THE INFLUENCE OF MANAGEMENT INFORMATION SYSTEM EFFECTIVENESS AND USERS' TECHNICAL COMPETENCE ON INDIVIDUAL PERFORMANCE AT PT PINDAD ENJINERING INDONESIA (PT PEI)

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Abstract

This study examines the influence of Management Information System (MIS) effectiveness and users' technical competence on individual performance among employees of PT Pindad Enjiniring Indonesia (PT PEI). The company aims to enhance employee performance through the optimization of an integrated management information system and the development of users' technical capabilities. The research employs a verificative method using a total population survey approach (n = 32), with data collected through a Likert-scale questionnaire. Data analysis was carried out using multiple linear regression, supported by validity, reliability, classical assumption tests, t-test, F-test, and the coefficient of determination (R^2). The results reveal that MIS effectiveness significantly influences individual performance by 34.16%, users' technical competence contributes 38.94%, and both variables simultaneously affect individual performance by 73.1%, while the remaining 26.9% is attributed to other factors not examined in this study. These findings highlight that enhancing MIS effectiveness and users' technical competence plays a vital role in improving individual employee performance within the manufacturing industry context.

Keywords: Management Information System Effectiveness, Users' Technical Competence, Individual Performance

INTRODUCTION

The development of information technology in the digital era has become a key driver of organizational competitiveness and effectiveness. According to the World Economic Forum (2021), over 70% of global companies accelerated business digitalization after the COVID-19 pandemic. In Indonesia, the Central Bureau of Statistics (BPS, 2023) reported that 78.4% of medium and large enterprises have implemented computerized information systems to support managerial processes, production, and decision-making. This trend underscores the growing importance of Management Information System (MIS) effectiveness in ensuring efficiency, transparency, and information accuracy as foundations for sound organizational decisions. An effective MIS enhances interdepartmental coordination, optimizes resource use, and improves strategic decision-making accuracy. MIS effectiveness also aligns with the Sustainable Development Goals (SDGs), particularly Goal 8 (Decent Work and Economic Growth) and Goal 9 (Industry, Innovation, and Infrastructure), which emphasize productivity and innovation through sustainable technology. Strengthening MIS thus improves both organizational performance and sustainable economic development.

PT Pindad Enjiniring Indonesia (PT PEI), a subsidiary of PT Pindad (Persero) engaged in manufacturing and engineering services, is part of Indonesia's strategic industry adapting to integrated digital systems. The implementation of an Enterprise Resource Planning (ERP)-based MIS at PT PEI aims to enhance data management, inter-unit coordination, and information-based decisions. However, effectiveness depends not only on system sophistication but also on users' technical competence in operating and optimizing it. Individual performance reflects how well the system supports users' tasks and responsibilities. Employees with strong technical skills can better manage and optimize system functions, producing more accurate and efficient outputs. Conversely, limited competence may hinder utilization and reduce performance. Therefore, it is essential to examine how MIS effectiveness and users' technical skills influence individual performance, especially within manufacturing industries emphasizing efficiency and precision such as PT PEI.

Previous studies reinforce this topic's relevance. Choe (2020) found that MIS effectiveness positively affects individual performance through improved information accessibility and quality. Alzoubi (2021) emphasized users' technical competence as crucial for MIS success. Handayani and Rahmawati (2022) showed that user expertise and technological sophistication jointly enhance system effectiveness and employee performance. Similarly, Putri et al. (2023) noted that human resource quality and technology utilization significantly influence MIS effectiveness and organizational outcomes. Based on these insights, this study analyzes the influence of MIS effectiveness and users' technical competence on individual performance at PT Pindad Enjiniring Indonesia (PT PEI). The research is expected to provide practical contributions for improving user competence and system effectiveness, as well as theoretical insights for advancing MIS research supporting the Sustainable Development Goals (SDGs).

REVIEW OF LITERATURE

Effectiveness of Management Information Systems

Nandina and Firdaus (2024) explain that a Management Information System (MIS) is an essential part of modern organizations because it integrates data from various sources to support effective and efficient decision-making. The effectiveness of an MIS indicates how well an organization achieves its goals through optimal system utilization. According to Yogi Primadasa et al. (2023), MIS effectiveness can be assessed through several key indicators, including the quality of information (completeness and reliability), system quality (flexibility and integration), service quality (assurance), usage (daily use), user satisfaction (information satisfaction and perceived effectiveness), and net benefits reflected in overall work performance.

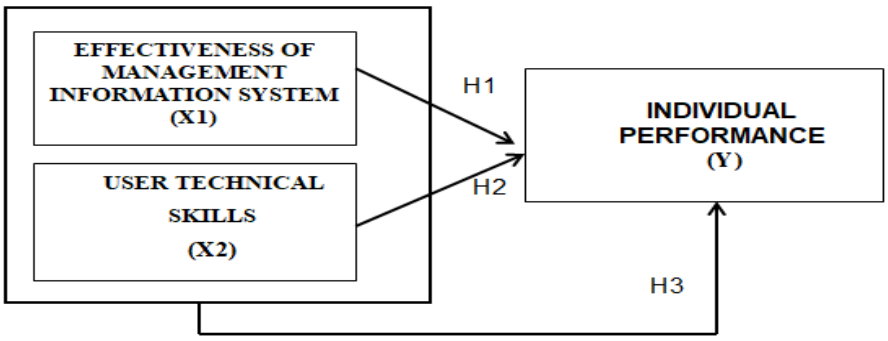
User Technical Competence

According to Maryani (2020), user technical competence refers to an individual's ability to operate a management information system in order to accomplish assigned tasks. The term *competence* derives from the word *able*, meaning the power or capability to perform specific tasks. It reflects an individual's confidence and proficiency in completing various job-related responsibilities. J. Hlavac (2023) further classifies user technical competence into three essential components: knowledge, skills, and abilities/capabilities.

Individual Performance

According to Alif and Rahmawati (2020), individual performance refers to a person's ability to produce high-quality and timely outcomes through the optimal utilization of organizational resources. It can also be defined as the results of task completion entrusted to an individual, which are influenced by personal characteristics, work environment, and emotional intelligence. Bintoro and Daryanto (2017) further explain that the dimensions of individual performance include work results, achievement level, and target attainment.

Research Model



Hypotheses

H1: Management Information System (MIS) effectiveness has a significant influence on individual performance at PT Pindad Enjiniring Indonesia.

H2: Users' technical skills have a significant influence on individual performance at PT Pindad Enjiniring Indonesia.

H3: Management Information System (MIS) effectiveness and users' technical skills simultaneously have a significant influence on individual performance at PT Pindad Enjiniring Indonesia.

RESEARCH METHOD

Research Object

The object of this study focuses on the Effectiveness of the Management Information System and User Technical Skills as the independent variables (X), and Individual Performance as the dependent variable (Y).

Type of Research

This study employs a verificative approach using a survey method. According to Arikunto (2021), verificative research aims to measure, test, and empirically verify the relationships among variables, while a survey method involves collecting data from respondents through questionnaires or other structured instruments to obtain the necessary information.

Population and Sample

The population refers to the entire group of elements or research subjects that constitute the focus of the study, from which data are collected and analyzed to answer the research problem (Creswell & Creswell, 2023). In this study, the population comprises all employees of PT Pindad Enjiniring Indonesia in Bandung who utilize the Management Information System (MIS) in their operational activities.

The sample represents a subset of the population selected for analysis to reflect the characteristics of the entire group (Creswell & Creswell, 2023). Given that the population in this study is relatively small, the researcher employed a total sampling (census) technique, in which all members of the population are included as research samples. Based on company records, the total population consists of 32 employees, and therefore, all 32 employees were included as the research sample.

Table 1.
Operational Definitions of Variables

No	Variable	Definition	Dimension	Indicator	Scale	Item No
1	MANAGEMENT INFORMATION SYSTEM EFFECTIVENESS (X1)	According to Azhar Susanto (2021), the effectiveness of an management information system (MIS) is an integration of subsystems/components, both physical and non-physical, that are interrelated and work together to produce information that is accurate, complete, and fully supports user needs in business processes and tasks, presented in a timely manner and easily understood by users.	Information Quality	Completeness	Interval	1
				Reliability	Interval	2
			System Quality	System Integration	Interval	3
				System Flexibility	Interval	4
			Service Quality	Service Assurance	Interval	5
			Usage	Daily Usage	Interval	6
			Net Benefit	Work Performance	Interval	7
			User Satisfaction	Information Satisfaction	Interval	8
				Effectiveness	Interval	9

No	Variable	Definition	Dimension	Indicator	Scale	Item No
2	USER TECHNICAL COMPETENCE (X2)	According to Maryani (2020), user technical competence is an individual's ability to operate an management information system to accomplish assigned tasks.	Knowledge	Understand work procedures and system workflow	Interval	1
				Understand main functions and features of the system	Interval	2
			Skills	Able to operate the system independently	Interval	3
				Able to complete tasks quickly and accurately	Interval	4
			Ability/Capability	Able to adapt to changes in the system	Interval	5
				Able to solve technical or procedural problems independently	Interval	6
3	INDIVIDUAL PERFORMANCE (Y)	According to Alif & Rahmawati (2020), individual performance is defined as a person's ability to produce quality and timely output through optimal utilization of organizational resources.	Work Results	Quantity	Interval	1
				Quality	Interval	2
			Achievement Level	Effectiveness	Interval	3
			Target	Speed	Interval	4
				Accuracy	Interval	5
				Timeliness	Interval	6

Source: Compiled from various sources (2025)

Data Collection Techniques

The data in this study were collected through questionnaires developed based on findings from library research, online research, and field research. Data measurement employed a Likert scale, which is commonly used to assess the attitudes, opinions, and perceptions of individuals or groups toward social phenomena (Sugiyono, 2020, p. 93).

Table 2.
Likert Scale Weight / Score

No	Response Option	Weight / Score
1	Strongly Disagree	1

No	Response Option	Weight / Score
2	Disagree	2
3	Neutral	3
4	Agree	4
5	Strongly Agree	5

Source: Bryman, A., & Bell, E. (2021)

Data Analysis Method

Data were analyzed using multiple linear regression analysis, supported by validity testing, reliability testing, classical assumption testing, partial statistical testing (t-test), simultaneous statistical testing (F-test), and the coefficient of determination (R^2) test.

RESULTS AND DISCUSSION

The results of the validity and reliability tests indicate that the variables Management Information System Effectiveness (X_1), User Technical Competence (X_2), and Individual Performance (Y) are valid and reliable. This is evidenced by the achievement of the acceptable statistical standards, as presented below:

Table 3.
Validity and Reliability Test Results

Variable	Validity Standard	Realization	Cronbach's Alpha Reliability Standard	Realization
X_1 (Management Information System Effectiveness)	≥ 0.30	0.704 – 0.835	≥ 0.60	0.911
X_2 (User Technical Competence)	≥ 0.30	0.653 – 0.789	≥ 0.60	0.826
Y (Individual Performance)	≥ 0.30	0.643 – 0.859	≥ 0.60	0.831

Source: Processed Research Data (2025)

The results of the Classical Assumption Tests indicate that the data are normally distributed, with no signs of multicollinearity or heteroscedasticity. Therefore, it can be concluded that the regression model is free from assumption violations and fulfills the requirements of a good linear regression model.

The Multiple Linear Regression equation is formulated as follows:

$$Y = a+b1X1+b2X2$$

Based on the regression analysis, the following equation was obtained:

$$Y = 3{,}830 + 0{,}434X1 + 0{,}486X2$$

Where:

- a = 3.830 indicates that if Management Information System Effectiveness (X_1) and User Technical Competence (X_2) are both zero, the Individual Performance (Y) value will be 3.830.
- b_1 = 0.434 indicates that if Management Information System Effectiveness (X_1) increases by one unit while User Technical Competence (X_2) remains constant, Individual Performance (Y) will increase by 0.434 units.
- b_2 = 0.486 indicates that if User Technical Competence (X_2) increases by one unit while Management Information System Effectiveness (X_1) remains constant, Individual Performance (Y) will increase by 0.486 units.

The partial statistical test (t-test) is used to examine the partial effect of each independent variable, Management Information System Effectiveness (X_1) and User Technical Competence (X_2), on Individual Performance (Y). The criteria for the t-test are as follows:

1. If *t-count* < *t-table* and the significance value > 0.05, then H_0 is accepted and H_1 is rejected.
2. If *t-count* > *t-table* and the significance value < 0.05, then H_0 is rejected and H_1 is accepted.

The basis for decision-making in the partial *t*-test, based on the *t*-table value, is as follows:

t tabel = (α/2; n-k-1) = t tabel = (0,05/2 ; 32-2-1) = (0,025 ;29) = 2,045

Table 4.
Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.830	2.392	—	1.601	0.120
Effectiveness	0.268	0.085	0.434	3.153	0.004
Competence	0.469	0.133	0.486	3.531	0.001

a. Dependent Variable: Performance

Source: SPSS Output Version 29

Based on the results of the hypothesis testing presented in the table above, the following explanations can be made:

- The Management Information System Effectiveness (X1) variable has a significance value of 0.004 < 0.05 and a t-count of 3.153 > t-table of 2.045, indicating that the Effectiveness of the Management Information System variable has a significant partial influence on Individual Performance.
- The User Technical Competence (X2) variable has a significance value of 0.001 < 0.05 and a t-count of 3.531 > t-table of 2.045, indicating that the User Technical Competence variable also has a significant partial influence on Individual Performance.

Simultaneous F-Test (ANOVA)

Table 5.
ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	187.499	2	93.750	40.734
	Residual	69.046	30	2.302	
	Total	256.545	32		

a. Dependent Variable: **Performance**
b. Predictors: (Constant), **Competence**, **Effectiveness**

Source: SPSS Output Version 29

Based on the SPSS Output Version 29, it is shown that the variables Effectiveness of Management Information System and User Technical Competence have a significance value of 0.000 < 0.05 and an F-count of 40.734 > F-table of 3.34. Therefore, it can be concluded that both variables simultaneously have a significant effect on Individual Performance at PT Pindad Enjiniring Indonesia (PT PEI). The Partial Coefficient of Determination test (r^2) is used to determine which independent variable has the most dominant influence on the dependent variable. The independent variable with the largest r^2 value is considered to have the greatest impact.

The contribution of each independent (predictor) variable to the dependent variable in a regression analysis is referred to as the Effective Contribution (SE). The total of all effective contributions from the independent variables equals the Coefficient of Determination (R^2) value. Meanwhile, the measure that indicates the proportion of each predictor variable's contribution to the Regression Sum of Squares is known as the Relative Contribution (SR), where the total relative contribution of all independent variables equals 100% (or 1). The formulas used are as follows:

Table 6.
Partial Coefficient of Determination (r^2) Test Results

Variable	Regression Coefficient (Beta)	Correlation Coefficient (r)	Effective Contribution (SE)	Relative Contribution (SR)	R Square
X_1 (Effectiveness of Management Information System)	0.434	0.787	34.16%	46.72%	73.10%
X_2 (User Technical Competence)	0.486	0.801	38.94%	53.28%	

Source: SPSS Output Version 29

Based on the results of the coefficient of determination analysis, the effectiveness of the management information system (X_1) contributes 34.16% to individual performance, while the user technical competence (X_2) variable contributes 38.94%. The coefficient of

determination (R^2) value of 0.731 indicates that the combined contribution of management information system effectiveness and user technical competence to individual performance is 73.1%, whereas the remaining 26.9% is influenced by other factors not examined in this study.

CONCLUSION

The findings of this study confirm that all proposed hypotheses are accepted. The first hypothesis (H_1) demonstrates that the effectiveness of the Management Information System (MIS) significantly influences individual performance, contributing 34.16% to performance improvement. The second hypothesis (H_2) shows that user technical competence also has a significant effect, contributing 38.94% to individual performance. Meanwhile, the third hypothesis (H_3) reveals that the combined influence of MIS effectiveness and user technical competence accounts for 73.1% of the variation in individual performance, while the remaining 26.9% is affected by other factors not examined in this study. These results highlight the crucial role of both system effectiveness and users' technical skills in enhancing employee productivity and achieving organizational efficiency.

Suggestions

For the company, it is recommended to further optimize the effectiveness of the Management Information System and strengthen user technical competence through regular system updates, targeted training programs, and continuous mentoring. Such initiatives are expected to sustain improvements in employee performance and support the achievement of broader organizational objectives. For future researchers, it is suggested to investigate additional variables that may influence individual performance, such as work motivation, job satisfaction, or organizational environment, to provide a more comprehensive understanding of the factors shaping performance outcomes in a digitalized workplace.

Managerial Implications

Enhancing the effectiveness of the Management Information System and improving users' technical competence not only elevates individual performance but also strengthens the organization's adaptability, efficiency, and innovation capacity. These improvements position PT Pindad Enjiniring Indonesia to remain competitive and agile in the face of rapid technological change and industrial transformation.

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