiency strategies in the manufacturing sector.

Figure 2. Provinces with the Highest Number of Layoffs

As a continuation of the urgency of efficiency faced by the manufacturing sector in responding to global and domestic economic dynamics, along with the need to reduce production costs and increase efficiency, companies are faced with internal pressures to undertake various work efficiency efforts.

Cost-saving and resource optimization strategies have become priority agendas, leading many companies to restructure organizations, reduce process chains, and automate work. The implementation of these efficiency systems aims to increase productivity while controlling operational expenditures.

However, behind these efficiency efforts, there are unavoidable consequences, namely an increase in the workload for employees. The increased workload often arises as a direct impact of efforts to reduce costs through workforce reduction or the transfer of more complex work functions to a limited number of employees.

Thus, the emergence of efficiency as a response to economic developments and global competition also impacts the working conditions of employees in the field. As a direct implication of the implementation of efficiency strategies that demand workforce optimization, this phenomenon of increased workload has become one of the crucial challenges in the manufacturing sector.

Increased production targets, an increase in daily work volume, and demands for higher performance have made employees feel that their workload has become heavier, especially in production units such as the injection section, which must work under intense pressure.

Employee performance is also greatly determined by the work environment, in addition to the workload. Employee performance can also be influenced by a good work environment, which includes adequate facilities, ideal lighting, good ventilation, comfortable room temperature, as well as cleanliness and safety that are well maintained.

However, the importance of a supportive work environment is increasingly high along with the increasing workload. The work environment and workload have a synergistic impact on employee performance. Employees often can adapt using pressure and continue to work well as the workload increases, but the work environment also supports. On the other hand, if the increase in workload is accompanied by a decrease in workplace standards, employee performance can decline drastically. This study focuses on the relationship between workload and work environment factors and how these factors affect performance, particularly in the injection section. Furthermore, a work environment that facilitates or hinders the work process impacts employee performance in addition to the intensity of the workload. The right atmosphere, a comfortable workplace, and other elements

all contribute to a supportive work environment that sustains or even enhances employee productivity. On the other hand, a high workload can lead to significant work delays if the workplace is not suitable. This imbalance shows how the operational effectiveness of employees is greatly influenced by the alignment between their work and work environment. An important basis for improving worker performance is achieving a balance between workload and workplace quality, particularly in production lines such as the injection section. To better understand this relationship, findings from the study by (La'bi' et al., 2024a) have shown a strong correlation between employee performance and these two parameters. Research has shown that the work environment has a positive and significant impact on employee performance. This implies that the better the working conditions perceived by employees, the higher their performance levels. An appropriate and measurable workload can encourage the improvement of employee performance as much as possible, as evidenced by the positive and significant effects of workload. Simultaneously, workload and work environment factors have a substantial impact on employee performance, indicating the important role of psychological and physical components of working conditions in driving individual productivity in a manufacturing environment. These results emphasize the importance of having a positive work atmosphere and ensuring that workloads are distributed fairly to meet organizational performance goals.

PT. Hijau Elektronika Indonesia is a manufacturing company of plastic components that has been established since February 21, 2001. Founded by Mr. Lee M.G., the company is committed to providing total solutions for customers, as reflected in its vision: "Provide Total Solution for Our Customer." The main products of PT. Hijau Elektronika Indonesia include remote casings, audio parts, power outlets, vacuum cleaners, and various other electronic components. PT. Hijau Elektronika Indonesia currently operates 44 injection machines and has more than 80 employees in the injection production line, making it one of the crucial players in the national electronics industry, particularly in providing high-quality plastic components for the domestic and export markets. The injection unit at PT. Hijau Elektronika Indonesia serves as the center of production activities with a work process that involves the use of high-tech machines, quality resin or plastic pellets, and internationally standardized production systems. The production flow begins with machine planning, followed by the injection process, periodic inspections by IPQC every two hours, and ends with visual checks, burry cutting, packaging, and final inspections by OQC. The production process in this line consists of three work groups, namely (Team A, Team B, and Team C), each led by a subleader and supervised by a leader and supervisor. Unit performance is measured through indicators such as cycle time, production targets per hour, and reject rate, which in the early quarter of 2025 showed a positive trend with a decrease in reject rate from 3.06% in January to 1.38% in March.

Figure 3. Reject Rate PT. Hijau Elektronika Indonesia

Nonetheless, the workload faced by injection unit operators is considered quite high. Based on production data for the Handle Back component on machine number 27 during February 2025, the average daily production target per machine is set at 1,216 pcs per shift. This target must be consistently achieved every day, taking into account the cycle time and cavity capacity of the product. In reality, actual production results vary between 400 and 1,340 pcs per day, with the achievement ratio against the target (plan) ranging from 20% to 110%. This reflects fluctuating workload dynamics depending on machine conditions, raw material quality, and other production process constraints.

RESULT NG INJECTION FEBRUARY 2025

Tanggal	MC	Cust	Part Code	Part Name	Plan	Hasil Aktual	Ratio Plan	NG	Ratio NG	Keterangan
1-Feb	27	SDI	31000188272	Handle Back	1216	1089	90%	85	7,81%	Dirty Mold, Weldline, Undercut
2-Feb	27	SDI	31000188272	Handle Back	0	621		200	32,21%	Weldline, Oil Kering
3-Feb	27	SDI	31000188272	Handle Back	1216	244	20%	126	51,64%	Flowmark, Silver, Weldline
5-Feb	27	SDI	31000188272	Handle Back	810	856	106%	102	11,92%	Silver, Flowmark
6-Feb	27	SDI	31000188272	Handle Back	1216	1181	97%	19	1,61%	Scratch, Overcut
7-Feb	27	SDI	31000188272	Handle Back	1080	919	85%	150	16,32%	Silver
8-Feb	27	SDI	31000188272	Handle Back	1216	685	56%	257	37,52%	Flowmark, Silver, Flowmark
11-Feb	27	SDI	31000188272	Handle Back	507	400	79%	55	13,75%	Silver, Weldline
12-Feb	27	SDI	31000188272	Handle Back	1216	1050	86%	41	3,90%	Silver
13-Feb	27	SDI	31000188272	Handle Back	1080	1018	94%	22	2,16%	Silver, Overcut
14-Feb	27	SDI	31000188272	Handle Back	1216	1008	83%	32	3,17%	Silver, Scratch
15-Feb	27	SDI	31000188272	Handle Back	1216	1030	85%	63	6,12%	Silver, Scratch
16-Feb	27	SDI	31000188272	Handle Back	1216	1159	95%	34	2,93%	Silver
17-Feb	27	SDI	31000188272	Handle Back	1216	1112	91%	51	4,59%	Oil, Silver
18-Feb	27	SDI	31000188272	Handle Back	1216	1176	97%	24	2,04%	Silver, Scratch
19-Feb	27	SDI	31000188272	Handle Back	1216	1120	92%	30	2,68%	Silver, Scratch
20-Feb	27	SDI	31000188272	Handle Back	1216	1148	94%	52	4,53%	Silver
21-Feb	27	SDI	31000188272	Handle Back	1216	836	69%	76	9,09%	Dirty mold, Shortmold, Silver
22-Feb	27	SDI	31000188272	Handle Back	1216	603	50%	144	23,88%	Silver
23-Feb	27	SDI	31000188272	Handle Back	1216	1000	82%	200	20,00%	Silver
24-Feb	27	SDI	31000188272	Handle Back	1216	1159	95%	24	2,07%	Silver
25-Feb	27	SDI	31000188272	Handle Back	1216	1114	92%	59	5,30%	Silver, Oil Kering
26-Feb	27	SDI	31000188272	Handle Back	1216	1100	90%	30	2,73%	Silver
27-Feb	27	SDI	31000188272	Handle Back	1216	1340	110%	24	1,79%	Silver

Figure 4. Ratio Plan with actual production results of the Handle Back

Part In addition to the pressure to meet the daily production targets, working hour data shows that the majority of operators work between 169 – 189 hours per month, while some others reach 190 – 210 hours. The combination of quantitative workload in the form of high production targets and long working hours reflects intensive work pressure, especially with a limited team structure.The reduction in workforce due to internal efficiency, combined with the increase in output volume demanded by the company, has the potential to create work weaknesses, increased absenteeism, as well as decreased accuracy and quality of production results.

Jam Kerja Operator Injection January 2025

Jam Kerja	Total MP	%
190 - 210 jam	0 orang	0%
169 - 189 jam	78 orang	78%
148 - 168 jam	14 orang	14%
127 - 147 jam	10 orang	10%
106 - 126 jam	0 orang	0%
85 - 105 jam	0 orang	0%
64 - 84 jam	1 orang	1%
43 - 63 jam	1 orang	1%
22 - 42 jam	0 orang	0%
0 - 21 jam	0 orang	0%
Total	104 orang	104%

Jam Kerja Operator Injection February 2025

Jam Kerja	Total MP	%
190 - 210 jam	35 orang	35%
169 - 189 jam	55 orang	55%
148 - 168 jam	12 orang	12%
127 - 147 jam	3 orang	3%
106 - 126 jam	3 orang	3%
85 - 105 jam	1 orang	1%
64 - 84 jam	1 orang	1%
43 - 63 jam	1 orang	1%
22 - 42 jam	1 orang	1%
0 - 21 jam	1 orang	1%
Total	113 orang	102%

Jam Kerja Operator Injection Maret 2025

Jam Kerja	Total MP	%
190 - 210 jam	0 orang	0%
169 - 189 jam	0 orang	0%
148 - 168 jam	0 orang	0%
127 - 147 jam	0 orang	0%
106 - 126 jam	30 orang	30%
85 - 105 jam	78 orang	78%
64 - 84 jam	8 orang	8%
43 - 63 jam	0 orang	0%
22 - 42 jam	1 orang	1%
0 - 21 jam	0 orang	0%
Total	117 orang	0%

Figure 5. Total Working Hours of Injection Operators Period January – March 2025

In addition to the pressure in achieving targets, analysis of the working hours data of injection operators shows a significant workload. In February 2025, the majority of operators (55%) were recorded working within the range of 169 – 189 hours per month, while 35% were in the category of 190 – 210 hours per month. Meanwhile, 12% of the remaining worked between 148 – 168 hours, with a small proportion (less than 4%) spread across the lower working hours categories. This condition reflects the high quantitative workload faced by the workforce within a certain time frame.

Compared to January 2025, where 78% of operators were in the category of 169 – 189 hours and none reached 190 – 210 hours, there was a significant increase in the number of operators working more than 190 hours in February. However, in March 2025, the distribution of working hours shifted again, with 78% of operators in the category of 85 – 105 hours and none exceeding 148 hours. This change indicates an inconsistency in the pattern of monthly workload distribution.

It should be noted that normal working hours in Indonesia are defined as seven hours a day and forty hours a week for six working days, or eight hours a day and forty hours a week for five working days, in accordance with the provisions of Article 77 of Law No. 13 of 2003 concerning

Manpower. Thus, normal working time per month ranges from 173 to 184 hours, depending on the number of working days in that month. Therefore, the proportion of operators working more than 190 hours per month in February indicates a workload that exceeds the normal working time provisions.

The combination of high output targets and long working hours, especially in February, reflects high work pressure and has the potential to cause both physical and psychological fatigue. If not systematically addressed through appropriate human resource management, this condition can increase the risk of absenteeism, reduce work concentration, and negatively impact the quality and accuracy of production results.

To address the increasing workload, the company has added the number of operators. In January 2025, the total number of operators was 104. This number increased to 113 in February and 117 in March. However, three people resigned, leaving a total of 114 operators, divided into three shifts with 38 people per shift. This increase in workforce is expected to help reduce excessive workload and improve production efficiency.

As part of the increased workload, the temperature conditions in the injection work area have become one of the environmental factors that need attention. Based on temperature measurements using an industrial thermometer, it was recorded that the temperature in the production room reached 30°C. This data is also reflected in the temperature inspection form for February, which showed temperature fluctuations between 29°C and 30°C in the work area of PT. Hijau Elektronika Indonesia. Although the technical specifications for injection molding machines allow operation at temperatures between 0°C and 40°C, the actual temperature is above the optimal comfort level for light to moderate physical work, which ideally ranges from 24°C to 27°C. Temperatures higher than normal conditions can cause faster physical fatigue, reduce concentration, and increase the risk of work errors, especially in injection machine operations that require precision and quick coordination.

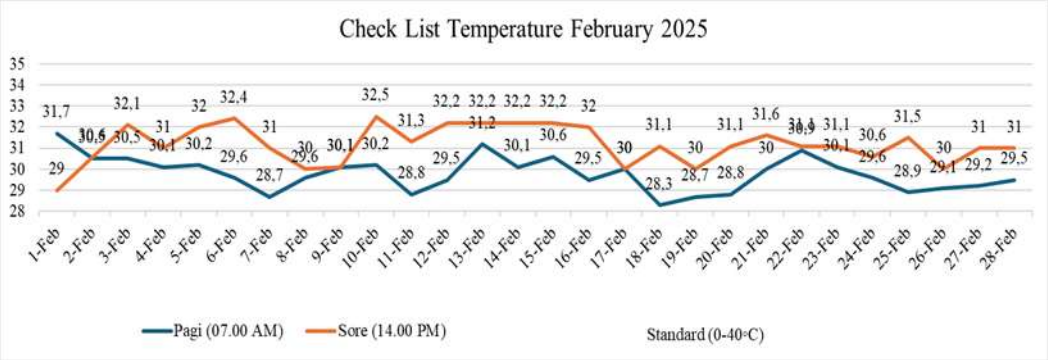

Figure 6. Daily Check Form for Temperature and Humidity, February 2025

In addition to room temperature issues, the rest facilities provided by the company have not fully supported the physical and psychological recovery of employees during working hours. Based on visual documentation of the cafeteria conditions, the facilities appear inadequate, with dirty tablecloths, narrow and limited long benches, and fans that do not function properly. These conditions fall short of the minimum comfort standards required to support effective rest periods. Consequently, employees may experience suboptimal recovery during breaks, leading to decreased post-break productivity and an increased risk of daily cumulative fatigue.

Furthermore, workplace lighting and equipment completeness were also found to pose specific environmental challenges. Field observations revealed that several operator desks lacked sufficient illumination. Based on measurements using a lux meter, the light intensity around Machine 21 was recorded at 585 lux, while Machine 18 showed 535 lux. These values fall below PT. Hijau Elektronika Indonesia's internal standards, where a single lamp should provide illumination between 1,000–2,000 lux, and two lamps between 1,000–2,800 lux. This standard also aligns with general recommendations for activities such as visual inspection and injection molding product cutting, which ideally require illumination between 750 and 1,500 lux. Additionally, several work lamps were found to be nonfunctional and had not been replaced, as indicated by red circles in the documentation images. Such inadequate lighting conditions risk reducing work visibility, increasing the potential for

operational errors, and causing eye fatigue among employees, particularly those working for extended periods.

Figure 7 Lux meter test on machines 18 and 21

In addition, work aids such as cutters and cutting pliers are mostly provided by the operators themselves, not by the company. This reflects the mismatch between the need for work tools and the support facilities provided by management. In fact, additional fans in the work area also come from the personal initiative of the operators, not from the company's facility unit, which indicates a gap between work needs and adequate physical environmental support.

Figure 8 Fans and work tools owned by operators

Furthermore, the aspect of work communication between operators and direct supervisors also becomes a significant issue in the work environment. Based on the Summary Problem data from January 2025, as well as supported by total downtime data from the Manufacturing Execution System (MES) of PT. Hijau Elektronika Indonesia, there are indications that the communication process when machine disturbances occur has not been optimal. This is evident from the high total downtime during the first three months of 2025, which amounted to 1,940 hours in January, increased to 2,176 hours in February, and although it decreased in March, it was still recorded at 1,537 hours. The high downtime figures indicate delays in handling machine disturbances, which can largely be attributed to the lack of effective communication between operators, leaders, and the maintenance team.

In fact, the company has provided tablet devices integrated with the MES system to support real-time problem reporting processes. This system not only records downtime but also provides an Andon feature to call technicians or relevant parties, as well as document the type and duration of disturbances. However, in practice, operators often hesitate to utilize the Andon feature due to concerns that the network may be problematic or that maintenance technicians may not arrive

promptly because they are handling other machines. As a result, operators prefer to leave the machine to find a technician directly rather than pressing Andon, which actually prolongs the time before repairs are made. This situation reflects a lack of trust in the available internal communication system and indicates functional barriers in the work environment.

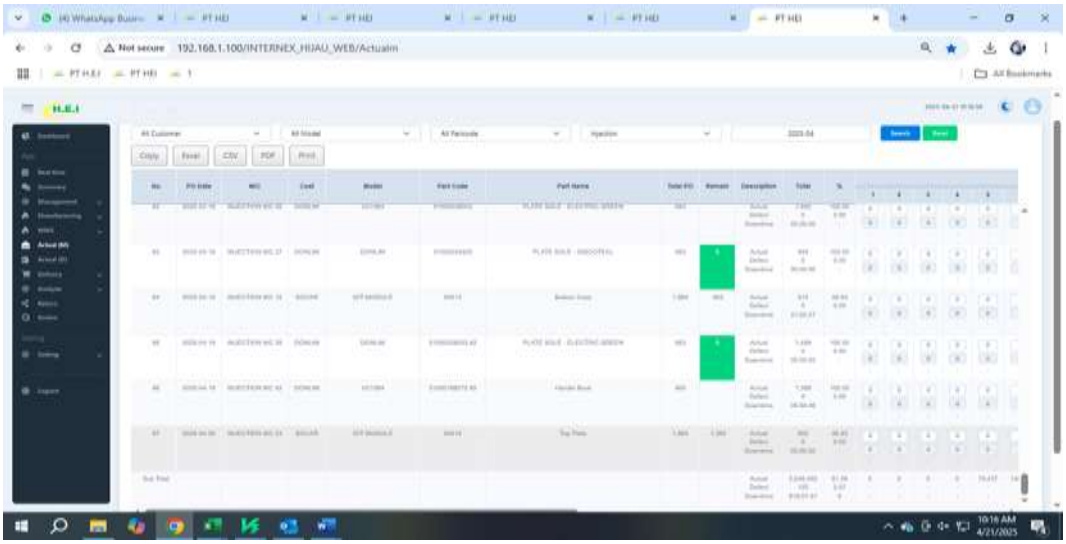

Figure 9 MES System Display of PT. Hijau Elektronika Indonesia

A work environment with a communication system that is not yet running effectively like this has the potential to hinder production efficiency, increase the likelihood of rejects, and cause a waste of time and resources. To create a more productive work environment that is responsive to technical dilemmas, it is essential to improve network infrastructure, enhance discipline in the use of the available digital communication system, and provide technical training and re-socialization regarding disruption reporting procedures.

SUMMARY PROBLEM JANUARI 2025

No	Date	DEPT.	Custom	Model	Part No	Part Name	No M.C	Shift	Plan	Hasil	TOTAL	%	Problem	Improvement	Status
7	2-Jan	INJ	OEI	B318	ODC-0962A	Holder	10	Shift 2 Shift 3	1243	0 900	900	72.41%	Start ok jam 00.00, NG Silver, Blackdot, Kontaminasi (360 ea)	start awal running cleaning and monitor	close
8	2-Jan	INJ	SDI	0	31099203740	Handle Body #2	11	Shift 1 Shift 2 Shift 3	3424	850 1071 721	2642	77.16%	Start ok jam 08.25, Robot error jam 10.08 - 10.51, Alarm part nempel, runner patah, Alarm robot part sering tidak keluar jam 03.00 - 05.50	check robot	open
9	2-Jan	INJ	OEI	B315	Semi B318	Top Case	12	Shift 1 Shift 2 Shift 3	5243	112 1590 1638	3340	63.70%	Cav 2 di blok (dented), stop jam 07.30 (repair cav 2), start jam 14.15	Mold repair	close
10	2-Jan	INJ	EMIN	H0821601	F08218A1	FRAME LAMA	14	Shift 1 Shift 2 Shift 3	4184	1310 626 1500	3436	81.93%	Short mold cav 2 & 4, cracking	setting	Monitor
11	2-Jan	INJ	OEI	B318	OHA-23088	B318 BOTTOM CASE	18	Shift 1 Shift 2 Shift 3	1997	0 54 1382	1436	71.91%	Start jam 21.15 part weld line, dimensi over, Start ok jam 22.35	start awal running adjust setting monitor	close
12	2-Jan	INJ	OEI	C013	Semi C013	Top Case	19	Shift 1 Shift 2 Shift 3	5243	988 1188 1488	3164	60.35%	MC Stop jam 07.32 (Lifter pin broken), MC Start jam 13.26, Banyak NG Whitemark, weldline, shortmold, overdimensi, shinkmark, white mark (400 ea)	Mold repair	close

Figure 10 Summary of problem injection January 2, 2025

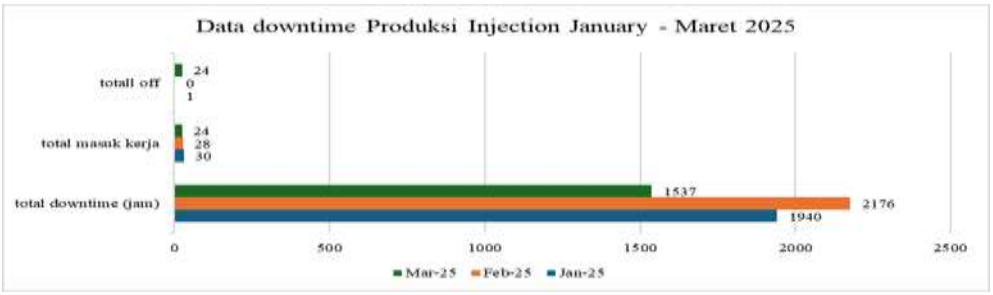

Figure 11 Graph of MES system downtime

Based on various factors, it can be concluded that the performance issues of employees at PT. Hijau Elektronika Indonesia are caused by excessive workload and an unproductive workplace. The imbalance between operational demands and actual working conditions can reduce work effectiveness and trigger negative impacts on health, job satisfaction, and product quality.

To develop a more focused improvement approach based on data that aligns with the actual field conditions, it is important for this study to measure the influence of workload and work environment on the performance of injection department employees at PT. Hijau Elektronika Indonesia. It is hoped that the conclusions of this study will assist management strategically in creating more sustainable and fair employment practices.

The influence of workload and work environment has been the subject of various previous studies in different industries. However, most of these studies were conducted in non-manufacturing companies or only examined general aspects without considering specific conditions in the production line, such as the injection unit. In addition, most previous research has not combined empirical approaches with in-depth contextual data regarding fluctuations in working hours, working room temperature, break facility conditions, to internal communication barriers as experienced at PT. Hijau Elektronika Indonesia.

By offering a new contribution in the form of a simultaneous study on workload and work environment based on actual operational conditions and comprehensive internal company data, which has not been widely disclosed in previous literature, this research aims to close this gap.

2. RESEARCH METHOD

In general, quantitative research is a methodical process that tests ideas by looking at the relationships between measurable variables using research tools and examined with statistical techniques (Creswell, 2018). A survey strategy that combines descriptive and verificative approaches is applied to the research discussed. By collecting data from samples, survey techniques are applied through obtaining quantitative or descriptive numerical data about opinions, attitudes, or characteristics of the population (Creswell, 2018).

The instrument used is a structured questionnaire, which allows measurement of the frequency distribution and relationships between variables. By using the data that has been collected as is, without changes or excessive simplifications, descriptive techniques are used to describe phenomena (Creswell, 2018). Meanwhile, to ensure whether there is a substantial relationship between independent and dependent variables, verification techniques attempt to evaluate the hypotheses that have been developed (Creswell, 2018).

To explain the relationship between variables and determine whether the proposed hypothesis is accepted or rejected through quantitative data analysis, survey techniques with a descriptive verification approach are used in this research (Creswell, 2018).

PopulationIn the context of research, the meaning of "population" aligns with the entirety of parts or people with specific characteristics related to the objectives and issues of the investigation (Creswell, 2018). The determination and mention of the population size become important aspects in research methodology, especially when the data is clearly available and can be identified. In the context of the research discussed, the population applied is the entirety of injection operators at PT. Hijau Elektronika Indonesia, totaling 114 people. Because they are directly involved in the manufacturing process, this group is chosen as the best candidate to examine how the work environment and workload affect employee performance.

SampleIn addition, the number of participants applied, including the sample and methods used to determine the sample size, must also be explained by the researcher. The determination of sample size must consider the data analysis plan, as the larger the sample size, the higher the level of accuracy in drawing conclusions (inference). However, increasing the sample size also impacts the need for more time and resources (Creswell, 2018). The sample in this research uses a non-probability sampling technique with saturated sampling, where all members of the population are included in the sample. Thus, the number of samples used in the research discussed is the entirety of injection operators at PT. Hijau Elektronika Indonesia, which is divided into three groups, with each

group consisting of 38 people, so the total number of samples in the research discussed is 114 people.

The data collection technique in this research is conducted methodically and controlled to obtain relevant information in the form of statements or numbers (Creswell, 2018). This research uses two types of data, namely primary data and secondary data. Primary data is obtained directly from the first source through interviews and questionnaires. Interviews are conducted to explore contextual information regarding the workload and work environment of employees at PT. Hijau Elektronika Indonesia, using open and unstructured interviews in the pre-research stage, as well as structured and closed interviews in the core data collection stage. Questionnaires are used to obtain quantitative data with closed instruments containing written questions measured using a five-point Likert scale, namely Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD), with weight values from 5 to 1. The data is then tabulated and analyzed through validity tests, reliability, and analysis of relationships between variables.

In addition, this research also uses secondary data as supporting sources. According to Creswell (2018), secondary data is information that has been previously collected by others for different purposes and is utilized to strengthen the research analysis. Sources of secondary data include literature studies, which are conducted by reviewing books, journals, scientific articles, research reports, and online information to obtain theoretical foundations and supporting concepts, as well as field studies conducted at PT. Hijau Elektronika Indonesia through interviews and the distribution of questionnaires to enrich understanding related to workload, work environment, and employee performance.

3. RESULTS AND DISCUSSIONS

Validity Test

The validity test aims to determine the extent to which a research instrument is able to measure what it is supposed to measure. The test is conducted by comparing the calculated r-value from the correlation between the total score of each variable with the score of each instrument, against the r-table value at a 5% significance level.

Table 1. Validity Test among Variables X1, X2, and Y

Correlations

		Workload	Work Environment	Employee Performance	Total
Workload	Pearson Correlation	1	,110	.368*	.556**
	Sig. (2-tailed)		,561	,046	,001
	N	30	30	30	30
Work Environment	Pearson Correlation	,110	1	.578**	.830**
	Sig. (2-tailed)	,561		,001	,000
	N	30	30	30	30
Employee Performance	Pearson Correlation	.368*	.578**	1	.853**
	Sig. (2-tailed)	,046	,001		,000
	N	30	30	30	30
Total	Pearson Correlation	.556**	.830**	.853**	1
	Sig. (2-tailed)	,001	,000	,000	
	N	30	30	30	30

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The calculation results show: Variable X1 (Workload) has a calculated r value of 0.556 > r table (0.374). Variable X2 (Work Environment) has a calculated r value of 0.830 > r table (0.374). Variable Y (Employee Performance) has a calculated r value of 0.853 > r table (0.374).– Since all calculated r values are greater than the r table, all instruments for variables X1, X2, and Y are declared valid. This means that the questionnaire items in the instruments are able to measure the intended concepts or variables in the study.

Reliability Test

The reliability test is conducted to determine the extent to which a research instrument provides consistent results when measured again under the same conditions.

Table 2. Reliability Test among Variables

Reliability Statistics	
Cronbach's Alpha	N of Items
,608	3

The reliability test results show that the research instrument as a whole has a Cronbach's Alpha value of 0.608, which is greater than the minimum threshold of 0.60. This indicates that the three instruments (X1, X2, and Y) have adequate internal consistency and can be used in the main study. In other words, although the instruments come from different variables, the relationships among the items within each variable remain consistent, so the measurement results are expected to be stable if the study is repeated on a similar group of respondents.

Classical Assumption Test

Normality TestThe purpose of the normality test is to determine whether the residuals of the regression model are normally distributed. One of the fundamental requirements for traditional regression analysis is the normality of residuals.

Table 3. Normality Test Results (Kolmogorov-Smirnov)

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		114
Normal Parameters[a,b]	Mean	0.00E+00
	Std. Deviation	4.47509851
Most Extreme Differences	Absolute	0.104
	Positive	0.104
	Negative	-0.066
Kolmogorov-Smirnov Z		1.111
Asymp. Sig. (2-tailed)		0.169

a. *Test distribution is Normal.*
b. *Calculated from data.*
c. *Lilliefors Significance Correction.*
d. *This is a lower bound of the true significance.*

The findings of the normality test using the One Sample Kolmogorov-Smirnov Test showed an Asymp. Sig. (2-tailed) value of 0.169. Because the significance value is greater than the significance level of 0.05 (p > 0.05), it can be concluded that the data are normally distributed. Thus, the data meet the normality assumption required for multiple linear regression analysis.

Multicollinearity Test

The aim of this test is to identify strong linear relationships between independent variables. The accuracy and stability of regression parameter estimates can be affected if multicollinearity occurs.

Table 4. Results of the Multicollinearity Test

Coefficients[a]		
Model	Collinearity Statistics	
	Tolerance	VIF

1	(Constant)		
	Workload	0.962	1.039
	Work Environment	0.962	1.039

The independent variable had a tolerance value of 0.962 and a Variance Inflation Factor (VIF) value of 1.039, according to the multicollinearity test findings in Table 4.10. Multicollinearity symptoms were not found in the regression model if the tolerance value exceeds 0.10 and is less than 10. Therefore, the variable can be used in regression analysis without causing distortion due to correlations among independent variables.

Heteroscedasticity Test

The heteroscedasticity test aims to determine whether there is inconsistency in the variance of errors (residuals) across observations in the regression model. Detection is carried out using a scatterplot between predicted values (ZPRED) and residuals (RESID). A random distribution of points without forming a pattern indicates that the model is free from heteroscedasticity symptoms.

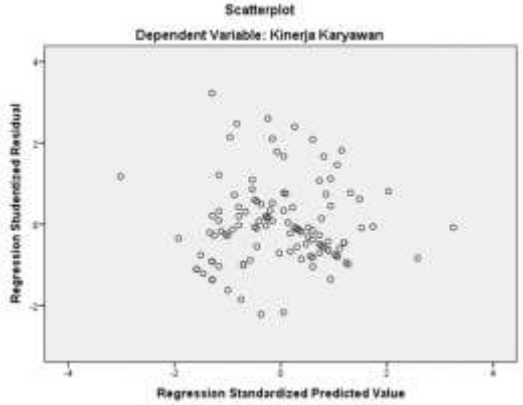

Figure 12. Heteroscedasticity Test Results (Scatterplot)

The scatterplot findings from the heteroskedasticity test indicate that the residual points are scattered randomly above and below the zero line on the Y-axis, without having a clear systematic structure. It can be concluded that this regression model does not have heteroskedasticity issues because the uneven distribution pattern indicates that the residual variance is constant across all predicted values.

Hypothesis Test

Multiple Linear Regression Analysis

Table 5. Results of Multiple Linear Regression Test

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7,642	4,649		1,644	,103
	Workload	,168	,081	,149	2,066	,041
	Work Environment	,507	,059	,623	8,656	,000
a. Dependent Variable: Employee Performance						

The results of the multiple linear regression test above yield the multiple linear regression equation, which is.

$$\mathbf{Y = a + b1.X1 + b2.X2 + e}$$

$$Y = 7{,}642 + 0{,}168\ (X1) + 0{,}507\ (X2)$$

The multiple linear regression model indicates that the constant value of 7.642 signifies that if all independent variables are assumed to have no effect or are valued at zero (X = 0), the Employee Performance score would remain at 7.642. This shows that even without the influence of Workload and Work Environment, employee performance maintains a baseline level. The regression coefficient for the Workload variable (X1) is 0.168, meaning that an increase in Workload for one respondent, while other factors remain constant, would lead to an estimated increase of 0.168 in Employee Performance. Meanwhile, the regression coefficient for the Work Environment variable (X2) is 0.507, indicating that an improvement in Work Environment for one respondent, with others unchanged, would raise Employee Performance by 0.507. The simultaneous hypothesis test (F-test) further examines whether both independent variables significantly affect the dependent variable together. If the significance value is less than 0.05 or the Fcount is greater than the Ftable, it means that Workload and Work Environment jointly have a significant effect on Employee Performance, leading to the rejection of H_0 and acceptance of H_1. Conversely, if the significance value is greater than 0.05 or the Fcount is smaller than the Ftable, it implies that both variables do not simultaneously influence Employee Performance, resulting in the acceptance of H_0 and rejection of H_1.

Simultaneous Test (F Test)

Table 6. Results of the Simultaneous Test or F Test

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1826,022	2	913,011	44,783	.000[b]
	Residual	2262,995	111	20,387		
	Total	4089,018	113			
a. Dependent Variable: Employee Performance						
b. Predictors: (Constant), Work Environment, Workload						

Nilai signifikan pengaruhnya Workload (X1) serta Work Environment (X2) terhadap kinerja pegawai (Y) adalah 0,000 < 0,05 dan f hitung 44,783 > nilai f tabel 3,08, sesuai dengan tabel 4.17 Temuan Uji Simultan atau Uji f. Perihal tersebut menunjukkannya jika H_0 ditolak serta H3 diterimakan, dengan berartikan kinerja pegawai (Y) dipengaruhinya bersignifikan dari Workload (X1) dan Work Environment (X2).

Partial Test (t-Test)

The t-test is applied to assess whether there is a significant relationship between the independent variables, Workload and Work Environment, which may have a partial (separate) effect on the dependent variable, Employee Performance. The following are the requirements for the t-test or partial test.

Table 7. Results of the Partial Test (t-Test) X1

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	33,900	4,539		7,469	,000
	Workload	,306	,103	,270	2,969	,004
a. Dependent Variable: Employee Performance						

The table above shows that the effect of Workload (X1) on Employee Performance (Y) is 0.004 < 0.05, with a calculated t-value of 2.969 > the table t-value of 1.981. Therefore, H0 is rejected and H1 is accepted. This indicates that Workload has a significant effect on Employee Performance.

Table 8. Partial Test Results (t-Test) X2

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	13,506	3,735		3,616	,000
	Work Environment	,531	,058	,652	9,104	,000
a. Dependent Variable: Employee Performance						

The table shows that the effect of Work Environment (X2) on Employee Performance (Y) is 0.000 < 0.05, with a calculated t-value of 9.104 > table t-value of 1.981. Therefore, H0 is rejected and H1 is accepted. This indicates that Workload has a significant effect on Employee Performance.

Coefficient of Determination Test (R2)

Referring to Ghozali (2018), the coefficient of determination test is conducted to assess the extent to which a regression model can explain the variations occurring in the dependent variable (Y). The value of the coefficient of determination ranges from 0 to 1.

Table 9. Results of the Coefficient of Determination Test (R2)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.668[a]	,447	,437	4,51523
a. Predictors: (Constant), Work Environment, Workload				

Based on Table 4.16, the result of the coefficient of determination test obtained an R Square value of 0.447. This indicates that 44.7% of the variation occurring in the Employee Performance variable is explained by the Workload and Work Environment variables as independent variables. Meanwhile, the remaining 55.3% is accounted for by other factors not included in the regression model and not examined in this study. Thus, this model has a moderate ability to explain the influence of the independent variables on the dependent variable.

4. CONCLUSION

Based on the results of multiple linear regression analysis and hypothesis testing, this study concludes that Workload and Work Environment have a positive and significant effect on Employee Performance in the Injection Department at PT. Hijau Elektronika Indonesia, both partially and simultaneously. Employee Performance increases when Workload is proportionally managed and the Work Environment is well maintained, with Work Environment proven to be the most dominant factor in enhancing motivation and productivity. Therefore, the company is advised to regularly review workload distribution, improve the quality of the work environment, and consider other factors such as training, compensation, and leadership style to further enhance Employee Performance. For academics and future researchers, it is recommended to include additional variables such as motivation, leadership, or organizational culture, expand the research scope to other departments or similar companies, and apply qualitative or mixed-method approaches to gain a more comprehensive understanding of the factors influencing Employee Performance.

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