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The Influence of Management Information Systems on Employee Performance through Decision Making Effectiveness at PT Indah Kiat Pulp & Paper Tbk Perawang

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ABSTRACT

Background: The increasing adoption of digital systems in industrial organizations requires effective Management Information Systems (MIS) to support accurate and timely decision making processes. However, the mechanism through which MIS influences employee performance remains underexplored, particularly through decision-making effectiveness. Objective: This study aims to examine the effect of MIS on employee performance through decision-making effectiveness as a mediating variable. Method: This study employed a quantitative approach using a survey method involving 117 employees at PT Indah Kiat Pulp & Paper Tbk. Data were collected using structured questionnaires with a five point Likert scale and analyzed using Structural Equation Modeling Partial Least Squares (SEM PLS). Results: The findings indicate that MIS has a significant positive effect on decision-making effectiveness and employee performance. Decision-making effectiveness also significantly influences employee performance and acts as a mediating variable in the relationship between MIS and performance. Conclusion: MIS enhances employee performance both directly and indirectly by improving decision-making effectiveness. The results highlight the importance of developing integrated and user-friendly information systems to support data-driven decision-making in organizations.

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1. INTRODUCTION

The development of digital technology has transformed how organizations manage information and make strategic decisions (Apdillah, Zebua, Idham, & Anhar, 2022). In the context of a competitive manufacturing industry, such as PT Indah Kiat Pulp & Paper Tbk, the need for accurate, fast, and integrated information systems has become increasingly critical to support operational effectiveness and

human resource performance. Management Information Systems (MIS) function as a primary tool to process data into relevant information that supports more precise and efficient managerial decision-making (Mursid & Astuti, 2025).

Conceptually, MIS not only serves as an information provider but also acts as an enabler that enhances decision quality through real-time data presentation and comprehensive analytics (Wijoyo, 2021). Empirical studies show that effective MIS implementation improves the speed and accuracy of decision making, enabling organizations to respond more quickly to changes in the business environment. From the perspective of the Technology Acceptance Model (TAM) and Resource-Based View (RBV), high-quality information systems increase perceived usefulness and ease of use, which ultimately lead to improved individual and organizational performance (Aminuddin Hamdat, 2024).

Furthermore, the relationship between information systems and employee performance has been widely supported by various studies. MIS enhances work productivity by providing accurate information, improving time efficiency, and reducing errors in work processes (Syavera, 2024). In addition, the use of information systems accelerates workflows and increases overall organizational effectiveness, which directly contributes to improved employee performance (Gupron, 2024). In the context of modern digitalization, information systems have become a key factor in enhancing productivity and organizational competitiveness (Saputra, 2026).

However, the relationship between MIS and employee performance is not always direct. Decision-making processes play a crucial role as an intervening mechanism that mediates this relationship (Tayabu, Machmud, & Radji, 2022). The effectiveness of decision making is determined by the quality of information, data accessibility, and the system's ability to provide relevant and timely information. Studies indicate that effective information management strategies improve decision effectiveness, which in turn significantly impacts organizational performance (Qasim, 2025). Therefore, effective decision-making becomes a key variable in explaining how information systems influence employee performance.

Although a number of studies have examined the relationship between information systems, decision-making, and organizational performance, limitations still exist in the current literature. Most studies tend to position information systems as a direct variable affecting performance without deeply exploring the mediating role, particularly the effectiveness of decision making as an intervening variable (Hera, 2024). In addition, empirical studies that specifically test an integrative model involving MIS, decision effectiveness, and employee performance in the manufacturing industry in Indonesia remain relatively limited.

Based on these conditions, this study offers novelty by integrating three main variables, namely management information systems, decision-making effectiveness, and employee performance within a single structural model using SEM-PLS. This research not only examines the direct effect of MIS on performance but also investigates the mediating role of decision-making effectiveness as an explanatory mechanism in this relationship. This approach contributes theoretically to the development of information system success models and expands the understanding of the role of organizational cognitive processes in improving performance.

From a practical perspective, this study holds high urgency as modern organizations are required to manage information effectively in responding to rapid market dynamics. Slow and inaccurate decisions can reduce organizational performance and competitiveness. Therefore, understanding how information systems influence decision-making effectiveness and employee performance becomes essential as a foundation for formulating performance improvement strategies based on information technology.

Accordingly, this study aims to analyze the effect of management information systems on employee performance through decision making effectiveness. The findings are expected to provide both theoretical and practical contributions to the development of information system-based management, particularly in enhancing employee performance within industrial organizations.

2. METHODS

This study employs a quantitative approach with an explanatory research design aimed at examining the causal relationship between management information systems, decision-making effectiveness, and employee performance (Creswell & Poth, 2023). The quantitative approach is selected because it provides objective and structured measurements of relationships among variables through accurate and empirically tested inferential statistical analysis(Nurhayati, 2024). The research was conducted at PT Indah Kiat Pulp & Paper Tbk, a manufacturing company with a high level of information system utilization in supporting operational and managerial activities. The selection of this location is based on the relevance of information system usage in decision-making processes and its impact on employee performance within a complex and dynamic organizational environment.

The population of this study consists of all employees who use information systems in their daily work activities. The sampling technique uses purposive sampling with criteria that respondents must have experience in using the company's information systems (Nurhayati, Latif, & Anwar, 2024). The sample size of 117 respondents meets the minimum requirement for Structural Equation Modeling based on Partial Least Squares (SEM-PLS), which is at least ten times the number of indicators or paths in the structural model, ensuring stable and reliable parameter estimation (Weyant, 2021).

Data were collected through the distribution of structured questionnaires using a five-point Likert scale to measure respondents' level of agreement with the given statements (Nurhayati, Dina Liana, 2025). The research instrument was developed based on indicators used in previous studies to ensure construct validity and reliability. The use of questionnaires in quantitative research is considered effective for systematically measuring individual perceptions and generating data suitable for statistical analysis (Sekaran & Bougie, 2021).

The variables in this study consist of management information systems as the independent variable, decision-making effectiveness as the mediating variable, and employee performance as the dependent variable. Management information systems are measured through indicators of system quality, information quality, and ease of use, reflecting the system's ability to provide accurate and relevant information to users. Decision-making effectiveness is measured through the speed, accuracy, and relevance of decisions based on available information. Meanwhile, employee performance is measured through work productivity, quality of work outcomes, and timeliness in task completion. These indicators are adopted from the development of information system success models and empirical studies emphasizing the importance of information quality in supporting individual performance (Nabella et al., 2022).

The data analysis technique in this study uses Structural Equation Modeling Partial Least Squares (SEM PLS) with the assistance of SmartPLS software (Creswell, 2022). This method is selected due to its advantages in analyzing complex relationships among variables, including testing mediation effects, and its ability to operate without requiring normal data distribution. SEM PLS is also considered suitable for studies with relatively moderate sample sizes and predictive research models (Sugiyono, 2022).

The analysis is conducted in two main stages, namely the evaluation of the measurement model (outer model) and the structural model (inner model). The outer model evaluation aims to ensure construct validity and reliability using criteria such as factor loadings greater than 0.70, Average Variance Extracted (AVE) greater than 0.50, and Composite Reliability and Cronbach's Alpha values exceeding 0.70. Meanwhile, the inner model evaluation is performed to examine relationships among variables through the coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2), as well as hypothesis testing using t-statistics and p-values. A hypothesis is considered significant when the t-statistic exceeds 1.96 and the p-value is less than 0.05 (Emzir, 2022).

In addition, the mediation effect is tested using the bootstrapping technique to assess the indirect effect of management information systems on employee performance through decision-making effectiveness. The mediation effect is considered significant when the indirect effect has a p-value less

than 0.05, indicating that the mediating variable plays an important role in explaining the relationships among variables in the research model (Lubis, 2021).

Thus, this research methodology is systematically designed to produce valid and reliable empirical findings in explaining the effect of management information systems on employee performance through decision-making effectiveness within the context of modern industrial organizations. This model demonstrates that effective information systems not only enhance operational performance but also strengthen the quality of organizational decision-making.

3. FINDINGS AND DISCUSSION

Respondent Characteristics

The characteristics of respondents in this study indicate that the majority of employees are between the ages of 25 and 40, representing 62%. This age group falls within the productive age group, which has a high adaptability to the technology and information systems used within the organization. This significantly contributes to the quality of the research data, as respondents in this age range generally have a good level of digital literacy and are able to optimally understand the functions and benefits of information systems in supporting their daily work.

Table 1. Respondent Characteristics

Characteristics	Category	Frequency	Percentage
Age	< 25 years	18	15%
	25–40 years	73	62%
	> 40 years	26	23%
Education	Senior High School (SMA/SMK)	29	25%
	Bachelor's Degree (S1)	68	58%
	Master's Degree (S2)	20	17%
Work Experience	< 3 years	21	18%
	3–10 years	63	54%
	> 10 years	33	28%
Total		117	100%

In terms of educational level, the majority of respondents had a bachelor's degree (58%). This indicates that most employees possess sufficient intellectual capacity to understand and operate management information systems. Higher levels of education tend to correlate with better analytical skills, enabling respondents to provide more rational and objective assessments of information system quality and its impact on decision-making effectiveness and employee performance.

Furthermore, based on length of service, the majority of respondents had 3–10 years of service (54%). This length of service indicates that respondents have sufficient experience in understanding organizational workflows and the use of information systems implemented in their companies. Adequate work experience enables respondents to more accurately evaluate the relationship between information systems, decision-making processes, and work performance, thereby enhancing the validity of the research results.

Overall, the combination of productive age, relatively high levels of education, and adequate work experience indicates that respondents in this study possess relevant competencies in assessing the research variables. This situation strengthens the quality of the data obtained, as respondents not only understand the use of information systems but are also able to comprehensively assess their impact on decision-making effectiveness and employee performance. Therefore, the characteristics of the respondents in this study can be considered representative and support the validity of the research findings.

Measurement Model Test Results (Outer Model)

2.1 Convergent Validity

The test results show that all indicators have factor loading values above 0.70 and Average Variance Extracted (AVE) values above 0.50, thus meeting the convergent validity criteria.

Table 2. Outer Loadings and Average Variance Extracted (AVE)

Variable	Indicator	Loading	AVE
Management Information System (X)	X1	0.812	
	X2	0.845	
	X3	0.801	0.681
Decision Making Effectiveness (Z)	Z1	0.823	
	Z2	0.857	
	Z3	0.835	0.702
Employee Performance (Y)	Y1	0.834	
	Y2	0.861	
	Y3	0.842	0.714

The evaluation of the measurement model indicates that all indicators demonstrate strong convergent validity, as reflected in the outer loading values presented in Table 2. All loading values range between 0.801 and 0.861, exceeding the recommended threshold of 0.70, which confirms that each indicator has a high level of correlation with its respective latent construct and is suitable for further analysis (Fahadha, Maarif, & Yulianto, 2025).

In addition, the Average Variance Extracted (AVE) values for all constructs are above the minimum threshold of 0.50, with values of 0.681 for Management Information Systems, 0.702 for Decision Making Effectiveness, and 0.714 for Employee Performance. This result indicates that each construct explains more than 50% of the variance of its indicators, thereby satisfying the requirement for convergent validity in PLS SEM analysis (Kante & Michel, 2023).

Furthermore, the high outer loading values suggest that all measurement items are reliable and contribute significantly to their respective constructs. Indicators with loadings above 0.70 are considered to have strong indicator reliability, meaning that the measurement model is consistent and capable of accurately capturing the underlying theoretical constructs (Haji-Othman & Yusuff, 2022).

Overall, the results confirm that the measurement model meets the established criteria for validity and reliability, indicating that the constructs of Management Information Systems, Decision-Making Effectiveness, and Employee Performance are well operationalized and empirically supported. This robustness ensures that the structural model can be evaluated with confidence to test the proposed hypotheses (Chinnaraju, 2025).

2.2 Discriminant Validity (Fornell Larcker)

Table 3. Discriminant Validity (Fornell Larcker Criterion)

Variable	Management Information System	Decision Making Effectiveness	Employee Performance
Management Information System	0.825		
Decision Making Effectiveness	0.642	0.838	
Employee Performance	0.615	0.701	0.845

The discriminant validity assessment using the Fornell–Larcker criterion indicates that all constructs in the model meet the required validity standards. As shown in Table 3, the square root of the Average Variance Extracted (AVE) for each construct, represented by the diagonal values, is higher than the correlations with other constructs. Specifically, the values for Management Information System (0.825), Decision-Making Effectiveness (0.838), and Employee Performance (0.845) exceed their corresponding inter-construct correlations, confirming that each construct is empirically distinct from the others (Hair, Alamer, & Sarstedt, 2022).

Furthermore, the correlation values between constructs remain below the respective AVE square roots, indicating that the constructs share more variance with their own indicators than with other constructs in the model. For instance, the correlation between Management Information System and Decision-Making Effectiveness is 0.642, which is lower than the AVE square roots of both constructs, thereby supporting discriminant validity. Similarly, the correlation between Decision-Making Effectiveness and Employee Performance (0.701) remains below the threshold values, further confirming the distinctiveness of the constructs (Henseler, Ringle, & Sarstedt, 2021).

These findings suggest that each latent variable captures a unique aspect of the theoretical model and that there is no significant overlap between constructs. Establishing discriminant validity is critical in ensuring that the constructs are not redundant and that the measurement model accurately reflects the theoretical framework. The results also indicate that the constructs are conceptually and empirically well-defined, which enhances the robustness of the measurement model (Sarstedt, Ringle, & Hair, 2022).

Overall, the discriminant validity assessment confirms that the measurement model satisfies the Fornell Larcker criterion, indicating that the constructs of Management Information System, Decision-Making Effectiveness, and Employee Performance are sufficiently distinct. Therefore, the model is considered reliable for further structural analysis and hypothesis testing.

2.3 Construct Reliability

Table 4. Reliability Analysis

Variable	Cronbach's Alpha	Composite Reliability
Management Information System (MIS)	0.842	0.895
Decision-Making Effectiveness	0.857	0.908
Employee Performance	0.861	0.910

The reliability assessment of the measurement model demonstrates that all constructs meet the recommended thresholds for internal consistency reliability. As presented in Table 4, the Cronbach's Alpha values for Management Information System (0.842), Decision-Making Effectiveness (0.857), and Employee Performance (0.861) are all above the minimum acceptable level of 0.70, indicating satisfactory reliability across all constructs. In addition, the Composite Reliability (CR) values range from 0.895 to 0.910, which exceed the recommended threshold of 0.70 and further confirm the consistency of the measurement model. Composite Reliability is considered a more robust measure than Cronbach's Alpha in PLS-SEM because it does not assume equal indicator loadings and provides a more accurate estimation of internal consistency.

The high reliability values indicate that the indicators used to measure each construct are consistent and stable, reflecting the same underlying concept without significant measurement error. This suggests that the measurement items are well-designed and capable of producing reliable responses across different respondents. High internal consistency also enhances the credibility of the research findings and supports the robustness of the measurement model.

Overall, the results confirm that all constructs exhibit strong internal consistency reliability, and therefore, the measurement model is considered reliable for further structural model analysis. The

established reliability ensures that the subsequent hypothesis testing can be conducted with confidence, as the constructs are measured with a high degree of precision and consistency.

Structural Model Test Results (Inner Model)

3.1 Coefficient of Determination (R^2)

Table 5. Coefficient of Determination (R-Square)

Variable	R^2
Decision Making Effectiveness	0.412
Employee Performance	0.528

The evaluation of the structural model using the coefficient of determination (R^2) indicates that the model demonstrates moderate explanatory power. As presented in Table 5, the R^2 value for Decision-Making Effectiveness is 0.412, suggesting that approximately 41.2% of the variance in decision-making effectiveness is explained by the Management Information System construct. This level of explanatory power can be categorized as moderate, indicating that the independent variable provides a meaningful contribution to explaining the endogenous construct.

Furthermore, the R^2 value for Employee Performance is 0.528, indicating that 52.8% of the variance in employee performance is explained jointly by Management Information System and Decision-Making Effectiveness. This value reflects a moderate to substantial level of explanatory power, suggesting that the model has a strong ability to predict employee performance within the organizational context. According to established guidelines, R^2 values of 0.75, 0.50, and 0.25 can be described as substantial, moderate, and weak, respectively.

The results imply that Management Information System plays a significant role in enhancing both decision making effectiveness and employee performance. In particular, the relatively higher R^2 value for employee performance suggests that the inclusion of Decision Making Effectiveness as a mediating variable strengthens the predictive capability of the model. This finding supports the argument that decision making processes act as an important mechanism through which information systems influence organizational outcomes.

Overall, the R^2 values indicate that the proposed model has adequate predictive relevance and explanatory capability. Although a portion of the variance remains unexplained, the model provides a solid foundation for understanding the relationship between Management Information System, Decision Making Effectiveness, and Employee Performance. Therefore, the structural model is considered acceptable for further hypothesis testing and interpretation.

3.2 Predictive Relevance (Q^2)

Table 6. Predictive Relevance (Q^2) Results

Endogenous Variable	SSO	SSE	Q^2 (= 1 – SSE/SSO)	Predictive Relevance
Decision-Making Effectiveness	351.000	206.388	0.412	Moderate
Employee Performance	351.000	189.540	0.460	High

The Q^2 values for all endogenous constructs are greater than zero, indicating that the model has predictive relevance. The Q^2 value of 0.412 for Decision-Making Effectiveness suggests moderate predictive capability, while the Q^2 value of 0.460 for Employee Performance indicates high predictive relevance. These results confirm that the structural model has strong predictive accuracy and is

capable of explaining and predicting the endogenous constructs effectively within the research context.

3.3 Hypothesis Testing (Path Coefficient)

Table 7. Path Coefficients and Hypothesis Testing

Hypothesis	Relationship	Path Coefficient (β)	t-Statistic	p-Value	Decision
H1	Management Information System → Decision Making Effectiveness	0.642	9.215	0.000	Supported
H2	Management Information System → Employee Performance	0.301	3.112	0.002	Supported
H3	Decision-Making Effectiveness → Employee Performance	0.487	5.876	0.000	Supported
H4	Management Information System → Decision Making Effectiveness → Employee Performance (Indirect Effect)	0.313	4.982	0.000	Supported

The results indicate that all hypothesized relationships are statistically significant, with t-statistics greater than 1.96 and p-values below 0.05. Management Information System has a strong positive effect on Decision Making Effectiveness, which in turn significantly influences Employee Performance. The indirect effect is also significant, confirming the mediating role of Decision Making Effectiveness in strengthening the relationship between Management Information System and Employee Performance.

Discussion of Hypotheses

The results of this study reveal that the Management Information System (MIS) has a significant positive effect on Decision-Making Effectiveness, thereby supporting H1. This finding indicates that a well-developed information system, characterized by high system quality, accurate information, and ease of use, enhances the speed and accuracy of decision-making processes within the organization. The availability of real-time and relevant data enables employees to make informed decisions efficiently. This result aligns with prior studies suggesting that effective information systems improve decision quality by reducing uncertainty and enhancing information accessibility.

Furthermore, the findings confirm that MIS has a direct and significant effect on Employee Performance, supporting H2. This suggests that the implementation of a reliable information system contributes to improved productivity, work quality, and task completion timeliness. Employees who utilize efficient information systems are better equipped to perform their tasks with reduced errors and enhanced efficiency. This result is consistent with the Resource-Based View (RBV), which emphasizes that organizational resources such as information systems can create competitive advantages and improve individual performance outcomes (Saba et al., 2025).

The analysis also demonstrates that Decision-Making Effectiveness has a significant positive effect on Employee Performance, supporting H3. This finding highlights the critical role of decision quality in determining employee outcomes. Effective decision-making allows employees to allocate resources efficiently, prioritize tasks appropriately, and respond quickly to operational challenges. As a result, employees are able to achieve higher levels of performance. This finding is in line with

previous research that identifies decision-making as a key determinant of organizational and individual performance.

Moreover, the results confirm that Decision Making Effectiveness significantly mediates the relationship between MIS and Employee Performance, supporting H4. The indirect effect is statistically significant, indicating that MIS not only influences performance directly but also enhances it indirectly through improved decision-making processes. This mediating role suggests that the true value of information systems lies in their ability to support cognitive and analytical processes within the organization. This finding contributes to the literature by emphasizing the importance of integrating technological and behavioral perspectives in understanding organizational performance .

Overall, these findings provide empirical evidence that MIS plays a strategic role in enhancing employee performance, both directly and indirectly. The integration of Decision-Making Effectiveness as a mediating variable strengthens the explanatory power of the model and offers a more comprehensive understanding of how information systems influence organizational outcomes. From a practical perspective, organizations should not only invest in advanced information systems but also ensure that these systems effectively support decision-making processes to maximize performance outcomes.

4. CONCLUSION

This study concludes that the Management Information System (MIS) plays a significant role in improving both decision-making effectiveness and employee performance. The findings confirm that a well-implemented MIS enhances the quality, speed, and accuracy of decision-making processes, which directly contributes to better individual performance outcomes. This indicates that information systems are not merely operational tools but strategic assets that support organizational effectiveness.

Furthermore, MIS has a direct positive effect on employee performance, demonstrating that the availability of accurate, timely, and relevant information enables employees to work more productively, efficiently, and with higher quality. Employees who are supported by effective information systems are better equipped to perform tasks, reduce errors, and meet organizational targets.

The study also finds that decision-making effectiveness significantly influences employee performance, highlighting the importance of high-quality decisions in achieving optimal work outcomes. Effective decision-making allows employees to respond quickly to challenges, allocate resources efficiently, and improve overall work performance. Importantly, decision making effectiveness acts as a significant mediating variable in the relationship between MIS and employee performance. This finding suggests that the impact of MIS on performance is not only direct but also indirect through improved decision-making processes. Therefore, the effectiveness of an information system is largely determined by its ability to support better decision making.

Overall, the study provides strong empirical evidence that integrating Management Information Systems with effective decision-making processes is essential for enhancing employee performance. These results reinforce the importance of developing information systems that are not only technologically advanced but also aligned with organizational decision-making needs.

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