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Information Technology Integration and Managerial Effectiveness of Job Training Institutes: A TOE Framework Analysis

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Abstract: Digital transformation urges Job Training Centers (*Lembaga Pelatihan Kerja* or LPK) to optimize the utilization of information technology (IT) to enhance organizational governance effectiveness. IT support encompassing technical infrastructure, software quality, internet connectivity, and human resource (HR) digital competencies is considered critical for improving managerial functions. This study aims to analyze the effect of IT support on the management of LPKs in Semarang Regency. A quantitative approach with an explanatory survey design was employed. The study population comprised administrators and instructors of LPKs in Semarang Regency. A sample of 109 respondents was selected through purposive sampling. Primary data were collected using Likert-scale questionnaires and analyzed using descriptive statistics, instrument validity and reliability tests, classical assumption tests, and simple linear regression analysis via IBM SPSS Statistics. The findings demonstrate that IT support has a positive and statistically significant effect on LPK management. This indicates that improving technology infrastructure, information systems, internet access, and digital competencies among managers significantly enhances the effectiveness of planning, organizing, executing, and controlling functions within the institution. Theoretically, this study reinforces the Technology-Organization-Environment (TOE) Framework by establishing technological readiness as a primary driver of organizational effectiveness. Practically, the results provide recommendations for LPK administrators and local government authorities to accelerate digital transformation through infrastructure enhancement, system integration, and HR capacity building to achieve more effective, efficient, and sustainable institutional governance.

Keyword: Digital Transformation, Information Technology Support, Job Training Centers, Management Performance, Technology-Organization-Environment (TOE).

Abstrak: Transformasi digital mendorong Lembaga Pelatihan Kerja (LPK) untuk mengoptimalkan pemanfaatan teknologi informasi (TI) guna meningkatkan efektivitas tata kelola organisasi. Dukungan TI yang mencakup infrastruktur teknologi, kualitas perangkat lunak, konektivitas internet, dan kompetensi digital sumber daya manusia (SDM) dipandang

penting dalam meningkatkan fungsi manajerial. Penelitian ini bertujuan untuk menganalisis pengaruh dukungan TI terhadap pengelolaan LPK di Kabupaten Semarang. Penelitian ini menggunakan pendekatan kuantitatif dengan desain survei eksplanatori. Populasi penelitian terdiri atas pengelola dan instruktur LPK di Kabupaten Semarang. Sampel sebanyak 109 responden dipilih menggunakan teknik purposive sampling. Data primer dikumpulkan melalui kuesioner berskala Likert dan dianalisis menggunakan statistik deskriptif, uji validitas dan reliabilitas instrumen, uji asumsi klasik, serta analisis regresi linear sederhana dengan bantuan IBM SPSS Statistics. Hasil penelitian menunjukkan bahwa dukungan TI berpengaruh positif dan signifikan secara statistik terhadap pengelolaan LPK. Temuan ini menunjukkan bahwa peningkatan infrastruktur teknologi, sistem informasi, akses internet, dan kompetensi digital pengelola secara signifikan meningkatkan efektivitas fungsi perencanaan, pengorganisasian, pelaksanaan, dan pengendalian dalam lembaga. Secara teoretis, penelitian ini memperkuat Technology-Organization-Environment (TOE) Framework dengan menegaskan kesiapan teknologi sebagai salah satu faktor utama yang mendorong efektivitas organisasi. Secara praktis, hasil penelitian memberikan rekomendasi bagi pengelola LPK dan pemerintah daerah untuk mempercepat transformasi digital melalui peningkatan infrastruktur, integrasi sistem, dan pengembangan kapasitas SDM guna mewujudkan tata kelola kelembagaan yang lebih efektif, efisien, dan berkelanjutan.

Kata Kunci: *Transformasi Digital; Dukungan Teknologi Informasi; Lembaga Pelatihan Kerja; Kinerja Manajemen; Technology-Organization-Environment (TOE).*

INTRODUCTION

The rapid advancement of information technology (IT) has accelerated digital transformation across education and workforce development sectors, with global digital adoption exceeding 67% of the world's population in 2024, thereby compelling vocational institutions to integrate digital technologies into organizational governance and service delivery to improve operational efficiency and institutional competitiveness (Bond et al., 2024). Digital transformation within *Lembaga Pelatihan Kerja (LPK)* has evolved beyond conventional administrative automation into a strategic management approach that supports data-driven planning, efficient resource allocation, instructional management, organizational monitoring, and evidence-based decision-making, ultimately enhancing institutional performance and training quality (Sánchez-Prieto et al., 2022).

Furthermore, the emergence of Industry 4.0 and Society 5.0 requires vocational education providers to establish integrated digital ecosystems capable of developing a technologically adaptive workforce equipped with advanced digital competencies, collaborative skills, and lifelong learning capabilities that align with rapidly changing labor market demands (Marnewick & Marnewick, 2023). Consequently, strengthening information technology implementation within vocational training institutions has become a strategic imperative for improving organizational resilience, governance effectiveness, service quality, and workforce readiness in an increasingly digital and knowledge-based economy (Pereira et al., 2021).

Indonesia has accelerated digital transformation within the labor sector by implementing integrated digital policies that strengthen workforce governance and expand equitable access to employment-related services, as reflected in the development of the SIAPkerja platform, which consolidates vocational training, competency certification, labor market information, and job-matching services into a unified digital ecosystem serving millions of prospective workers and employers nationwide (Azzahra et al., 2023). The integration of digital labor service platforms has become increasingly important because Indonesia's internet penetration reached approximately 79.5% of the population (221.6 million users) in 2024,

thereby creating substantial opportunities to improve accessibility, administrative efficiency, and the quality of public employment services through technology-driven innovations (APJII, 2024; Rahmawati et al., 2023).

Furthermore, recent evidence indicates that digital transformation in Technical and Vocational Education and Training (*TVET*) enhances institutional effectiveness by improving learning management systems, competency-based assessments, stakeholder collaboration, and alignment between workforce competencies and industrial demands, thereby increasing graduates' employability in an increasingly digital labor market (Alammery et al., 2022). Consistent with these developments, the *International Labour Organization (ILO)* emphasizes that the digitalization of institutional information systems, learning technologies, and public service standards constitutes a strategic prerequisite for strengthening governance, promoting inclusive workforce development, and improving the responsiveness of *TVET* systems to rapidly evolving labor market requirements (International Labour Organization, 2022).

The Semarang Regency Government has strengthened digital public service transformation by implementing the *SINONSKILL* platform to improve the efficiency of vocational training administration, participant management, and employment service integration, reflecting the broader digitalization agenda promoted in Indonesia's public sector (Sari et al., 2023). Digital transformation at the institutional level has become a strategic instrument for improving organizational performance, transparency, and service quality; however, empirical evidence indicates that disparities in technological infrastructure and digital capability remain major obstacles to effective implementation in many local public organizations (AlNuaimi et al., 2022). Within vocational training institutions (*Lembaga Pelatihan Kerja/LPKs*), variations in internet connectivity, software utilization, digital literacy of administrators and instructors, and information system integration generate considerable differences in operational effectiveness and managerial performance (Khin & Ho, 2023). Consequently, strengthening digital readiness across *LPKs* is essential to maximize the benefits of the *SINONSKILL* system and ensure sustainable improvements in institutional management, workforce development, and public service outcomes (Verhoef et al., 2021).

Effective organizational management requires integrated information systems to ensure accurate planning, efficient coordination, transparent implementation, and continuous monitoring, as organizations with strong digital governance consistently demonstrate higher operational efficiency and decision-making quality than those relying on fragmented information systems (AlNuaimi et al., 2022). Human resource competencies supported by information technology also strengthen administrative performance, improve organizational responsiveness, and facilitate evidence-based strategic decisions, thereby increasing institutional competitiveness in dynamic environments (Pratama et al., 2024). Moreover, the rapid advancement of *artificial intelligence* and digital information systems has transformed organizational processes by enabling real-time data analytics, predictive decision-making, and innovation-oriented management capable of improving organizational performance and service quality (Suryanto et al., 2025). Therefore, organizations must continuously develop digital infrastructure and dynamic capabilities because technology-driven workplaces have been empirically shown to enhance innovation, organizational agility, and long-term sustainable performance in increasingly complex institutional environments (Wibowo et al., 2024)..

Vocational education is undergoing rapid digital transformation; however, empirical evidence continues to emphasize instructional technology and learning outcomes while providing limited analysis of how information technology (*IT*) support strengthens managerial functions, including planning, organizing, implementation, and control within vocational training institutions, thereby highlighting a substantial governance-oriented research gap (Bond et al., 2022). Digital transformation has expanded across vocational education systems worldwide, yet most empirical investigations remain concentrated on public educational institutions, vocational high schools, and universities, whereas studies examining private

Lembaga Pelatihan Kerja (LPK) at the regency level remain limited despite their strategic contribution to regional workforce development and employment generation (UNESCO-UNEVOC, 2022). Furthermore, recent evidence indicates that organizational digitalization requires not only technological infrastructure but also effective managerial governance and institutional readiness to improve organizational performance, suggesting that contextual analyses of private vocational training providers remain insufficient within existing literature (Verhoef et al., 2021). Moreover, previous studies predominantly evaluate digital adoption through user acceptance, technology utilization, or learning satisfaction, while comprehensive assessments integrating managerial performance within the *Technology-Organization-Environment (TOE)* framework remain scarce, thereby justifying the need for further investigation into *IT* support and managerial effectiveness in private vocational training institutions (Baker, 2022).

This study addresses existing empirical and theoretical gaps by examining the influence of Information Technology (IT) support comprising hardware infrastructure, software quality, internet connectivity, and the digital competencies of human resources on managerial performance in private vocational training institutions (*Lembaga Pelatihan Kerja* [LPKs]) across Semarang Regency. Grounded in the Technology-Organization-Environment (TOE) Framework, the research conceptualizes technological readiness as a fundamental determinant of effective organizational governance and managerial effectiveness in vocational education institutions. The study contributes theoretically by extending the application of the TOE Framework to the context of private vocational training centers, thereby advancing the understanding of how technological capabilities interact with organizational governance to enhance managerial performance. Furthermore, it provides empirical evidence from a suburban/regency setting within a developing economy, which remains underrepresented in the management literature, while offering practical recommendations for LPK administrators and local government authorities, particularly the Semarang Regency Department of Manpower, to develop evidence-based digital transformation strategies through investments in technological infrastructure, integrated information systems, and systematic human resource digital capacity development.

METHOD

A. Research Design and Framework

This study adopts a quantitative approach with an explanatory survey design to empirically examine the causal relationship between Information Technology (IT) support and managerial effectiveness within Job Training Institutes (LPKs) in Semarang Regency. A quantitative paradigm was chosen as it enables objective hypothesis testing through numerical measurements and rigorous statistical inference. The explanatory survey design allows the researcher to quantify the magnitude of influence exerted by the independent variable (IT Support) on the dependent variable (LPK Management Effectiveness) within a natural organizational setting. Furthermore, this study employs a cross-sectional time horizon, wherein data collection occurred at a single, specific point in time. This approach captures the current state of IT infrastructure, digital competency, and managerial practices across the sample institutions, providing a reliable snapshot of digital transformation dynamics within vocational training governance.

B. Location and Operational Context

The empirical investigation was conducted across registered Job Training Institutes (*Lembaga Pelatihan Kerja* / LPK) operating under the formal oversight of the Department of Manpower (Dinas Tenaga Kerja) in Semarang Regency, Central Java Province. Semarang Regency was selected as the research location due to its strategic industrial landscape and the high institutional diversity among its LPKs, ranging from small-scale private training centers

to larger accredited institutes. Moreover, the local government's digital initiatives (such as the *SINONSKILL* platform) provide a relevant operational environment to evaluate how micro-level institutional IT readiness aligns with broader regional labor market digitalization policies.

C. Population and Sampling Methodology

1. Target Population

The target population comprises active administrative managers and instructional staff operating within officially registered LPKs in Semarang Regency. These individuals represent the operational core responsible for strategic planning, resource allocation, course execution, and institutional quality control.

2. Sampling Technique and Criteria

A non-probability purposive sampling technique was executed. Purposive sampling was essential to ensure that data were gathered exclusively from key organizational informants who possess direct exposure to, and operational reliance on, IT systems and managerial decision-making.

To maintain sample validity, respondents were screened against four strict inclusion criteria:

- a. Currently holding an active position as an LPK manager, administrator, or lead instructor.
- b. Possessing a minimum institutional tenure of one year (≥ 1 year) to ensure adequate familiarity with the organization's administrative workflows.
- c. Direct involvement in administrative governance, curriculum design, or training program execution.
- d. Routine utilization of IT infrastructure/systems in day-to-day work operations.

3. Sample Size Calculation

For known target populations, the minimum required sample size (n) is calculated using Slovin's Formula at a 5% margin of error ($\alpha = 0.05$):

$$n = \frac{N}{1 + N(e)^2}$$

Where:

- n = Required sample size
- N = Total target population size
- e = Margin of error (0.05)

Following systematic sampling and data screening procedures, the final analytical sample consisted of $n = 109$ eligible respondents (comprising 46 institutional managers/administrators and 63 active instructors), providing statistical power for bivariate regression and parametric assumption testing.

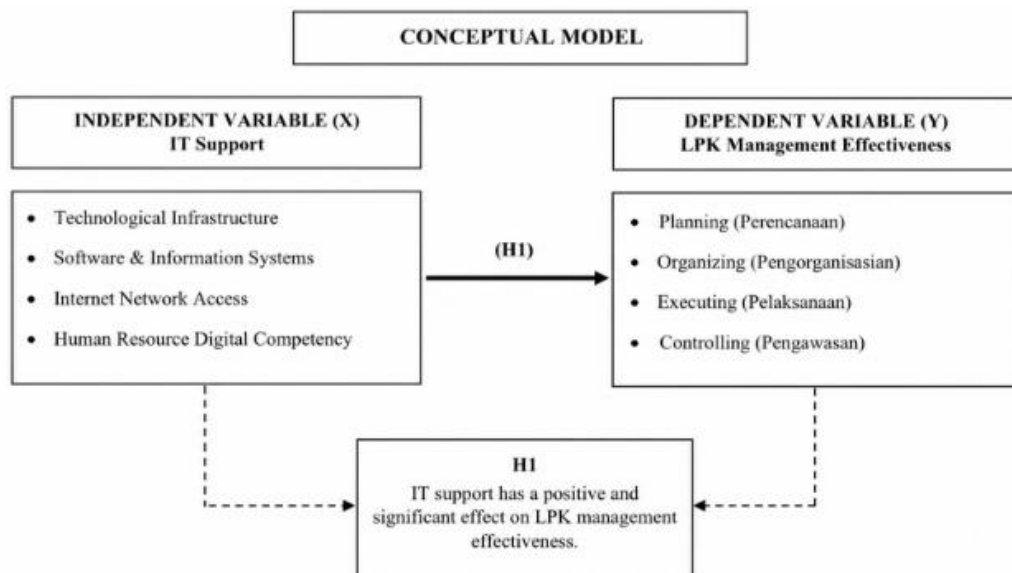


Figure 1. Conceptual Framework of the Effect of Information Technology Support on LPK Management Effectiveness

The conceptual framework illustrates the hypothesized relationship between Information Technology (IT) Support as the independent variable and LPK Management Effectiveness as the dependent variable. IT support is conceptualized through four dimensions: technological infrastructure, software and information systems, internet network access, and human resource digital competency, which are expected to enhance managerial functions, including planning, organizing, executing, and controlling within LPKs. Accordingly, the framework proposes Hypothesis 1 (H1), stating that information technology support has a positive and statistically significant effect on the effectiveness of LPK management in Semarang Regency.

D. Operational Definition of Variables

To ensure precise empirical measurement, the theoretical constructs were operationalized into concrete indicators based on prior literature and the Technology-Organization-Environment (TOE) Framework.

Table 1. Operationalization of Variables

Variable	Theoretical & Operational Definition	Sub-Dimensions / Indicators	Measurement Scale
IT Support (<i>Independent Variable / X</i>)	The degree of availability, quality, and utilization of technological resources provided by the LPK to facilitate administrative execution and organizational decision-making.	1. Technology Infrastructure: Hardware adequacy, computer networks, device availability. 2. Software & Systems: Application functional quality, system integration, database utility. 3. Internet Network: Connectivity speed, bandwidth stability, access coverage. 4. HR Digital Competency: Digital literacy, proficiency, and	5-point Likert Scale <i>(1 = Strongly Disagree to 5 = Strongly Agree)</i>

Variable	Theoretical & Operational Definition	Sub-Dimensions / Indicators	Measurement Scale
LPK Management Effectiveness (<i>Dependent Variable / Y</i>)	The capacity of the training institute to effectively and efficiently execute fundamental governance functions to achieve organizational targets.	adaptability of staff/instructors.	5-point Likert Scale (1 = <i>Strongly Disagree</i> to 5 = <i>Strongly Agree</i>)
		1. Planning: Data-driven program design, budgeting, goal setting.	
		2. Organizing: Resource division, role allocation, operational coordination.	
		3. Executing: Program implementation, instruction delivery, service administration.	
		4. Controlling: Real-time monitoring, outcome evaluation, reporting systems.	

E. Data Sources and Collection Procedures

This study gathered both primary and secondary data to establish empirical depth.

1. Primary Data Collection

Primary data were gathered using a highly structured, self-administered questionnaire. Instrument items were measured on a 5-point interval Likert scale. Questionnaires were distributed both physically and digitally to qualified respondents across LPKs in Semarang Regency.

2. Secondary Data Collection

Secondary data were compiled to complement primary empirical findings and provide macro-contextual anchoring. Sources included:

- Administrative records and institutional rosters from the Department of Manpower (Dinas Tenaga Kerja) of Semarang Regency.
- Institutional profile reports, organizational charts, and training logs from participating LPKs.
- Relevant statutory regulations, national TVET digitalization policies, and peer-reviewed international journal articles.

F. Instrument Quality Control

To guarantee measurement accuracy, preliminary field testing was conducted. The instrument undergone evaluation for both construct validity and internal consistency reliability prior to final hypothesis testing.

1. Validity Testing

Construct validity was evaluated using the Corrected Item-Total Correlation method in IBM SPSS. Each item's calculated correlation coefficient ($r_{\text{calculated}}$) was compared against the critical table value (r_{table}) at $\alpha = 0.05$.

$$\text{Decision Rule: } \begin{cases} r_{\text{calculated}} > r_{\text{table}} \text{ and } p < 0.05 & \Rightarrow \text{Valid} \\ r_{\text{calculated}} \leq r_{\text{table}} \text{ or } p \geq 0.05 & \Rightarrow \text{Invalid} \end{cases}$$

2. Reliability Testing

Internal consistency was evaluated using Cronbach's Alpha (α). A construct is determined reliable if the coefficient exceeds the standard psychometric threshold:

$$\text{Decision Rule: } \begin{cases} \alpha \geq 0.70 & \Rightarrow \text{Reliable} \\ \alpha < 0.70 & \Rightarrow \text{Unreliable} \end{cases}$$

G. Statistical Data Analysis Techniques

Data analysis was executed using IBM SPSS Statistics (Version 26.0). The statistical workflow followed a systematic three-stage progression:

1. Stage 1: Descriptive Statistical Analysis

Descriptive statistics were computed to summarize respondent demographic profiles and variable score distributions. Computed metrics include the arithmetic mean ($\bar{X}$), standard deviation (SD), minimum/maximum values, and percentage distributions. Mean score interpretations follow predefined interval categories ranging from *Very Poor* (1.00-1.80) to *Very Good* (4.21-5.00).

2. Stage 2: Classical Assumption Testing

Prior to running parametric linear regression analysis, data distributions were evaluated against three standard classical assumptions to prevent estimation bias:

a. Normality Test

Evaluates whether residual values in the regression model are normally distributed. This study used the One-Sample Kolmogorov-Smirnov test (supplemented by Shapiro-Wilk testing).

b. Multicollinearity Test

Assesses whether high inter-correlations exist among indicators within the model. Assessed via Tolerance and the Variance Inflation Factor (VIF).

c. Heteroscedasticity Test

Verifies whether the variance of residual terms remains constant across observations. Evaluated using the Glejser Test, regressing absolute residual values ($|e_i|$) against the independent variable.

H. Regression Analysis and Hypothesis Testing

1. Simple Linear Regression Model

To analyze the directional causal impact of IT Support (X) on LPK Management Effectiveness (Y), simple linear regression was conducted using the statistical formulation:

$$Y = \alpha + \beta X + e$$

Where:

- Y = Dependent Variable (LPK Management Effectiveness)
- α = Constant term (y-intercept)
- β = Unstandardized regression coefficient (slope measuring magnitude of impact)
- X = Independent Variable (IT Support)
- e = Stochastic error term

2. Hypothesis Testing (t -Test)

The primary hypothesis (H_1) was tested using a partial Student's t -test evaluated at a 95% confidence level ($\alpha = 0.05$).

- Null Hypothesis (H_0): $\beta = 0$ (IT support has no significant effect on LPK management effectiveness).
- Alternative Hypothesis (H_1): $\beta > 0$ (IT support has a positive and statistically significant effect on LPK management effectiveness).

3. Coefficient of Determination (Adjusted R^2)

To quantify the explanatory power of the empirical model, the Adjusted R -Squared (Adjusted R^2) statistic was derived. This value indicates the proportion of total variance in LPK Management Effectiveness (Y) explained by variations in IT Support (X), with the remaining variance ($1 - R^2$) attributed to unmeasured extraneous factors.

RESULT AND DISCUSSION

A. Demographic Profile of Respondents

The empirical analysis was conducted on a sample of $N = 109$ respondents, comprising active administrators and instructors across Job Training Institutes (*Lembaga Pelatihan Kerja* or LPK) in Semarang Regency. To provide a comprehensive context for data interpretation, respondent profile data were evaluated based on gender, age, educational attainment, organizational position, and tenure. The descriptive summary of respondent demographics is detailed in Table 2.

Table 2. Demographic Profile of Respondents

Demographic Category	Classification	Frequency (n)	Percentage (%)
Gender	Male	61	56.0
	Female	48	44.0
Age	< 30 years	18	16.5
	31 – 40 years	42	38.5
	41 – 50 years	33	30.3
	> 50 years	16	14.7
Educational Background	Senior High / Vocational School (SMA/SMK)	15	13.8
	Diploma (D3/D4)	24	22.0
	Bachelor's Degree (S1)	53	48.6
	Master's / Doctoral Degree (S2/S3)	17	15.6
Organizational Role	LPK Administrator / Management	46	42.2
	Instructor	63	57.8
Work Tenure	< 5 years	27	24.8
	5 – 10 years	44	40.4
	> 10 years	38	34.8

As shown in Table 2, the sample is marginally dominated by male professionals (56.0%), while female personnel account for 44.0%, reflecting a relatively balanced representation across managerial and technical functions. In terms of age distribution, the majority of respondents fall within the productive cohort of 31 – 40 years (38.5%) and 41 – 50 years (30.3%), indicating a mature workforce possessing adequate professional experience in vocational training administration. Furthermore, the workforce demonstrates high formal qualification levels, with 48.6% holding Bachelor's degrees and 15.6% possessing Master's or Doctoral degrees. Regarding professional role and tenure, instructors represent 57.8% of respondents, complemented by administrators at 42.2%, with over 75% of the total sample having served for more than 5 years. This profile confirms that the respondents possess sufficient background, organizational institutional knowledge, and competence to evaluate IT implementation and managerial operational effectiveness.

B. Instrument Validity and Reliability Evaluation

Prior to main hypothesis testing, the measurement instrument was subjected to construct validity and internal consistency reliability assessments. Validity was evaluated using the *Corrected Item-Total Correlation* (r_{count} vs. $r_{table} = 0.187$ at $\alpha = 0.05$, $df = 107$). All items across both variables yielded correlation values exceeding 0.350, confirming valid construct representation. Internal consistency was evaluated via *Cronbach's Alpha* (α). As reported in

Table 3, both variables achieved Cronbach's Alpha values significantly exceeding the empirical threshold of 0.70, indicating high measurement reliability.

Table 3. Reliability Analysis of Measurement Constructs

Variable	Code	Number of Items	Cronbach's Alpha (α)	Threshold	Measurement Status
Information Technology Support	X	16	0.892	> 0.70	Highly Reliable
LPK Managerial Effectiveness	Y	16	0.914	> 0.70	Highly Reliable

C. Descriptive Statistical Analysis

Descriptive statistics specifically mean scores and standard deviations were computed to measure respondents' perceptions regarding IT Support (X) and LPK Managerial Effectiveness (Y). Items were measured on a 5-point Likert scale ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree").

1. Information Technology Support (X)

The empirical evaluation of IT support encompasses four operational dimensions: technological infrastructure, software and information systems quality, internet connectivity quality, and digital competencies of personnel. Table 4 presents the descriptive metrics for Variable X.

Table 4. Descriptive Statistics for Information Technology Support (X)

Indicator Dimension	Mean (μ)	Std. Deviation (σ)	Interpretation
Technological Infrastructure	4.21	0.58	Very High / Excellent
Software & Information Systems	4.08	0.61	High / Good
Internet Connectivity Quality	3.94	0.67	High / Good
Digital Competence of Personnel	4.15	0.55	High / Good
Overall Composite Variable X	4.10	0.60	High / Good

The overall composite mean for IT Support stands at 4.10 ($\sigma = 0.60$), reflecting a strong foundation of technological integration across LPKs in Semarang Regency. The highest rated indicator is *Technological Infrastructure* ($\mu = 4.21, \sigma = 0.58$), demonstrating adequate availability of basic computer hardware, local networks, and workstation facilities. *Digital Competence of Personnel* also scored high ($\mu = 4.15, \sigma = 0.55$), indicating robust technological adoption capability among instructors and managers. Conversely, *Internet Connectivity Quality* registered the lowest score ($\mu = 3.94, \sigma = 0.67$), highlighting potential bandwidth limitations and connectivity stability issues that require infrastructural optimization.

2. LPK Managerial Effectiveness (Y)

Managerial performance was appraised across four classical management functions: planning, organizing, executing, and controlling. Table 5 summarizes the descriptive statistics for Variable Y.

Table 5. Descriptive Statistics for Managerial Effectiveness (Y)

Indicator Dimension	Mean (μ)	Std. Deviation (σ)	Interpretation
Planning (<i>Perencanaan</i>)	4.18	0.56	High / Good
Organizing (<i>Pengorganisasian</i>)	4.12	0.59	High / Good
Executing (<i>Pelaksanaan</i>)	4.09	0.63	High / Good
Controlling/Monitoring (<i>Pengawasan</i>)	3.97	0.68	High / Good

Indicator Dimension	Mean (μ)	Std. Deviation (σ)	Interpretation
Overall Composite Variable <i>Y</i>	4.09	0.62	High / Good

The composite mean score for LPK Managerial Effectiveness reached 4.09 ($\sigma = 0.62$). Among the four core functions, *Planning* scored highest ($\mu = 4.18, \sigma = 0.56$), indicating that IT integration effectively supports data-driven program design, scheduling, and target setting. The *Controlling/Monitoring* dimension recorded the lowest mean score ($\mu = 3.97, \sigma = 0.68$), suggesting that while institutional control mechanisms are functional, real-time tracking, automated evaluation systems, and integrated digital reporting require further development.

D. Diagnostic Classical Assumption Tests

To confirm the suitability of the data for Ordinary Least Squares (OLS) simple linear regression analysis, prerequisite diagnostic assumption tests were performed:

1. Normality Test: The Kolmogorov-Smirnov test yielded a test statistic of $Z = 0.062$ with a p -value ($Sig.$) of 0.200 ($p > 0.05$). Furthermore, standard P-P plot inspection confirmed that residuals were normally distributed along the diagonal reference line.
2. Linearity Test: The test for linearity between X and Y produced a *Deviation from Linearity* F -statistic of 1.124 with $p = 0.328$ ($p > 0.05$), validating a linear relationship between IT Support and Managerial Effectiveness.
3. Heteroscedasticity Test: The Glejser test was conducted by regressing absolute residuals ($|e|$) against Variable X . The resulting coefficient yielded $p = 0.241$ ($p > 0.05$), confirming the absence of heteroscedasticity variance in the disturbance terms.

E. Simple Linear Regression Analysis & Hypothesis Testing

A simple linear regression analysis was executed using IBM SPSS Statistics to evaluate the statistical impact of Information Technology Support (X) on LPK Managerial Effectiveness (Y). The statistical results are summarized in Table 6 and Table 7.

Table 6. Model Fit and Summary Statistics

Model	R	R Square (R ²)	Adjusted R Square	Std. Error of the Estimate	F-Change	Sig. F-Change (p)
1	0.684 ^a	0.468	0.463	0.4521	94.021	< 0.001

Predictors: (Constant), Information Technology Support (X)

Table 7. Linear Regression Parameter Estimates

Model Structure	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (β)	t-statistic	Significance (p)
(Constant)	1.214	0.298		4.074	< 0.001
IT Support (X)	0.701	0.072	0.684	9.696	< 0.001

Dependent Variable: LPK Managerial Effectiveness (Y)

From Table 7, the resulting linear regression equation is specified as follows:

$$Y = 1.214 + 0.701X + e$$

- a. Constant ($\alpha = 1.214$): Indicates that if IT Support (X) is equal to zero, the baseline level of LPK Managerial Effectiveness (Y) remains positive at 1.214 units.
- b. Regression Coefficient ($b = 0.701$): Demonstrates a positive direction of influence. For every 1-unit increase in IT Support, LPK Managerial Effectiveness increases by 0.701 units.

F. Hypothesis Testing (t -Test) & Significance:

Hypothesis testing (H_1) posits that Information Technology Support has a positive and significant effect on LPK Managerial Effectiveness.

- a. The statistical calculation yielded a t_{count} value of 9.696, which substantially exceeds the critical threshold $t_{table} = 1.982$ ($\alpha = 0.05, df = 107$).
- b. The associated two-tailed significance value is $p < 0.001$, well below the standard threshold of $\alpha = 0.05$.

Consequently, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted, empirically confirming that Information Technology Support exerts a statistically significant positive effect on the managerial performance of Job Training Institutes in Semarang Regency.

G. Coefficient of Determination (R^2)

As reported in Table 5, the model obtained a coefficient of determination (R^2) of 0.468 (Adjusted $R^2 = 0.463$). This signifies that 46.8% of the variance in LPK Managerial Effectiveness is explained by the degree of Information Technology Support provided within the institutes. The remaining 53.2% of variance is attributable to external organizational and environmental factors outside the current regression model.

H. Discussion

The findings of this study indicate that Information Technology (IT) support has a positive and statistically significant effect on the management practices of private vocational training institutions (*Lembaga Pelatihan Kerja* [LPKs]) in Semarang Regency. This relationship is evidenced by the results of the simple linear regression analysis, which produced a positive regression coefficient, and is further supported by a statistically significant t -test at the 95% confidence level. Furthermore, the coefficient of determination demonstrates that IT support accounts for a substantial proportion of the variation in LPK management performance, although additional factors beyond the research model also contribute to the effectiveness of organizational management.

These findings suggest that the higher the level of IT support available within an LPK, the more effective the execution of core management functions, including planning, organizing, implementation, and supervision. The availability of reliable technological infrastructure, integrated information systems, stable internet connectivity, and the digital competencies of managers and instructors facilitates faster administrative processes, more efficient interdepartmental coordination, systematic documentation of institutional activities, and more accurate monitoring and evaluation. Consequently, Information Technology serves not only as an operational support tool but also as a strategic resource for strengthening organizational governance and enhancing overall managerial effectiveness.

The results are consistent with the Technology-Organization-Environment (TOE) Framework, which posits that successful technology adoption is influenced by the readiness of technological, organizational, and environmental dimensions. In the present study, IT support represents the technological dimension that enhances organizational capacity to manage resources efficiently and effectively. When an organization possesses adequate digital infrastructure and human resources capable of utilizing technology effectively, decision-making processes become more responsive, coordination across organizational units improves, and the quality of training services delivered to participants is significantly enhanced. Therefore, these findings reinforce the explanatory power of the TOE Framework in understanding the role of Information Technology in improving organizational management effectiveness.

The findings are also consistent with previous studies demonstrating that digital transformation positively influences organizational effectiveness across various sectors.

Research conducted in vocational education has shown that Information Technology enhances administrative efficiency, accelerates information dissemination, improves service quality, and facilitates evidence-based decision-making. These studies collectively indicate that successful digital transformation depends not only on the availability of technological infrastructure but also on the organization's ability to integrate digital technologies into its operational processes and institutional governance.

Within the context of LPKs in Semarang Regency, IT support has become increasingly important in response to the growing demand for training services that are efficient, transparent, and well integrated with business and industrial sectors. The implementation of information systems enables more effective management of trainee records, training schedules, instructor assignments, institutional documentation, and reporting activities compared with conventional manual procedures. As a result, digital technology contributes to improving service quality while simultaneously strengthening organizational accountability and governance.

Despite these positive findings, the coefficient of determination indicates that a considerable proportion of the variation in management effectiveness remains explained by variables beyond IT support. These factors may include leadership style, organizational culture, human resource competencies, organizational readiness for change, government policy support, and the level of collaboration with business and industry. Accordingly, improving the quality of LPK management requires more than investments in technological infrastructure; it also necessitates strengthening human resource capabilities, fostering a digital organizational culture, and ensuring sustained leadership commitment to organizational transformation.

The primary contribution of this study lies in providing empirical evidence regarding the relationship between Information Technology support and management effectiveness in private vocational training institutions in Semarang Regency. Unlike most previous studies, which have primarily focused on the digitalization of learning processes or information systems within formal educational institutions, this research emphasizes organizational governance and management within vocational training centers. Consequently, the study extends the application of the Technology-Organization-Environment (TOE) Framework to the context of vocational training institutions while offering practical recommendations for LPK administrators and regional government authorities to formulate comprehensive digital transformation strategies that strengthen institutional governance and enhance workforce competitiveness.

The findings of this study are consistent with previous empirical research demonstrating that *Information Technology (IT)* support significantly enhances organizational management by improving administrative efficiency, communication quality, and institutional decision-making processes in educational organizations (Al-Emran et al., 2022). Digital transformation has also been shown to strengthen organizational governance through the integration of information systems that optimize operational coordination, service quality, and institutional performance across vocational education settings (Abdullah et al., 2023). Furthermore, the successful implementation of digital technologies depends on the organization's ability to integrate technological resources into managerial practices, thereby promoting sustainable organizational effectiveness and innovation (Verhoef et al., 2021).

The present findings are further supported by recent studies emphasizing that technological readiness, supported by competent human resources and organizational commitment, is a fundamental determinant of effective management and digital transformation success within educational institutions (Dwivedi et al., 2023). Likewise, empirical evidence indicates that digital capability enables organizations to improve strategic planning, monitoring systems, accountability, and evidence-based decision-making, all of which contribute to superior organizational performance (Sousa-Zomer et al., 2022). In addition, research conducted in vocational education confirms that comprehensive IT support strengthens institutional governance by facilitating integrated administrative services, improving

stakeholder collaboration, and enhancing workforce development outcomes, thereby reinforcing the findings obtained in this study (Nugroho et al., 2024).

CONCLUSION

This study demonstrates that Information Technology (IT) support has a positive and statistically significant effect on managerial effectiveness within Job Training Institutes (LPKs) in Semarang Regency. The findings support the Technology-Organization-Environment (TOE) Framework by confirming technological readiness as an important driver of organizational effectiveness and institutional governance. Overall, IT support and managerial effectiveness were evaluated at high levels, with technological infrastructure and digital human resource competence representing relatively strong dimensions, while internet connectivity remained comparatively weaker. IT integration contributed most strongly to planning, organizing, and executing functions, whereas monitoring, evaluation, and controlling required further improvement. These findings indicate that strengthening technological infrastructure, integrated information systems, connectivity, and digital competencies can enhance administrative efficiency, decision-making, and overall institutional governance.

Practically, LPK administrators should prioritize improving internet bandwidth and connectivity stability while adopting integrated Learning and Management Systems to strengthen real-time monitoring, evaluation, and reporting. At the regional policy level, the Semarang Regency Department of Manpower should promote an integrated digital ecosystem by connecting LPK information systems with public employment and training platforms and supporting continuous digital literacy development. Future research should expand the analytical model by incorporating organizational and environmental factors such as transformational leadership, digital organizational culture, internal readiness, and external regulatory support. Mixed-methods approaches combining quantitative surveys with qualitative interviews are also recommended to provide deeper insights into the challenges and success factors of digital transformation in vocational training institutions. Furthermore, studies involving multiple regencies or cross-provincial comparisons are needed to strengthen the generalizability of findings concerning digitalization in Indonesia's technical and vocational education and training sector.

Suggestions

Future research should expand the research scope to include Job Training Institutes across multiple regions. Larger samples and longer observation periods are recommended to improve the generalizability of the findings. Future studies should also incorporate additional organizational and environmental variables, such as leadership, digital culture, organizational readiness, and regulatory support. Alternative approaches, including Structural Equation Modeling, longitudinal analysis, and mixed-methods designs, may provide deeper insights into digital transformation and managerial effectiveness.

Author Contributions

All authors made significant contributions to the development of this study. Their contributions included conceptualization, theoretical framework development, data collection, data analysis, interpretation of findings, and manuscript preparation. All authors participated in the critical revision and scientific improvement of the manuscript. All authors reviewed and approved the final version of the manuscript for publication.

AI Disclosure Statement

The authors used ChatGPT to assist in developing initial research concepts and improving several parts of the manuscript. The tool was also used to support language refinement, paraphrasing, and improvement of selected academic narratives. All AI-assisted

content was reviewed, revised, and validated by the authors based on the research data and scholarly sources. The authors remain fully responsible for the accuracy, originality, interpretation, and final content of this manuscript.

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