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THE INFLUENCE OF LAYOUT AND WAREHOUSE MANAGEMENT SYSTEM ON THE EFFECTIVENESS OF WAREHOUSE MANAGEMENT PT BGR LOGISTIK INDONESIA SEMARANG REGIONAL DIVISION

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Abstract

This study aims to analyze the influence of warehouse layout and Warehouse Management System on the effectiveness of warehouse management at PT BGR Logistik Indonesia Regional Division Semarang. The problem arises from a warehouse layout that does not meet operational standards and the suboptimal implementation of WMS, leading to stock recording errors and decreased operational efficiency. This research employs a quantitative approach using a survey method. The population includes all employees in the Warehouse Division of PT BGR Logistik Indonesia Semarang Branch, with a sample of 35 respondents selected through a saturated sampling technique. Data were collected using questionnaires with a Likert scale of 1–5 and analyzed using simple and multiple linear regression through SPSS version 25. The results show that both warehouse layout and Warehouse Management System have a positive and significant influence on the effectiveness of warehouse management, both partially and simultaneously. The coefficient of determination (R^2) of 86.5% indicates that the two independent variables together explain the majority of the variance in warehouse management effectiveness. This study offers novelty by examining the simultaneous integration of digital warehouse management systems and physical layout planning, as well as highlighting their impact on work effectiveness within the logistics company context. These findings emphasize the importance of synergy between technical aspects and information systems in supporting efficient and accurate warehouse operations.

Keywords *Layout, Warehouse Management System, Warehouse Management Effectiveness*

INTRODUCTION

The transportation and warehousing sector play a strategic role in supporting national economic growth. The supply chain is an inseparable component of logistics, encompassing various stages from production, raw material distribution, spare parts, work-in-process goods, to finished products. At each of these stages, warehouses serve a central function as facilities for receiving, temporary storage, and distribution of goods and materials. Warehousing is a vital part of industry operations, acting as a buffer before products reach consumers or retailers. According to Haryono (2020) in Adawiyah (2022), warehouse management is a critical component in the supply chain, covering activities such as capacity optimization, location decisions, handling speed, material flow, and quality control. Purwanto (2020) in Adawiyah (2022) added that well-managed warehouses can enhance operational effectiveness by ensuring the smooth flow of incoming and outgoing goods and maintaining secure and orderly storage. Conversely, ineffective warehouse management can increase operational costs and reduce productivity.

PT BGR Logistik Indonesia is a company engaged in logistics and warehouse management services, including the storage and distribution of goods such as fertilizers. The company has adopted digitalization in various operational aspects to improve supply chain efficiency and effectiveness. Although PT BGR Logistik Indonesia Regional Division Semarang has implemented a Warehouse Management System (WMS) and designed a warehouse layout to support operations, the effectiveness of warehouse management remains suboptimal. The primary issue lies in the misalignment between the implemented system and actual field practices, especially in the put-away, storage, and picking processes. The put-away process often disregards the WMS-recommended storage locations due to limited space and operator tendencies to place items in more convenient locations. This results in discrepancies between system data and actual item locations. In the storage process, items are not efficiently grouped—some are mixed by type or size and placed without considering product rotation. As a result, retrieval becomes inefficient. The picking process is also ineffective due to narrow and unstructured paths and unsystematic item placement, leading to manual searches, time inefficiencies, and a higher risk of picking errors.

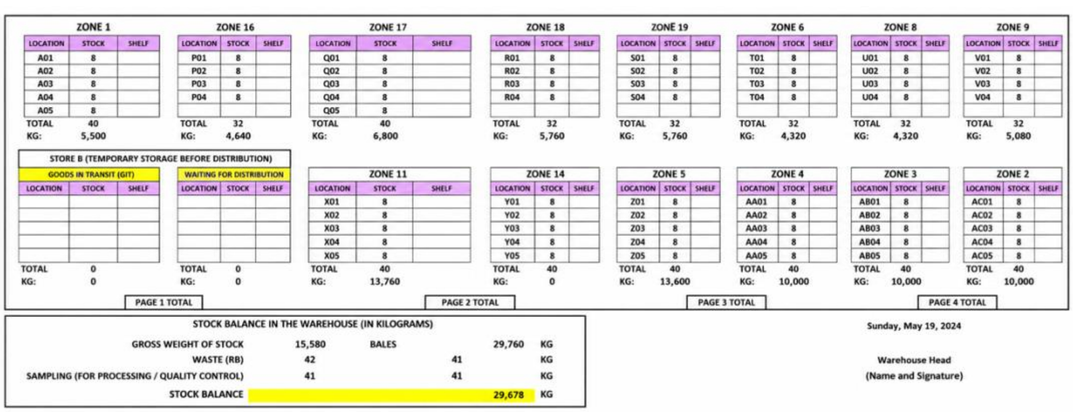

Figure 1. Warehouse Layout of Jenarsari Kendal

Field observations and input from warehouse staff indicate several layout-related issues, such as the misalignment of stacking arrangements with SOPs, resulting in inefficient space usage. Narrow aisles between storage zones hinder equipment movement and increase safety risks. Items stored directly against walls obstruct ventilation and inspection access. Mixing different product types in a single stack and poorly arranged pallets further complicate inventory organization and retrieval.

Table 1. Stock Discrepancy Data of Jenarsari Kendal Warehouse

Month	WMS Physical Stock (Ton)	Warehouse Physical Stock (Ton)	Stock Discrepancy	Stock Discrepancy Percentage (%	Remark
January	1.300,00	1.300,00	0,000	0,00%	-
February	1.200,00	1.199,85	0,150	1,25%	Human Eror
March	1.195,00	1.194,73	0,270	2,26%	System error
April	1.203,00	1.203,00	0,000	0,00%	-
May	1.202,00	1.182,00	20,000	166,39%	Consigment
June	1.195,00	1.195,00	0,000	0,00%	-
July	1.200,00	1.200,00	0,000	0,00%	
August	1.190,00	1.189,81	0,190	1,60%	System Eror
September	1.300,00	1.299,68	0,320	2,46%	Human Eror
October	1.190,00	1.190,00	0,000	0,00%	-
November	1.190,00	1.189,64	0,360	3,03%	Human error
December	1.203,00	1.203,00	0,000	0,00%	-
Total	**14.568**	**14.547**	**21,290**	**176,98%**	

Source: PT BGR Logistik Indonesia Regional Division Semarang

Data from the stock opname records of PT BGR Logistik Indonesia Semarang shows a total stock discrepancy of 21.29 tons over one year, with a cumulative variance of 176.98%. These discrepancies reflect significant misalignment between recorded inventory and actual stock conditions. The contributing factors include human error, system issues, and consignment stock. This indicates that WMS implementation by warehouse staff is still not optimal and requires both technical and procedural improvements to ensure accuracy and operational effectiveness.

Research by Rafli (2022) found that the combination of warehouse layout and WMS contributes 70.5% to warehouse management effectiveness. This demonstrates that effective warehouse operations are not dependent on a single factor, but rather the integration of spatial planning and digital systems. Hidayat et al., (2023) support this, reporting a combined determination coefficient of 86.5%, showing that both layout and WMS jointly account for nearly all variation in warehouse effectiveness. A well-structured layout integrated with advanced WMS creates a more efficient and traceable warehouse environment, allowing for accurate inventory tracking and optimized material flow. Based on the above, it is evident that warehouse layout and WMS are critical factors influencing warehouse management effectiveness. Observations suggest persistent challenges in these two areas at PT BGR Logistik Indonesia Regional Division Semarang. Therefore, this study aims to analyze how layout and WMS affect warehouse management effectiveness.

LITERATURE REVIEW

Supply Chain

Ahmad et al., (2023), Supply Chain Management is a series of integrated processes and activities designed to plan, execute, control, and monitor the flow of goods, services, and information from the initial stage to the final point in the supply chain

Warehouse

Hadi (2019), a warehouse is a designated area used to store inventory, spare parts, and raw materials. It serves as a temporary storage location before goods are distributed or used (Anake Nagari et al., 2024).

Layout

As stated by Kosasih and Sobarsa (2009) in (Sari & Priyanto, 2024) and Rony et al. (2019), layout can be defined as the organization and placement of equipment, labor, and process stages involved in the production of goods or services.

Layout Indicators (Rony et al., 2019):

1. Type of material handling equipment used
2. Space and room capacity
3. Required flow of information
4. Aesthetic and environmental needs
5. Movement cost from one workstation to another

Warehouse Management Effectiveness

Warehouse management effectiveness refers to how well a company utilizes resources in managing warehouse operations, including receiving, put-away, storage, picking, and shipping (Adawiyah, 2022). Effectiveness warehouse management Indicators (Sari & Priyanto, 2024):

1. Receiving process
2. Storage process
3. Maintenance process
4. Dispatching process
5. Administrative process

METHODS

Research Approach

Population and Sample

The population of this research includes all employees of the Warehouse Division at PT BGR Logistik Indonesia Reginal Division Semarang. A saturated sampling technique was used, involving the entire population due to the limited number of respondents. Therefore, the total sample consists of 35 respondents.

Research Data Source

The data in this study consists of primary and secondary data. Primary data was obtained through structured questionnaires using a 5-point Likert scale. Secondary data was collected from company documents, observations, and literature related to warehouse operations.

Data Analysis Techniques

Data analysis was conducted using SPSS version 25. The analysis included classical assumption tests (normality, multicollinearity, heteroscedasticity, and autocorrelation), simple linear regression, and multiple linear regression. These methods were used to determine the partial and simultaneous effects of the independent variables on warehouse management effectiveness.

RESULT AND DISCUSSION

The total number of respondents sampled in this study is 35 individuals, representing all employees of PT BGR Logistik Indonesia Regional Division Semarang. This sample was selected to represent the entire workforce across various work teams within the company. The respondents reflect individuals working in teams, so the results obtained can illustrate their contribution to the overall effectiveness of warehouse management, both as individuals and as part of a team. Respondent characteristics data, collected through a Google Form questionnaire, includes information on gender and age. The following is the information on respondent characteristics obtained from this study.

Table 2. Respondent Characteristics by Gender

Gender	Frequency	Percentage
Male	29	82,9%
Female	6	17,1%
Total	35	100%

Based on the table above, it is known that the gender distribution of respondents at PT BGR Logistik Indonesia Regional Division Semarang consists of 29 male respondents (approximately 82.9%) and 6 female respondents (approximately 17.1%). Therefore, it can be concluded that the majority of respondents are male.

***Table 3.* Respondent Characteristics by Age**

Age	Frequency	Precentage
30-35 years	6	17,1%
36-40 years	11	31,4%
40-45 years	6	17,1%
46-50 years	7	20,1%
> 50 years	5	14,3%
Total	35	100%

Based on Table 3, the age distribution of respondents at PT BGR Logistik Indonesia Regional Division Semarang is as follows: 6 respondents (17.1%) are aged 30–35 years, 11 respondents (31.4%) are aged 36–40 years, 6 respondents (17.1%) are aged 41–45 years, 7 respondents (20.1%) are aged 46–50 years, and 5 respondents (14.3%) are over 50 years old. Thus, it can be concluded that most respondents fall within the 36–40 years age group, representing 31.4%, which is categorized as a productive age range.

Instrument Result

Validity Result

The validity test measures the extent to which a variable can represent the concept being studied. A variable is considered valid if it has a high level of validity (Sugiyono, 2022). A questionnaire instrument is declared valid if the value of r-count > r-table, and invalid if r- count < r-table. The validity test results are presented in the table below:

Table 4. Validity Test Result

Indicator	Item	R_{count}	R_{table}	Remark
Layout (X1)				
Material handling equipment	X1.1	0,638	0,344	Valid
	X1.2	0,743	0,344	Valid
Space and room capacity	X1.3	0,610	0,344	Valid
	X1.4	0,525	0,344	Valid
Information flow	X1.5	0,774	0,344	Valid
	X1.6	0,792	0,344	Valid
Aesthetics and environment	X1.7	0,790	0,344	Valid
	X1.8	0,744	0,344	Valid
Movement cost	X1.9	0,810	0,344	Valid
	X1.10	0,750	0,344	Valid
Warehouse Management System (X2)				
Real-time inventory management	X2.1	0,743	0,344	Valid
	X2.2	0,636	0,344	Valid
Inventory error reduction	X2.3	0,656	0,344	Valid
	X2.4	0,639	0,344	Valid
Efficient return process	X2.5	0,722	0,344	Valid
	X2.6	0,601	0,344	Valid
Fast product delivery	X2.7	0,769	0,344	Valid
	X2.8	0,778	0,344	Valid
Increased customer satisfaction	X2.9	0,727	0,344	Valid
	X2.10	0,688	0,344	Valid
Warehouse Management Effectiveness (Y)				
Goods receipt	Y.1	0,561	0,344	Valid
	Y.2	0,725	0,344	Valid

Goods storage	Y.3	0,704	0,344	Valid
	Y.4	0,683	0,344	Valid
Goods maintenance	Y.5	0,676	0,344	Valid
	Y.6	0,755	0,344	Valid
Goods release	Y.7	0,702	0,344	Valid
	Y.8	0,605	0,344	Valid
Goods administration	Y.9	0,672	0,344	Valid
	Y.10	0,487	0,344	Valid

Table 4 shows that all indicators used to measure each variable have a correlation value greater than the r-table (0.344). Thus, it can be concluded that all indicators for each variable are declared valid.

Reliability Test

The reliability test measures the consistency and stability of an instrument's measurement results. An instrument is considered reliable if it produces consistent data under various conditions and times. The Cronbach's Alpha method is used to assess the internal consistency among items. An instrument is considered reliable if the Cronbach's Alpha value is greater than 0.60, and unreliable if it is less than 0.60 (Sugiyono, 2022). The reliability test results are presented in the table below:

Table 5. Reliability Test Result

Variabel	R	Cronbach's Alpha	Remark
Layout (X1)	0,896	0,60	Reliabel
Warehouse Management System (X2)	0,883	0,60	Reliabel
Warehouse Management Effectiveness (Y)	0,851	0,60	Reliabel

Source: Processed data, 2025

Based on the established criteria for determining reliability, Table 5 shows that all variables have a Cronbach's Alpha value greater than 0.60, indicating that each variable is reliable and can be used in this research.

Classical Assumption Test

Normality Test

In this study, the normality test was conducted using the Kolmogorov-Smirnov test because the sample size is greater than 30. The decision-making process in the Kolmogorov- Smirnov normality test is based on comparing the Asymp. Sig. (2-tailed) value with the significance level α = 0.05. If the Asymp. Sig. value is greater than 0.05, the data can be considered normally distributed (Ghozali, 2021). The results of the normality test are presented in the table below:

Table 6. Normality Test Result

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		35
Normal Parameters[a,b]	Mean	,0000000
	Std. Deviation	2,03795949
Most Extreme Differences	Absolute	,074
	Positive	,058
	Negative	-,074
Test Statistic		,074
Asymp. Sig. (2-tailed)		,200[c,d]

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. This is a lower bound of the true significance.

Source: Processed data, 2025

Based on Table 6, the results of the normality test using the Kolmogorov-Smirnov method show a significance value of 0.200, which is greater than 0.05. This indicates that the residual data is normally distributed. Therefore, it can be concluded that the normality assumption in the regression model is fulfilled, supporting the feasibility of further model analysis.

Multicollinearity Test

The multicollinearity test is used to detect linear relationships between independent variables. Multicollinearity is considered absent if the Variance Inflation Factor (VIF) is less than 10.0 and the Tolerance value is greater than 0.10; conversely, multicollinearity is present if VIF > 10.0 and Tolerance < 0.10 (Ghozali, 2021). The results of the multicollinearity test are presented in the table 7.

Based on Table 7, the tolerance value for both independent variables—Layout (X1) and Warehouse Management System (X2)—is 0.160, which exceeds the threshold of 0.10 (> 0.10), and the VIF (Variance Inflation Factor) is 6.238, which is below the threshold of 10 (< 10). This indicates that there is no independent variable that has a high correlation with another. Therefore, it can be concluded that the regression model in this study does not experience multicollinearity issues.

Table 7. Multicollinearity Test Result

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	7,590	2,221		3,418	,002		
	Tata Letak	,404	,145	,497	2,791	,009	,160	6,238
	Warehouse Management System	,374	,152	,438	2,464	,019	,160	6,238

a. Dependent Variable: Efektivitas Pengelolaan Gudang

Heteroscedasticity Test

The heteroscedasticity test aims to determine whether there is an unequal variance of residuals across observations in a regression model. A good regression model should be free from heteroscedasticity. The Glejser test was used in this study by regressing the absolute residual values (AbsRes) against the independent variables. If the significance value (Sig.) is greater than 0.05, it can be concluded that heteroscedasticity is not present (Ghozali, 2021). The results of the heteroscedasticity test are presented in the following table:

Table 8. Heteroscedasticity Test Result

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,527	1,262		,417	,679
	Tata Letak	,002	,082	,008	,019	,985
	Warehouse Management System	,030	,086	,150	,344	,733

a. Dependent Variable: Abs_RES

Based on the results shown in Table 4.8, the significance values for the variables Layout (X1) and Warehouse Management System (X2) are all greater than 0.05. This indicates that none of the independent variables significantly affect the absolute residual values. Therefore, it can be concluded that the regression model in this study does not exhibit heteroscedasticity.

Autocorrelation Test

In this study, the researcher used the Durbin-Watson test to determine whether there is a correlation between the error terms in period t and the error terms in the previous period t–1. Based on the criteria for the autocorrelation test, if the value falls within du < d < 4 – du, it is concluded that no autocorrelation exists. Conversely, if d < du or d > 4 – dl, then autocorrelation is present (Ghozali, 2021). The following are the results of the autocorrelation test conducted by the researcher.

Table 9. Autocorrelation Test Result

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,915[a]	,838	,827	2,101	1,851

a. Predictors: (Constant), Warehouse Management System, Tata Letak

b. Dependent Variable: Efektivitas Pengelolaan Gudang

Based on Table 9, the Durbin-Watson test result is 1.851. Referring to the Durbin- Watson table for a sample size of 35 respondents, the following critical values are obtained: dl = 1.343, du = 1.584, 4 – dl = 2.657, and 4 – du = 2.416. Since the Durbin-Watson value falls within the range of du (1.584) < d (1.851) < 4 – du (2.416), the null hypothesis is accepted. This indicates that there is no positive or negative autocorrelation in the regression model.

Multiple Linear Regression Analysis

Multiple linear regression analysis is used to examine the causal relationship between independent variables and the dependent variable, as well as to identify the extent to which the independent variables influence the dependent variable in the study (Zainuddin & Aditya, 2024). The results of the multiple linear regression analysis are presented in the table below:

Table 10. Multiple Linear Regression Analysis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7,590	2,221		3,418	,002
	Tata Letak	,404	,145	,497	2,791	,009
	Warehouse Management System	,374	,152	,438	2,464	,019

a. Dependent Variable: Efektivitas Pengelolaan Gudang

Based on Table 10, the multiple linear regression equation can be written as: Y = 7,590 + 0,404X1 + 0,374X2 + ε

1. Constant (α = 7.590): This represents the level of warehouse management effectiveness when the variables of warehouse layout (X_1) and Warehouse Management System (X_2) have no influence.

2. Coefficient of X_1 (b_1 = 0.404): Each one-unit increase in warehouse layout leads to a 0.404 increase in warehouse management effectiveness.
3. Coefficient of X_2 (b_2 = 0.374): Each one-unit increase in the Warehouse Management System leads to a 0.374 increase in warehouse management effectiveness.

All independent variables have a positive influence on warehouse management effectiveness.

Coefficient of Determination Test (R^2)

The coefficient of determination (R^2) measures the extent to which independent variables explain the dependent variable. The R^2 value ranges from 0 to 1. The closer the value is to 1, the stronger the relationship between the independent and dependent variables, indicating a better model fit. Conversely, an R^2 value close to 0 suggests a weak relationship and a poor model (Ghozali, 2021). The test results are presented in the following table:

Table 11. Coefficient of Determination Test Result

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,915[a]	,838	,827	2,101

a. Predictors: (Constant), Warehouse Management System, Tata Letak

b. Dependent Variable: Efektivitas Pengelolaan Gudang

Based on the coefficient of determination (R^2) value of 0.838 or 83.8%, it can be concluded that the variables Warehouse Layout (X_1) and Warehouse Management System (X_2) jointly influence Warehouse Management Effectiveness (Y) by 83.8%. This means that 83.8% of the variation in warehouse management effectiveness can be explained by the two independent variables. Meanwhile, the remaining 16.2% is influenced by other factors not included in the scope of this study. Therefore, both independent variables make a significant contribution to warehouse management effectiveness, while external factors not examined in this research also play an important role.

Hypothesis test

T-Test (Partial test)

This test aims to determine whether each independent variable has a significant effect on the dependent variable. The test is conducted by comparing the calculated t-value of each variable with the value in the t-table at a 5% significance level (α = 0.05) (Ghozali, 2021). A significance value less than 0.05 indicates that the hypothesis is accepted, meaning there is an effect between the independent and dependent variables. Conversely, a significance value greater than 0.05 indicates that the hypothesis is rejected, meaning there is no significant effect between the independent and dependent variables. The results are presented in the following table:

Table 12. T-test Result

Variabel	t count	Sig. Value	Remark
Layout (X1)	2,791 > 2,037	0,09 < 0,05	There is an influence of X1 on Y
Warehouse Management System (X2)	2,464 > 2,037	0,19 < 0,05	There is an influence of X2 on Y

1. Warehouse Layout has a partial effect on the effectiveness of warehouse management. This is evidenced by a significance value of 0.09 < 0.05 and a t-count of 2.791 > 2.037, thus H1 is accepted, indicating a positive and significant influence of variable X1 on variable Y.
2. Warehouse Management System has a partial effect on the effectiveness of warehouse management. This is shown by a significance value of 0.19 < 0.05 and a t-count of 2.464 > 2.037, so H2 is accepted, which means there is a positive and significant influence of variable X2 on variable Y.

F-test (Simultaneous Test)

The F-test is conducted to determine whether the independent variables jointly have a significant effect on the dependent variable. The basis for decision-making in the F-test is as follows, If the significance value is less than 0.05, the independent variables have a significant simultaneous effect on the dependent variable. If the significance value is greater than 0.05, the independent variables do not have a significant simultaneous effect (Ghozali, 2021).

Table 13. F-test Result

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	728,331	2	364,166	82,524	,000[b]
	Residual	141,211	32	4,413		
	Total	869,543	34			

a. Dependent Variable: Efektivitas Pengelolaan Gudang

b. Predictors: (Constant), Warehouse Management System, Tata Letak

Based on Table 4.21, the result of the simultaneous test (F-test) shows that the F- calculated value is 82.524, which is greater than the F-table value (F_calculated = 82.524 > F_table = 3.29), with a significance value of 0.000, which is lower than 0.05 (Sig. = 0.000 < 0.05). Therefore, it can be concluded that H_0 is rejected and H_3 is accepted, meaning that there is a simultaneous effect of Layout (X1) and Warehouse Management System (X2) on Warehouse Management Effectiveness (Y).

DISCUSSION

The Influence of Warehouse Layout on Warehouse Management Effectiveness

The Warehouse Layout variable (X1) shows a significance value of 0.000 < 0.05, with a positive regression coefficient of 0.731, indicating that hypothesis H1 is accepted and H0 is rejected. This suggests that the layout implemented at PT BGR Logistik Indonesia Regional Division Semarang has a positive and significant effect on warehouse management effectiveness. These findings are consistent with the study by Hidayat et al. (2023) at PT DHL Global Forwarding, which showed that warehouse layout significantly influences the effectiveness of warehouse management. A well-designed layout facilitates smooth operations such as receiving, storage, and goods distribution.

The Influence of Warehouse Management System (WMS) on Warehouse Management Effectiveness

The Warehouse Management System variable (X2) shows a significance value of 0.000 < 0.05, with a positive regression coefficient of 0.640, indicating that hypothesis H2 is accepted and H0 is rejected. This implies that the Warehouse Management System implemented at PT BGR Logistik Indonesia Regional Division Semarang also has a positive and significant effect on warehouse management effectiveness. This result is in line with Rafli's (2022) research, which found that WMS significantly affects warehouse management effectiveness at PT Go Trans Logistics International, as it provides fast and accurate information on inventory status, item locations, and distribution flow within the warehouse.

The Influence of Warehouse Layout and Warehouse Management System on Warehouse Management Effectiveness

Based on the analysis results, both independent variables—warehouse layout (X1) and Warehouse Management System (X2)—simultaneously have a positive and significant effect on warehouse management effectiveness (Y) at PT BGR Logistik Indonesia Regional Division Semarang. This is supported by a significance value of 0.000 < 0.05 and an F-count of 102.751 > F-table of 3.28. These findings are consistent with the study by Hidayat et al. (2023) at PT DHL Global Forwarding, which demonstrated that layout and WMS together significantly influence warehouse management effectiveness. This is also reinforced by Rafli (2022), who stated that the combination of functional layout and digital warehouse management systems can improve spatial and time efficiency while reducing the potential for errors in warehouse operations.

CONCLUSION

Based on the results of data analysis and the discussion carried out, it can be concluded that the effectiveness of warehouse management at PT BGR Logistik Indonesia Regional Division Semarang can be improved through enhancements in warehouse layout and the Warehouse Management System. The analysis in this study shows that warehouse layout has a positive and significant effect on warehouse management effectiveness, the Warehouse Management System also has a positive and significant effect, and both variables jointly influence warehouse management effectiveness in a positive and significant manner.

This study recommends the integration of warehouse layout and Warehouse Management System to achieve optimal warehouse performance. However, the limitation of the study to a single company and a specific sample requires further research for broader generalization. Future studies with a wider scope are necessary to validate and strengthen these findings.

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