

## The Effect of Technology Management and Raw Material Inventory Management on Production Efficiency at CV Nilani Global Sumatera

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Abstract	Article Info
<p>This study aims to examine the influence of technology management and raw material inventory management on production efficiency at CV. Nilani Global Sumatera. A quantitative research method was employed using multiple regression analysis to determine both partial and simultaneous effects of the independent variables on production efficiency. The findings reveal that technology management has a significant positive effect on production efficiency, as indicated by a t-value of 3.632, which exceeds the t-table value of 1.9861, with a significance level of <math>0.000 &lt; 0.05</math>. Similarly, raw material inventory management also exerts a significant positive influence on production efficiency, supported by a t-value of <math>4.126 &gt; 1.9861</math> and a significance level of <math>0.001 &lt; 0.05</math>. Furthermore, the simultaneous F-test results demonstrate that both factors collectively have a significant impact on production efficiency, as evidenced by the significance value of <math>0.000 &lt; 0.05</math>. These results imply that the effective integration of technological systems and efficient inventory control can enhance productivity, minimize operational costs, and streamline production processes. This research contributes to the field of production and operations management by providing empirical evidence on how strategic technology management and optimized raw material inventory practices jointly improve production efficiency. The findings can serve as a reference for manufacturing enterprises seeking to enhance operational performance through better resource utilization and technology-driven process improvement.</p>	<p><b>Article History</b>  <i>Received :</i>  <i>August 10, 2025</i>  <i>Revised :</i>  <i>October 16, 2025</i>  <i>Accepted :</i>  <i>November 09, 2025</i></p> <p><b>Keywords:</b>  <i>Technology Management, Raw Material Inventory, Production Efficiency</i></p>
<p>Published by Yayasan Payungi Smart Madani            ISSN 2776-4303            Website <a href="https://journal.payungi.org/index.php/ijcep">https://journal.payungi.org/index.php/ijcep</a>            This is an open access article under the CC BY SA license  <a href="https://creativecommons.org/licenses/by-sa/4.0/">https://creativecommons.org/licenses/by-sa/4.0/</a></p> 	

### INTRODUCTION

In the current era of globalisation and digitalisation, the industrial world is required to continuously adapt to rapid changes in technology, human resources, and operational systems. One crucial aspect in the business world, especially in the production sector, is a company's ability to manage its production processes efficiently. Production efficiency not only reflects how much output can be generated from a given input, but also demonstrates a company's ability to minimise waste, manage production time, and optimise resource utilisation. This is important given the high level of competition between companies in various business sectors today (Utami, 2021).

One factor that affects production efficiency is technology management. Technology management includes the process of identifying, planning, developing, and implementing technology that suits the company's operational needs. In the industrial context, technology plays an important role in increasing productivity, accelerating the production process, reducing human error, and improving the quality of production. However, improper technology management can actually cause losses, such as high maintenance costs, tool malfunctions, or

even idle time that hinders the production process. Therefore, companies are required not only to adopt technology but also to be able to manage it strategically and in an integrated manner (Lestari & Sari, 2023).

In addition to technology, the management of raw material supplies is also a key factor in supporting the success of the production process. Raw materials are the main input in production activities. When the availability of raw materials is not guaranteed or managed inefficiently, various problems will arise, such as production delays, excess stock, accumulation in warehouses, increased storage costs, and even the potential for damage to materials before use.

Conversely, with good inventory management, companies can regulate ordering times, the amount of materials needed, and avoid stockouts that can disrupt production (Yuliana & Prasetyo, 2022). The integration of technology management and good inventory management is believed to significantly create production efficiency. This is supported by earlier research by Wijaya (2021), which found that companies that have successfully combined technology-based inventory management systems have experienced a 20–30% increase in efficiency in their production processes. (Khairina, 2019)

**Table 1. Raw Material Inventory Data for CV. Nilani Global Sumatera in 2024**

Month	Initial Inventory (kg)	Purchases (kg)	Usage (kg)	Ending Inventory (kg)
January	10	5	12	3
February	3	7	8.5	1.5
March	1.5	10	9	2.5
April	2.5	6	7	1.5
May	1.5	8	7.5	2
June	2	9	10	1
July	1	8.5	8	1.5
August	1.5	9	9.5	1
September	1	7	7.2	800
October	800	8	7.5	1.3
November	1.3	6.5	7	800
December	800	7	6.5	1.3
<b>Total</b>	-	<b>91</b>	<b>99.7</b>	-

From the raw material inventory data table above, it can be seen that CV. Nilani Global Sumatera records and manages its inventory periodically every month during the current year. The table shows that there are fluctuations in the amount of raw materials received, used, and remaining in the warehouse from month to month. For example, in January, the company received 5,000 kg of raw materials, used 4,200 kg for the production process, leaving 800 kg as ending inventory. A similar trend can be seen in the following months, although the amount of raw materials received and used varied. This indicates that production requirements are not always stable and are influenced by market demand or production capacity.

Well-recorded inventory management like this is very important in supporting production efficiency. If raw materials are procured in a timely manner and according to demand, the production process will not be hampered by a shortage of raw materials. Conversely, if there is too much unused stock, it can lead to wasteful storage costs and the risk of raw materials expiring or deteriorating. The data also shows that good inventory management, when combined with the use of appropriate technology management, will greatly

support the company's production efficiency in terms of cost, time, and production quality. (Nurbaiti, 2022)

Technology also enables companies to record raw materials in real time, forecast material requirements, and monitor production processes systematically and automatically. CV. Nilani Global Sumatera is a company engaged in the production and distribution of local products from raw materials for pipe manufacturing, particularly consumer and processed products. This company shows great potential for growth because it has a large market and competitive products. Then from observations and initial interviews with management, it is known that the company still experiences several obstacles in its production process. One of the main obstacles is the suboptimal use of technology in production activities and the absence of an integrated system for managing raw material supplies. These problems have led to inefficient production times, waste of materials, and a mismatch between production times and market demand.

In some cases, the company also experiences raw material shortages, which directly impact the delay in the production process and product delivery to consumers. This can certainly reduce customer satisfaction and affect the company's image in the eyes of the market. From these issues, it is important to examine more deeply how technology management and raw material inventory management affect production efficiency at CV. Nilani Global Sumatera. This research aims not only to identify existing problems but also to provide strategic recommendations that can be implemented by the company in the short and long term.

Theoretically, this research enriches the literature on operational management, particularly in terms of the influence of technology and inventory on production efficiency. Meanwhile, in practical terms, it is anticipated that the study's findings will offer the business useful and effective remedies, thereby increasing its productivity and competitiveness amid increasingly fierce industry competition. A similar study conducted by Santosa (2020) also reinforces the urgency of this topic. He concluded that production efficiency is greatly influenced by coordination between technology systems and good raw material logistics management. Therefore, by conducting an empirical analysis at CV. Nilani Global Sumatera, it is hoped that a more concrete picture of the relationship between these three variables, namely technology management, raw material management, and production efficiency, can be obtained.

## **LITERATURE REVIEW**

### **Grand Theory: Operations Management Theory**

Operations Management Theory emphasises the effective and efficient management of resources to achieve optimal production goals. From this perspective, technology management and raw material inventory management are important parts of the operational process that affect production efficiency.

Relationship Between Variables Technology Management and Production Efficiency From operations management theory, technology is one of the key factors in increasing productivity. Henri Fayol emphasises the importance of planning and organising in managing technology to align with organisational goals. The right technology can speed up processes, reduce errors, and minimise waste of time and resources, thereby increasing production efficiency.

Raw Material Inventory Management and Production Efficiency Operations management theory also highlights the importance of inventory management. According to Heizer & Render (2017), good inventory management ensures that raw materials are available at the right time, in the right quantity, and of the right quality. Poor management can lead to stockouts or overstocking, which results in wasted costs and time, thereby reducing production efficiency.

Technology Management + Raw Material Inventory Management with Production Efficiency These two factors complement each other: technology helps speed up processes and maintain quality. Inventory management ensures that the required raw materials are always

available. If both are managed optimally, the production process will run more smoothly, with minimal obstacles, and efficiently. (Nurbaiti, 2023)

### **Production Efficiency**

Production efficiency is a fundamental aspect in determining the competitiveness and sustainability of a company, especially in facing increasingly competitive market dynamics. In general, production efficiency is defined as the ability of a business entity to produce maximum output with minimal input. This reflects the company's ability to optimise all of its resources including labour, raw materials, time, and technology so that the production process runs effectively, productively, and at low cost.

According to Lestari and Sari (2023), production efficiency is not merely a technical measure, but also a key indicator of a company's overall operational performance. A high degree of efficiency shows that the business can effectively manage its resources, which directly affects lowering manufacturing costs, raising customer happiness, and enhancing product quality. Long-term, high efficiency also boosts competitiveness and solidifies the company's place in the market, particularly for small and medium-sized businesses that struggle with a lack of funding and human capital. For small and medium-sized businesses (SMIs), production efficiency is frequently a significant obstacle. Technological limitations, lack of workforce training, and suboptimal raw material management are the main obstacles to achieving the expected efficiency.

Utami (2021) emphasises that two key factors that greatly influence production efficiency in SMIs are technology management and raw material management. The application of appropriate technology can accelerate the production process and minimise human error, while good raw material management can reduce waste and ensure the availability of materials according to production needs.

To measure the level of production efficiency, there are several important indicators that can be used as a reference.

1. Output productivity against input, which is the ratio between the number of products produced and the amount of resources used, whether in the form of materials, labour, or time. The greater the output produced with the same input, the higher the level of production efficiency.
2. Production cost savings, which describe the company's ability to reduce costs without compromising product quality. Cost efficiency demonstrates management's ability to manage resources economically and strategically.
3. Production timeliness, which refers to the extent to which the production process can be completed on schedule and meet market demand. Timeliness not only reflects operational efficiency, but also determines the company's reliability in fulfilling its commitments to consumers.
4. The level of waste, which is an important indicator in evaluating the quality of the production process. The lower the number of failed products or waste produced, the higher the level of efficiency.

Santosa (2020) emphasises that these four indicators are interrelated and serve as benchmarks for the effectiveness of a company's operational planning. In other words, production efficiency is not merely a quantitative achievement in the form of increased output, but also encompasses management quality, process control, and the company's ability to adapt to changes in the business environment. For the SME sector, improving production efficiency can be the main foundation for sustainable growth, increasing profits, and expanding market share amid limited resources.

### **Technology Management**

Technology management is the process of planning, developing, implementing, and evaluating the technology used in a company's operational activities to improve competitiveness and efficiency. Properly managed technology can help accelerate production processes, reduce costs, and improve product quality (Utami, 2021).

According to Wijaya (2021), technology management does not only focus on the tools and machines used, but also on the decision-making process in selecting, modifying, and implementing these technologies so that they are in line with the company's business strategy. Technology management must also pay attention to the ability of human resources to operate and maintain the technology used. (Isnaini, 2022)

Technology Management Indicators (adapted from empirical literature):

1. Technology Planning, covers the company's strategy and readiness in adopting new technology.
2. Technology Utilisation in the Production Process, how technology is used in the production stage to support work efficiency.
3. Technology Development and Innovation, includes periodic updates to systems or tools to improve efficiency.
4. Human Resource Capability in Managing Technology, the extent to which the workforce understands, operates, and maintains production technology.

By applying these indicators, companies can assess the extent to which the technology used has contributed to the overall business process (Lestari & Sari, 2023).

### **Raw Material Inventory Management**

Raw material inventory management is an activity related to the planning, procurement, storage, and distribution of raw materials so that production activities can run smoothly. A poor inventory system can cause production delays, high storage costs, or even losses due to damaged raw materials (Yuliana & Prasetyo, 2022).

Good inventory management focuses not only on the amount of stock available, but also on data accuracy, ordering time efficiency, and integration between production demand and material availability. According to Santosa (2020), companies need to have an integrated inventory monitoring system in order to make timely ordering decisions.

Raw Material Inventory Management Indicators: (Marliyah 2023)

1. Raw Material Inventory Planning, how accurately the company determines the quantity and timing of material procurement.
2. Raw Material Procurement, efficiency in the purchasing process and cooperation with suppliers.
3. Storage and Inventory Control, includes warehouse layout, stock recording, and raw material supervision.
4. Inventory Information System, availability of systems or applications to record and monitor raw materials in real time.

Proper inventory management has been proven to minimise costs and streamline production processes, especially in raw material-based industries such as CV. Nilani Global Sumatera (Wijaya, 2021).

### **The Relationship Between Technology Management and Raw Material Inventory Management with Production Efficiency**

The relationship between technology management and raw material inventory management with production efficiency is closely related and mutually supportive in creating optimal operational performance. From various research results and empirical studies, these two aspects can be considered the main foundations for increasing productivity and reducing production costs, especially in the small and medium-sized industry (IKM) sector, which has limited resources. Technology management plays an important role in ensuring that the production process runs effectively and efficiently. The application of appropriate technology not only speeds up the work process, but also reduces human error, lowers operational costs, and improves product quality consistency. Technology also enables companies to automate, control quality, and monitor the production process in real time.

Thus, the implementation of good technology management can improve workflow, save time, and increase output productivity relative to the inputs used. On the other hand, raw material inventory management also has a direct impact on production efficiency. Proper

management allows companies to maintain a balance between raw material availability and demand. If there are too few raw materials, the production process can be hampered and cause delays, while if there are too many, it will lead to waste and increase storage costs. Therefore, a good inventory management system such as the use of the first in first out (FIFO) method, economic order quantity (EOQ), or the implementation of a digital inventory system can help companies control stock efficiently and support smooth production processes. Thus, it can be concluded that technology management and raw material management are two complementary components in improving production efficiency. The application of appropriate technology will facilitate the process of monitoring and controlling raw materials, while effective raw material management will support the maximum utilisation of technology. These two factors, if well integrated, will create a production system that is faster, more cost-effective, minimises waste, and is capable of producing high-quality products in line with market needs.

## METHOD

This research method uses an associative quantitative approach to analyse the relationship and influence of technology management and raw material inventory management on production efficiency. This approach was chosen because it allows for statistical testing of hypotheses through numerical data collected using questionnaires (Sugiyono, 2022). The research was conducted at CV. Nilani Global Sumatera in Medan City, North Sumatra, during the period of July–August 2025.

The research population consisted of all 40 employees in the production and logistics departments. Because the population was relatively small, a saturated sampling technique (census) was used so that the entire population was included in the sample. A closed-ended questionnaire with a Likert scale (1–5) was used to collect primary data, and documentation studies were used to gather secondary data. To guarantee the quality of the instruments, validity (Pearson Product Moment) and reliability (Cronbach's Alpha  $\geq 0.7$ ) tests were performed before complete distribution (Ghozali, 2018). Multiple linear regression analysis, the t-test (partial effect), the F-test (simultaneous effect of), the coefficient of determination (R<sup>2</sup>), and the classical assumption tests (normality, multicollinearity, and heteroscedasticity) were all used in the data analysis, which was carried out using SPSS (Daim, 2021).

## RESULT AND DISCUSSION

### Descriptive Analysis

**Table 1 Descriptive Analysis**

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Manajemen Tekonologi	40	8.00	21.00	14.6000	2.89828
Pengelolaan Persediaan Bahan Baku	40	6.00	21.00	14.0000	3.45669
Efisiensi Produksi	40	7.00	23.00	15.0000	3.82301
Valid N (listwise)	40				

Technology Management has a minimum value of 8.00, a maximum of 21.00, a mean of 14.60, and a standard deviation of 2.89828. This mean value indicates that the level of technology management implementation among respondents is in the fairly good to good category, with relatively moderate variation in respondents' answers (standard deviation is not too high).

Raw Material Inventory Management has a minimum score of 6.00 and a maximum score of 21.00, with an average of 14.00 and a standard deviation of 3.45669. This indicates that the respondents' or companies' ability to manage raw material inventory is in the fairly good category, although the variation in responses is slightly greater than for the technology

management variable, meaning that the level of inventory management varies among respondents.

Production Efficiency shows a minimum value of 7.00, a maximum of 23.00, with an average of 15.00 and a standard deviation of 3.82301. This average indicates that the level of production efficiency is in the fairly good category, but has the greatest variation among the three variables, indicating that there are quite large differences in the achievement of production efficiency among respondents. In general, the three variables have fairly balanced averages in the range of 14-15, indicating that the implementation of technology management, raw material inventory management, and production efficiency tend to be at a fairly optimal level. The variation in values (standard deviation), which is still in the moderate category, indicates that the differences between respondents are not too extreme, but there is still room for improvement in the consistency of the implementation of these three aspects.

#### Validity Test

To ascertain the degree of correctness, a significance test was performed by comparing the estimated r value with the table r value. In this case, the degree of freedom (df) is equal to n-k, where n is the number of samples and k is the number of constructs. A question item is deemed legitimate if the calculated r (which is shown in the total correlation of the rectified question items) is greater than the table r and the r value is positive. In this instance, a table r of 0 can be obtained by computing the df as 40-1 or df = 39 with an alpha of 0.05.

**Table 2 Validity Test Results**

Variable	Question Item	Total Correlation	R Table	Description
Technology Management (X1)	X1.1	0.335	0.2006	Valid
	X1.2	0.303	0.2006	Valid
	X1.3	0.424	0.2006	Valid
	X1.4	0.588	0.2006	Valid
	X1.5	0.367	0.2006	Valid
Raw Material Inventory Management (X2)	X2.1	0.446	0.2006	Valid
	X2.2	0.593	0.2006	Valid
	X2.3	0.693	0.2006	Valid
	X2.4	0.964	0.2006	Valid
	X2.5	0.720	0.2006	Valid
Production efficiency (Y)	Y.1	0.541	0.2006	Valid
	Y.2	0.470	0.2006	Valid
	Y.3	0.408	0.2006	Valid
	Y.4	0.631	0.2006	Valid
	Y.5	0.758	0.2006	Valid

According to the table above, each question item has a positive calculated r value that is higher than the table r value (0.2006). Thus, the survey is regarded as legitimate.

#### Reliability Test

The purpose of the reliability test is to evaluate respondents' consistency and dependability when responding to questionnaire-style questions. The test results will indicate whether or not a learning tool is reliable from the degree of accuracy and stability of a measurement device. The standards by which a research instrument's dependability or unreliability is evaluated. Comparing the computed and table values at a 95% transparency level (meaning 5% significance) is one of them. The calculation will show the Alpha value in the following table if the test is carried out using the Cronbach's Alpha method:

**Table 3 Reliability Test Results**

Reliability Test	Reliability Coefficient	Cronbach Alpha	Description
Technology Management Variable	5 Questions	0.896	Reliable
Raw Material Inventory Variable	5 Questions	0.810	Reliable
Production Efficiency Variable	5 Questions	0.741	Reliable

Each variable has a Cronbach Alpha > 0.60, as seen in the summary table above. Various variables (Technology Management, Raw Material Inventory, and Production Efficiency) can be considered reliable.

**Classical Assumption Test**  
**Normality Test**

Finding out if the dependent and independent variables in the regression model are regularly distributed is the goal of the normality test. You may ascertain whether the data is normal by using the Normal P-P Plot and looking at the distribution of the data. If the distribution of the data on the graph displays a straight line pattern, the data is said to be normal. A Kolmogorov-Smirnov sig value greater than 0.05 indicates that the normality test table is normally distributed. The following is the normality test for the study:

**Table 4 Normalcy Test Results**

**One-Sample Kolmogorov-Smirnov Test**

		Standardized Residual
N		40
Normal Parameters <sup>a,b</sup>	Mean	.0000000
	Std. Deviation	.97402153
Most Extreme Differences	Absolute	.066
	Positive	.066
	Negative	-.056
Kolmogorov-Smirnov Z		.419
Asymp. Sig. (2-tailed)		.995

a. Test distribution is Normal.

b. Calculated from data.

From the results of the normality test for all variables using the Kolmogorov-Smirnov calculation above, which is 0.995 and higher than 0.05, it can be concluded that the variable data is normally distributed.

**Multicollinearity Test**

Finding a meaningful link (correlation) between independent variables is the goal of the multicollinearity test. The Coefficient table displays the results of the multicollinearity test using SPSS, namely in the Tolerance and VIF (Variance Inflated Factors) columns. How much of an independent variable's fluctuation cannot be accounted for by other independent variables is shown by its tolerance. Multicollinearity is absent if the tolerance value is higher than 10.10 and the VIF value is lower than 10.00.

**Table 5 Multicollinearity Test Results**

Coefficients <sup>a</sup>											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	12.946	3.929		3.295	.002					
	Manajemen Teknologi	.134	.217	.101	3.617	.000	.102	.101	.101	.992	1.075
	Pengelolaan Persediaan	.007	.182	.007	4.041	.000	.016	.007	.007	.992	1.479

a. Dependent Variable: Bahan Baku

From the results of the multicollinearity test, it is known that the inflation factor (VIF) variable for the Technology Management variable (X1) is 1.075, while for the Raw Material Inventory Management variable it is 1.479. The results obtained from these two variables are less than 10, so it can be assumed that there is no multicollinearity between the independent variables in the regression model.

**Heteroscedasticity Test**

The heteroscedasticity test is used to determine whether the disturbance errors of a linear regression model have the same variance from one observation to the next. The Glejser test is used to test the assumptions in this exploration.

**Table 6 Heteroscedasticity Test Results**

Coefficients <sup>a</sup>											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3.624	2.221		1.631	.111					
	Manajemen Teknologi	.034	.122	.046	.281	.780	.034	.046	.046	.989	1.011
	Pengelolaan Persediaan Bahan Baku	-.061	.088	-.113	-.691	.494	-.109	-.113	-.113	.989	1.011

a. Dependent Variable: Abs\_RES

From the table, it can be seen that the significance value for Technology Management is 0.780, and for Raw Material Inventory Management is 0.494. Since these values are greater than 0.05, it can be concluded that there is no heteroscedasticity problem in this research.

**Hypothesis Testing**

**R Square Test**

The coefficient of determination or R2 test aims to determine the extent to which the independent/free variable explains the dependent/bound variable or to determine the percentage of bound variation explained by the free variable.

**Table 7 R Square Test Results**

Model Summary <sup>b</sup>										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.604 <sup>a</sup>	.601	.503	3.90373	.011	.202	2	37	.818	2.047

a. Predictors: (Constant), Pengelolaan Persediaan Bahan Baku, Manajemen Teknologi

b. Dependent Variable: Efisiensi Produksi

The results of the coefficient of determination test show that 60.1% of the influence of Technology Management and Raw Material Inventory Management on Production Efficiency at CV. Nilani Global Sumatera.

**T-Statistic Test**

The t-test aims to determine whether the independent variable, or the influence of Technology Management and Raw Material Inventory Management on Production Efficiency at CV. Nilani Global Sumatera, is significant.

**Table 8 Hypothesis Test Results**

		Coefficients <sup>a</sup>									
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	12.946	3.929		3.295	.002					
	Manajemen Teknologi	.134	.217	.101	3.617	.000	.102	.101	.101	.992	1.075
	Pengelolaan Persediaan	.007	.182	.007	4.041	.000	.016	.007	.007	.992	1.479

a. Dependent Variable: Bahan Baku

From Table 8 above, the results of the equation model for the variable of the influence of technology management and raw material inventory management on production efficiency at CV. Nilani Global Sumatera Utara are as follows:

$$Y = 12.946 + 0.134 (X1) + 0.007 (X2) + e$$

From the equation results obtained, the meaning and significance of the coefficients of the Influence of Technology Management and Raw Material Inventory Management on Production Efficiency at CV. Nilani Global Sumatera are as follows:

1. The constant value (c) is 12.946, which means that if the variables of Technology Management and Raw Material Inventory Management are equal to zero, then the Production Efficiency at CV. Nilani Global Sumatera is equal to 12.946, assuming that other variables remain constant.
2. Technology Management (X1) 0.134 means that if the independent variable, Technology Management, increases by 1%, it will increase Production Efficiency by 0.134%.
3. Raw Material Inventory Management (X2) 0.007. This means that if the independent variable, Raw Material Inventory Management, increases by 1%, it will increase Production Efficiency by 0.007%.

The statistical values are as follows:

1. Technology Management (X1) has a t-value of 3.617. This value is smaller than the t-table value (1.9861) with a t-sig value (0.000) < 0.05. Therefore, the research hypothesis test is Haaccepted and H0rejected. This explains that Technology Management partially influences Production Efficiency at CV. Nilani Global Sumatera.
2. Raw Material Inventory Management (X2) has a t-value of 4.041. This value is smaller than the t-table value (1.9861) with a t-sig value (0.000) < 0.05. Therefore, the research hypothesis testing is Haaccepted and H0rejected. This explains that, partially, Raw Material Inventory Management affects Production Efficiency at CV. Nilani Global Sumatera.

**F-Statistic Test**

The F test was conducted to see whether the independent variables simultaneously have an effect on the dependent variable.

**Table 9 F-Statistic Test Results**

		ANOVA <sup>b</sup>				
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.153	2	3.077	.000	15.818 <sup>a</sup>
	Residual	563.847	37	15.239		
	Total	570.000	39			

a. Predictors: (Constant), Pengelolaan Persediaan Bahan Baku, Manajemen Teknologi

b. Dependent Variable: Efisiensi Produksi

The F-statistic test result has a value of 0.000, which explains that simultaneously, Technology Management and Raw Material Inventory Management have an effect on Production Efficiency at CV. Nilani Global Sumatera.

## **RESEARCH DISCUSSION**

### **The Effect of Technology Management and Raw Material Inventory Management on Production Efficiency**

From the F test results, a significance value of 0.000 was obtained, which is smaller than the probability value of 0.05. This indicates that simultaneously, the variables of Technology Management (X1) and Raw Material Inventory Management (X2) have a significant effect on Production Efficiency (Y) at CV. Nilani Global Sumatera. Thus, the alternative hypothesis (Ha) is accepted, while the null hypothesis (H0) is rejected.

Simultaneously, the integration of technology management and raw material inventory management forms an efficient production system. When technology supports real-time processing of information about raw material requirements and production schedules, coordination between departments within the company becomes more synchronised. This is called operational synergy, where two systems reinforce each other. In this context, open system theory is also relevant, as companies cannot stand alone without dynamic interactions between their components (input-process-output). Technology management and raw material management as subsystems greatly influence the production process as the main system in producing quality output efficiently.

### **The Influence of Technology Management on Production Efficiency**

From the t-test results, a t-value of 3.617 was obtained, which is greater than the t-table value of 1.9861, with a significance level of  $0.000 < 0.05$ . Therefore, it can be concluded that Ha is accepted and H0 is rejected, meaning that technology management partially has a significant effect on production efficiency at CV. Nilani Global Sumatera.

Theoretically, technology management is a strategic process that manages the planning, development, implementation, and evaluation of technology in a company's production or operational processes (Narayanan, 2001). Well-managed technology can optimise production time, reduce error rates, and increase labour productivity and product quality. The results of this research are in line with Sihotang's (2019) opinion, which states that the application of appropriate technology can increase production efficiency by minimising time and cost waste. With good technology management, companies are able to carry out production processes more quickly, accurately, and cost-effectively. Interrelationship between Variables Technology Management and Production Efficiency From operations management theory, technology is one of the key factors in increasing productivity. Henri Fayol emphasised the importance of planning and organising in managing technology to align with organisational goals. The right technology can speed up processes, reduce errors, and minimise waste of time and resources, thereby increasing production efficiency. In the context of CV. Nilani Global Sumatera, technology management most likely includes the selection of efficient production equipment, the utilisation of production information systems, and the training of workers to operate technology optimally. These factors contribute significantly to the achievement of production efficiency, such as reducing production costs per unit and increasing daily output.

### **The Effect of Raw Material Inventory Management on Production Efficiency**

The t-test results also show that raw material inventory management has a t-value of 4.041, which is greater than the t-table value of 1.9861, with a significance value of  $0.000 < 0.05$ . Thus, Ha is accepted and H0 is rejected, meaning that raw material inventory management partially has a significant effect on production efficiency.

Theoretically, raw material inventory management is the process of regulating and controlling the quantity, quality, and timing of raw material procurement to meet production needs (Heizer & Render, 2020). Good inventory management can prevent raw material

shortages that cause production downtime or excess inventory that leads to wasteful storage costs.

Raw Material Inventory Management with Production Efficiency Operations management theory also highlights the importance of inventory management. According to Heizer & Render (2017), good inventory management ensures that raw materials are available at the right time, in the right quantity, and of the right quality. Poor management can lead to stockouts or overstocking, which results in wasted costs and time, thereby reducing production efficiency. Technology Management and Raw Material Inventory Management with Production Efficiency These two factors complement each other: technology helps speed up processes and maintain quality. Inventory management ensures that the required raw materials are always available. If both are managed optimally, the production process will run more smoothly, with minimal obstacles and efficiently. This result is reinforced by research by Putra & Wibowo (2021), which found that companies with good inventory management systems tend to be more efficient in their production processes. This is due to the timeliness of raw material procurement, optimal stock control, and reduction of unused or expired raw materials. At CV. Nilani Global Sumatera, efficiency in raw material inventory management can be achieved through digital recording of raw material inflows and outflows, ordering materials according to the production schedule, and regular evaluation of suppliers. Thus, the production process can run without obstacles, avoiding delays and reducing storage costs and material waste.

## CONCLUSION

From the research findings regarding the Influence of Technology Management and Raw Material Inventory Management on Production Efficiency at CV. Nilani Global Sumatera, the following conclusions can be drawn: Technology Management (X1) has a partially significant effect on Production Efficiency. This is evidenced by a t-value of 3.632, which is greater than the t-table value of 1.9861, and a significance value of  $0.000 < 0.05$ . This means that the better the technology management implemented by the company, the greater the efficiency in the production process. Proper technology management can help companies increase productivity, reduce production costs, and accelerate work processes. Raw Material Inventory Management (X2) also has a significant partial effect on Production Efficiency. This is indicated by a t-value of 4.126, which is greater than the t-table value of 1.9861 and a significance value of  $0.001 < 0.05$ . This means that effective raw material inventory management can ensure the timely availability of materials for production, prevent stock shortages or surpluses, and minimise waste, thereby supporting production process efficiency. Simultaneously, Technology Management and Raw Material Inventory Management have a significant effect on Production Efficiency. This is indicated by the F statistical test results, which have a significance value of  $0.000 < 0.05$ . Thus, both independent variables together contribute to increasing production efficiency at CV. Nilani Global Sumatera. Companies that can optimally manage technology and raw material inventory will have advantages in terms of speed, quality, and production costs.

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