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Digital Transformation in Logistics Companies and Its Impact on Human Resources Marketing Strategies and Competition in International Trade

Nurmin Arianto¹, Kasmad², Lia Asmalah³, Windy Gustia Wardani⁴
^{1,2,3,4} Program of Magister Management, Pamulang University, Banten, Indonesia

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ABSTRACT

This study aims to analyze Digital Transformation in Logistics Companies and Its Impact on Human Resources, Marketing Strategy, and Competition in International Trade. This study uses a quantitative method with a descriptive and explanatory approach. survey research method. The data analysis technique for this study uses statistical analysis using the Smart PLS (Partial Least Square) 3.0 program. The population and sample in this study are logistics companies that have implemented digital transformation, both nationally and internationally, the technique used in this study is purposive sampling. The results of the study show that, 1) Digital Transformation in logistics companies has an impact on HR in international trade, 2) Digital Transformation of logistics companies does not have an impact on marketing strategies in international trade, 3) Digital Transformation of logistics companies does not have an impact on competition in international trade.

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Corresponding Author:

Nurmin Arianto
Program of Magister Management, Pamulang University, Banten, Indonesia
Email: dosen01118@unpam.ac.id

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INTRODUCTION

The rapid development of information and communication technology has driven digital transformation in various sectors, including the logistics and international trade sectors. Digital transformation not only impacts business systems and processes, but also significantly affects human resource (HR) management in companies. Also the management of company HR. In an era of increasingly open globalization, speed, accuracy, and efficiency are the main priorities in international trade. Therefore, businesses engaged in international trade must have employees who are innovative, flexible, and have strong digital capabilities [1], [2].

The emerging phenomenon shows that digital transformation has changed the role and landscape of HR jobs. The need for job skills has changed as a result of the digitalization of logistics processes in the global supply chain due to the use of artificial intelligence (AI), big data, and the Internet of Things (IoT). Human resources no longer only have to have technical skills; now they must also be able to use digital technology to improve the efficiency and competitiveness of companies in the global market [3], [4].

On the other hand, digital transformation also provides great opportunities for HR to increase productivity and innovation. Technology enables real-time cross-border collaboration, more transparent supply chain management, and data-based decision making. However, without HR readiness and adaptation, this potential will not be optimal. Therefore, it is important for companies to develop HR management strategies that are in line with the digital transformation agenda, in order to compete effectively in

increasingly competitive international trade. By utilizing technological advances to develop human resources, technology in the digital transformation era will be responsive and proactively competitive [5].

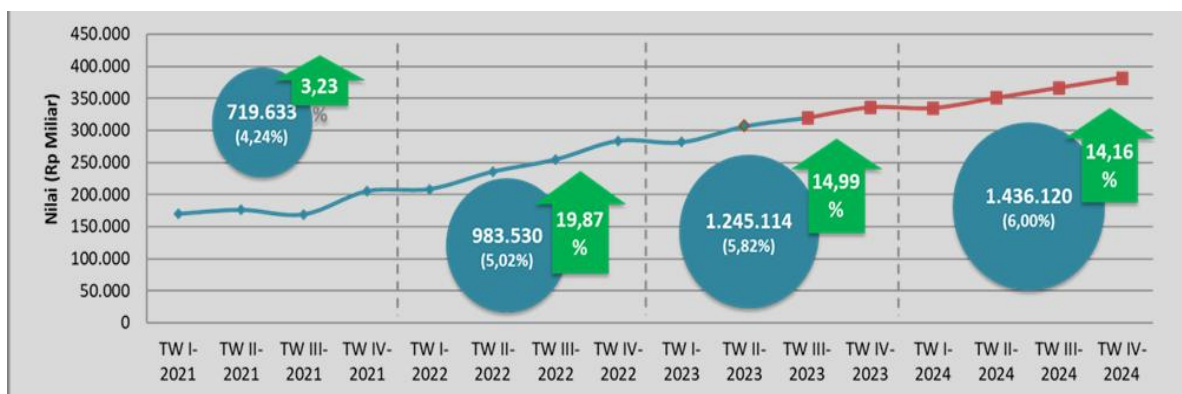
International trade is a very complex and competitive business environment where speed, accuracy and efficiency are essential to win in the global market. In such a situation, the role of logistics becomes very important because it functions as a link between markets, producers and consumers across countries. Due to the rapid development of technology, logistics companies must carry out digital transformation to become more competitive and support marketing strategies that are more in line with the needs of the global market [6], [7].

Operational aspects such as warehouse management, supply chain integration, and tracking of goods are affected by the digital transformation in the logistics industry. This also affects marketing strategies. Logistics companies that use digital systems based on big data, cloud computing, and artificial intelligence can provide more transparent services, enable personalized service offerings, and can reach markets around the world faster. This increases the company's attractiveness in the eyes of foreign customers and global trading partners [8], [9].

Digital transformation in the logistics sector has become a key driver in increasing Indonesia's competitiveness in the international trade arena. With the adoption of technologies such as the Internet of Things (IoT), artificial intelligence (AI), and data-driven supply chain management systems, logistics companies are able to improve operational

efficiency and responsiveness to global market demand. The logistics sector has the potential to be a driver of slowing economic growth. One indicator is the increasing contribution of the transportation and warehousing sector to

Gross Domestic Product (GDP) in recent years, as shown in the following [figure 1](#).



Source: BPS Supply Chain, 2024

Figure 1. Development and Projection of GDP in the Transportation and Warehousing Sector in 2021-2024

Based on [Figure 1](#) above, it is known that in the 2021-2023 period, the contribution of the transportation and warehousing sector in 2021 was 4.24% and increased to 5.02% in 2022. Based on data from the Central Statistics Agency (BPS) for the second quarter of 2023, Supply Chain Indonesia (SCI) projects the sector's contribution to be 5.82% in 2023 and 6.00% in 2024. SCI projects the contribution of the transportation and warehousing sector in 2023 to be IDR 1,245 trillion or grow by 14.99% and in 2024 to be IDR 1,436 trillion or grow by 14.16% [\[10\]](#), [\[11\]](#).

Logistics service providers need to be encouraged to improve their business model position from foundation services to value-added services (third-party logistics providers), lead logistics, and even synchronized supply chains. This requires improving the technological capabilities, processes, and HR competencies mentioned above [\[12\]](#).

Based on the background and phenomena that occurred above, the author is interested in conducting research entitled "Digital Transformation in Logistics Companies: Its Impact on Human Resources, Marketing Strategy, and Competition in International Trade"

RESEARCH METHODS

This study uses a quantitative approach. This study was conducted to analyze Digital Transformation in Logistics Companies: Its Impact on HR, Marketing Strategy, and Competition in International Trade. The method of data collection in this study uses a survey research method. The data analysis technique in this study uses regression analysis with statistical analysis with Path Analysis using the Smart PLS (Partial Least Square) 3.0 program.

Population and Sample

The population in this study is all logistics companies that have implemented digital

transformation, both nationally and internationally, operating in Indonesia and involved in international trade activities such as: JNE, J&T, Cargo, DHL and FedEx. which includes HR employees/staff, marketing managers, and strategic division leaders.

The sample in this study is a verified logistics company that has implemented digitalization. The technique used in this study is purposive sampling. The number of samples in this study is from each logistics company with 15 respondents so the total sample is 5 x 15: 75 respondents.

Data source

The types and sources of data used in this study are Primary data. Primary data is research data obtained from direct research results in the field, such as respondents' answers describing Digital Transformation in Logistics Companies: Its Impact on HR, Marketing Strategy, and Competition in International Trade For this purpose, researchers use questionnaires.

Data collection technique

The data collection method used in this study is a questionnaire, namely a data collection method by distributing questionnaires (question lists) addressed to respondents.

1. Data Analysis Techniques

The data analysis technique of this research uses PLS software version 3.0 (Partial Least Square) which is a variant-based structural equation analysis (Structural Equation Model) that can simultaneously test measurement models and test structural models. From the research results collected, the following analysis methods can be used:

a. Measurement Model (Outer Model)

Measurement model (*outer model*) is conducted to test the validity and reliability of the research instrument. The validity test in this study uses convergent validity and discriminant validity. Convergent validity is seen from the measurement model with indicator reflection which is assessed based on the correlation of the model between component score/item score with construct score calculated by PLS. If the correlation is more than 0.70 with the construct to be measured, then the individual reflection measure is said to be high. For early stage research, measurement with an outer loading value of 0.5-0.6 has been considered sufficient [13].

Ghozali (2015:114) [14] explains that in assessing discriminant validity using other methods, the values are compared *square root of average variance extracted*(AVE) The recommended value is that the AVE value must be greater than 0.5. The AVE formula according to Ghozali (2015:115) is:

$$AVE = \lambda_i^2 \lambda_i^2 + \text{ivar}(\epsilon_i) \quad (1)$$

b. Structural Model (Inner Model)

The structural model is used to predict the causal relationship between latent variables. The structural model is evaluated by looking at the percentage of variance explained by the R² value for the dependent variable using the Stone-Geisser Q-Square Test measure. [14]

c. Hypothesis Testing

Hypothesis testing (β , γ , and λ) was conducted using the bootstrap resampling method developed by Geisser & Stone (Ghozali, 2015) [14]. According to Herlambang et. Al (2012) [15], the measure of the significance of hypothesis

support can be used by comparing the t table and t statistic values through the following decision-making criteria [16]:

- 1) If t statistic > t table and p values < sig 0.05 means Ha is accepted, Ho is rejected.
- 2) If t statistic ≤ t table and p values ≥ sig 0.05 means Ha is rejected, Ho is accepted.

RESULT AND DISCUSSION

Outer Model Analysis

Measurement model testing (outer model) is used to determine the specifications of the relationship between latent variables and their manifest variables. This testing

includes convergent validity, discriminant validity and reliability.

a. Convergent Validity

According to Ghozali (2018:25) [14] a correlation can be said to meet convergent validity if it has a loading value of > 0.7. The output shows that the loading factor provides a value above the recommended value of 0.7. However, in the scale development stage of research, a loading of 0.60 is still acceptable. So that the indicators used in this study have met convergent validity (Convergen Validity). The structural model in this study is shown in the following [figure 2](#).

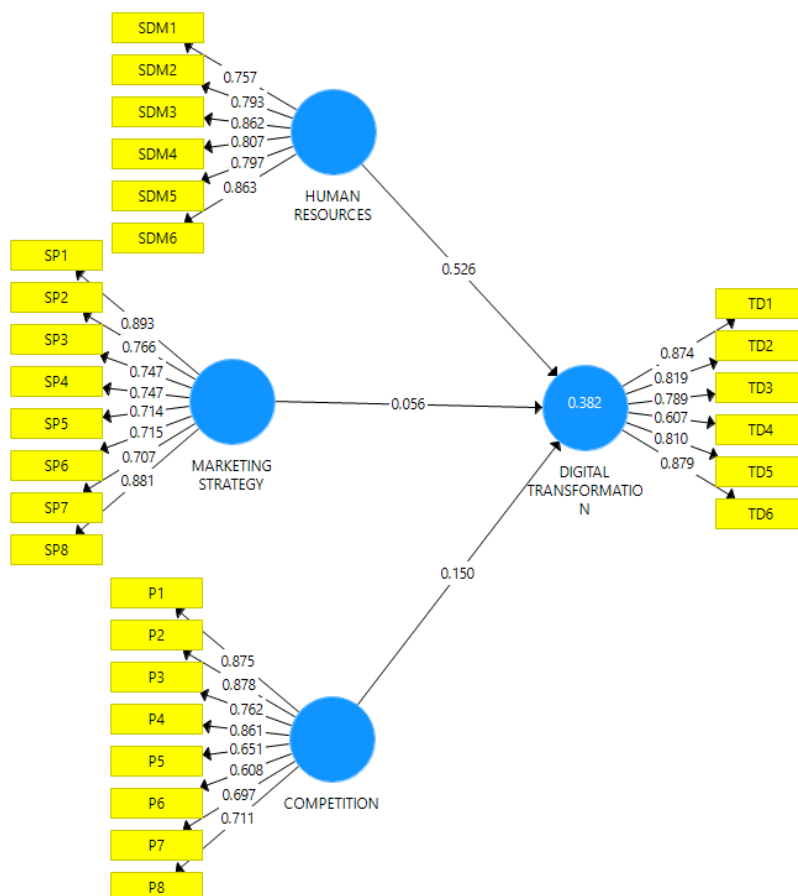


Figure 2. Outer Model, Algorithm Testing

The results of the structural equation modeling (SEM) highlight the varying

impacts of human resources, marketing strategy, and competition

on digital transformation. The coefficient of determination (R^2) for digital transformation is 0.382, indicating that approximately 38.2% of the variance in digital transformation can be explained by the three independent constructs. This suggests a moderate level of explanatory power and that additional factors beyond those analyzed may also contribute significantly to digital transformation initiatives.

First, human resources emerge as the most influential factor, with a path coefficient of 0.526. This finding emphasizes the critical role of human capital in driving digital transformation. Competence, skills, adaptability, and readiness of employees appear to be the foundation for adopting and implementing new digital technologies. This aligns with previous studies which argue that digital transformation is not solely a technological issue but also a human capability challenge.

Second, competition shows a weaker yet positive influence on digital

transformation, with a path coefficient of 0.150. This result indicates that competitive pressure may encourage organizations to adopt digital technologies, but its effect is not as dominant as internal human resource capabilities. Competition may act more as an external motivator rather than a direct driver of transformation, suggesting that organizations must first possess the internal capacity (e.g., human resources) to respond effectively to competitive forces.

Third, the influence of marketing strategy on digital transformation is found to be minimal, with a path coefficient of only 0.056. This negligible relationship implies that while marketing strategies are important for organizational performance, they may not directly accelerate digital transformation. Instead, marketing strategies could play an indirect role by shaping customer engagement and market orientation, which in turn may create conditions supportive of digital initiatives.

Table 1. Outer Loading

	HUMAN RESOURCES_	MARKETING STRATEGY_	COMPETITION	DIGITAL TRANSFORMATION_
SDM1	0.757			
HR2	0.793			
SDM3	0.862			
SDM4	0.807			
SDM5	0.797			
SDM6	0.863			
SP1		0.893		
SP2		0.766		
SP3		0.747		
SP4		0.747		

	HUMAN RESOURCES_	MARKETING STRATEGY_	COMPETITION	DIGITAL TRANSFORMATION_
SP5		0.714		
SP6		0.715		
SP7		0.707		
SP8		0.881		
P1			0.875	
P2			0.878	
P3			0.762	
P4			0.861	
P5			0.651	
P6			0.608	
P7			0.697	
P8			0.711	
TD1				0.874
TD2				0.819
TD3				0.789
TD4				0.607
TD5				0.810
TD6				0.879

Source: Smart PLS Program Output. 3.0, 2024

Based on the data in [table 1](#), the value can be seen *outer loading* the lowest in the outer model test results of this study is 0.607 which is in the TD4 indicator (Digital Transformation statement no. 4). Referring to the previously determined outer loading limit of 0.7. However, in the scale

development stage research, loading 0.60 is still acceptable, so these results indicate that the model is stated to meet the assumption of convergent validity because the lowest outer loading value obtained is $0.607 > 0.6$.

Table 2. Construct Validity and Reliability

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
HUMAN RESOURCES_	0.899	0.912	0.922	0.662
MARKETING STRATEGY_	0.905	0.932	0.922	0.599
COMPETITION	0.898	0.931	0.916	0.580
DIGITAL TRANSFORMATION_	0.886	0.900	0.914	0.642

Source: Smart PLS Program Output. 3.0, 2025

The data in [Table 2](#) above shows that the lowest AVE value of the 3 variables is 0.580 which is owned by the competition

variable. This result shows that the four research variables have met the assumption of discriminant validity because the lowest AVE value obtained is

more than 0.5. Meanwhile, the results of the cronbach alpha and composite reliability show that the lowest values are 0.898 and 0.916 owned by the competition variable. Thus, these results have also proven that all variables meet the assumption of reliability construct because the lowest cronbach alpha and composite reliability values are > 0.7.

After conducting the outer model test, the next step is to evaluate the final structural equation model (inner model). The inner model test of this study was conducted by looking at the path coefficient and R square values as follows in [table 3](#).

Table 3. R Square

	R Square	R Square Adjusted
DIGITAL TRANSFORMATION_	0.382	0.356

Source: Output of Smart PLS Program. 3.0, data processed by the author 2025

Based on [table 3](#) above, it shows that the value *R Square* for the variable for the digital transformation variable is 0.382, the acquisition explains that the percentage of digital transformation is 38.2%. This means that the HR variable, the Marketing

Strategy variable and the Competition variable have an effect on digital transformation of 38.2% and the remaining 61.8% is influenced by other variables.

Table 4. Inner Model test results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
HUMAN RESOURCES_ -> DIGITAL TRANSFORMATION_	0.526	0.523	0.100	5,284	0,000
MARKETING STRATEGY_ -> DIGITAL TRANSFORMATION_	0.056	0.074	0.128	0.437	0.662
COMPETITION -> DIGITAL TRANSFORMATION_	0.150	0.174	0.100	1,496	0.135

Source: Output of Smart PLS Program. 3.0, data processed by the author 2025

Based on [table 4](#) above, the results of the evaluation of the structural equation model of the relationship between variables are partially explained by the values *path coefficient* can be described as follows:

- 1) *Path coefficient* hypothesis 1, namely the HR variable on Digital Transformation, is obtained at 0.526. This value

shows that there is an influence of 52.6%. This result also means that the better the HR, the better the digital transformation.

- 2) The path coefficient value in hypothesis 2, marketing strategy towards Digital Transformation is obtained at 0.056. This value shows that marketing strategy has an

influence of 5.6% on Digital Transformation. This result also means that the better the marketing strategy, the higher the role of Digital Transformation.

- 3) The path coefficient value in hypothesis 3, namely competition against digital transformation, is obtained at 0.150. This value shows that competition has an influence of 15% on digital transformation.

Hypothesis Testing

This study has 3 hypotheses as the research questions that have been formulated and need to be tested for their truth. Hypothesis testing in this study uses the t-test, namely by comparing the t-statistic value obtained from the bootstrapping test with the critical limit of the t-table value of 1.992 at a significance level of 5% (0.05). The results of the hypothesis test of this study are presented as follows in [figure 3](#).

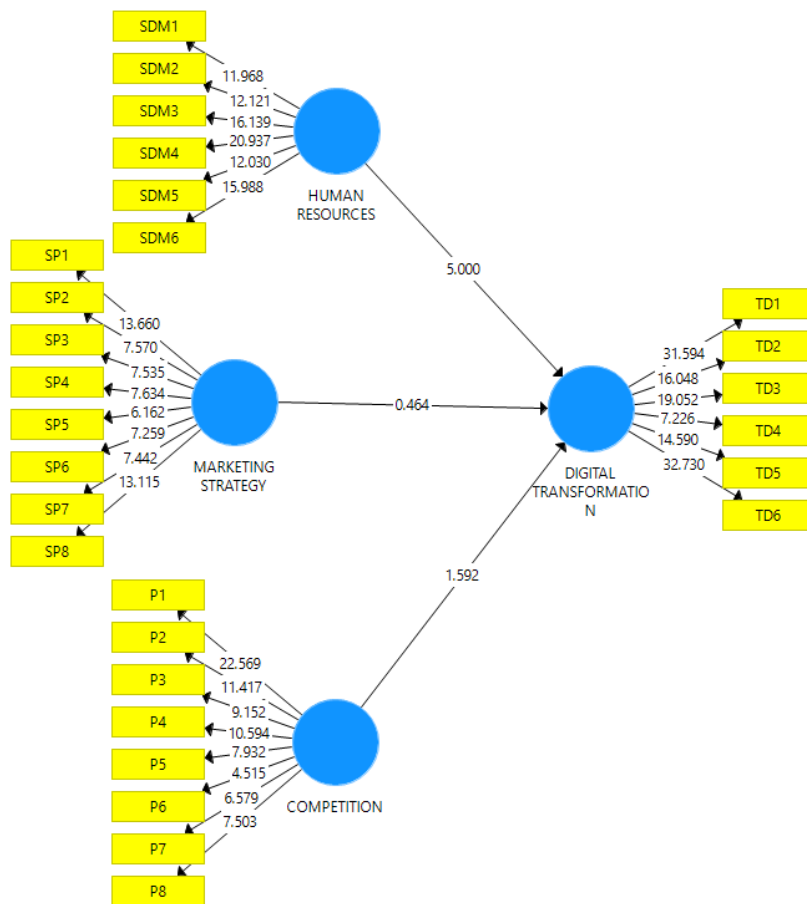


Figure 3. Inner Model, Bootstrapping Testing

Source: Data processed by the author, 2025

Table 5. Hypothesis Test Results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Information
HUMAN RESOURCES_ -> DIGITAL TRANSFORMATION_	0.526	0.523	0.100	5,284	0,000	Accepted
MARKETING STRATEGY_ -> DIGITAL TRANSFORMATION_	0.056	0.074	0.128	0.437	0.662	Rejected
COMPETITION -> DIGITAL TRANSFORMATION_	0.150	0.174	0.100	1,496	0.135	Rejected

Source: Output of Smart PLS Program. 3.0, data processed by the author 2025

Based on the PLS output (bootstrapping test) presented in [Table 5](#), it can be explained that:

- 1) Hypothesis 1: From the original sample value of 0.526, the t-statistic value of 5.284 and the P-value of 0.000 were obtained. These results prove that HR has a direct effect on Digital Transformation with a relationship value of 52.6%. The t-statistic value of 5.284 > t table 1.992 and the P-value of 0.000 < 0.05 prove that hypothesis 1 in this study is accepted.
- 2) Hypothesis 2: From the original sample value of 0.056, the t statistic value is 0.437 < 1.992 and the P-value is 0.662. These results prove that direct marketing strategies do not have a significant effect on Digital transformation with a relationship value of 5.6%. The t statistic value of 0.437 > t table 1.992 and the P-value of 0.662 > 0.05 prove that hypothesis 2 in this study is rejected.
- 3) Hypothesis 3: From the original sample value of 0.150, the t statistic value is 1.496 < 1.992 and the P-value is 0.135. These results prove that competition has a direct

significant effect on digital transformation with a relationship value of 15%. The t statistic value of 1.496 < t table 1.992 and the P-value of 0.135 > 0.05 prove that hypothesis 3 in this study is rejected.

This discussion section has been strengthened to integrate theoretical frameworks with the empirical results, rather than simply restating the statistical findings. For example, the non-significant relationship between marketing strategy and digital transformation suggests that digital adoption in logistics companies may be driven more strongly by internal organizational readiness, leadership commitment, and technological capabilities, which aligns with the Technology-Organization framework [17].

In this context, marketing strategies may play an indirect role, influencing transformation through innovation and customer orientation, rather than serving as a direct driver. This interpretation is supported by previous studies showing that while marketing strategies are critical for market positioning, they often do not directly trigger internal transformation efforts. By emphasizing these theoretical

connections, this study provides a richer understanding of the mechanisms influencing digital transformation.

CONCLUSION

Based on the results of the research that has been conducted and the data analysis as explained in the previous chapter, the following conclusions can be drawn. Digital transformation in logistics companies has an impact on HR in international trade. Digital transformation of logistics companies does not have an impact on marketing strategies in international trade. Digital transformation of logistics companies does not impact competition in international trade. Based on the conclusions outlined above, the researcher makes the following suggestions. Digital transformation has been proven to have an impact on human resources, logistics companies are advised to continue to

















develop digital training, mastery of information technology, and adaptation to digital-based logistics systems to increase the competitiveness of human resources in the international trade arena. The results of the study show that digital transformation has not had a significant impact on marketing strategies. Therefore, companies need to re-evaluate their strategy of utilizing technology in marketing, such as the use of digital platforms, customer analytics, and more aggressive social media-based campaigns. Digital transformation has not shown any impact on competition in international trade, so a more in-depth analysis is needed regarding other factors that may have a greater influence, such as export-import regulations, global logistics infrastructure, and international cooperation.

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BIOGRAPHIES OF AUTHORS

Author 1	
	<p>Nurmin Arianto    holds a Doctor of Marketing Management degree from Pakuan University, Bogor 2023. He also received his S.E., and M.M . (Management) from Pamulang University, Tangerang Selatan in 2012 and 2015, respectively. He is currently an Lektor at Magister Management in Pamulang University. His research includes marketing management. He can be contacted at email: dosen01118@unpam.ac.id.</p>
Author 2	
	<p>Dr. Kasmad S.E., M.M.,    born in Purbalingga on April 2 1968, is an Associate Professor with NIDN 0402046806. He completed his undergraduate education at the Open University (2005), master's at Pamulang University (2011), and doctorate at Persada Indonesia YAI University (2017) . Currently active as a Permanent Lecturer at Pamulang University since 2013, also acting as an Environmental Consultant and CV Manager. Gift of Prosperous Blessings. Previously, he had a career at the Open University as an Honorary and at PT Triple Ace Corporation as Accounting Supervision.</p>
Author 3	
	<p>Lia Asmah,    Graduated with a Bachelor's Degree in Education in 2012, majoring in Mathematics Education, and completed a Master's Degree in Human Resource Management in 2016. Currently serving as a full-time lecturer at Pamulang University. Email dosen01644@unpam.ac.id</p>
Author 4	
	<p>Windy Gustia Wardani    Graduated with a Bachelor of Public Health (S.KM.) from Muhammadiyah Prof. Dr. Hamka University in 2013, majoring in Environmental Health. Graduated with a Bachelor of Economics (S.E.) from Sekolah Tinggi Ilmu Ekonomi Bisnis jurusan Manajemen in 2023, majoring in Management. Graduated with a Master of Management (M.M.) from Pamulang University in 2016, specializing in Human Resources Management (HRM). Contact email: dosen01579@unpam.ac.id</p>