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SAP-Based ERP Implementation and Accounting Information Quality at PT Perkebunan Nusantara IV

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Abstract

This research investigates SAP-based Enterprise Resource Planning implementation effects on accounting information quality at PT Perkebunan Nusantara IV Regional II Medan. Employing quantitative methodology with 35 employee respondents from accounting and finance divisions, the study examines ERP deployment impacts through questionnaire-based primary data collection. Multiple linear regression analysis reveals significant positive relationships between SAP-ERP implementation and information quality (t-value: 3.519, significance: 0.001). The determination coefficient ($R^2=0.449$) demonstrates that SAP-ERP explains 44.9% of accounting information quality variance, with remaining factors including user competence and internal controls. Findings confirm strategic technology adoption enhances financial reporting accuracy, timeliness, and relevance, supporting effective managerial decision-making processes in plantation enterprises.

Keywords: Accounting Information Quality, SAP System Implementation, Enterprise Resource Planning, Data Processing Technology

Introduction

Contemporary digital transformation fundamentally reshapes organizational financial management practices. Technological advancement enables sophisticated accounting systems that enhance data accuracy, processing efficiency, and decision-making capabilities (Alshahrani & Al-Maskari, 2023). Digital accounting platforms, including cloud-based solutions and integrated management systems, facilitate real-time financial monitoring and strategic resource allocation.

Human errors in financial reporting generate inaccurate information that compromises managerial effectiveness and organizational value (Okeleke & Adekunle, 2022). Technology-driven solutions, particularly Enterprise Resource Planning systems utilizing System Applications and Products (SAP) architecture, address these challenges through automated processes and integrated data management frameworks.

PT Perkebunan Nusantara IV Regional II Medan implemented SAP-ERP infrastructure in 2019, transitioning from legacy NERP systems. Implementation involved comprehensive employee training addressing language barriers, account code modifications, and system integration challenges. Initial adoption difficulties included network connectivity issues and concurrent user access limitations. However, comparative analysis demonstrates superior interface design, accelerated data entry processes, and enhanced workflow efficiency versus predecessor systems (Ningsih & Amelia, 2021). This investigation examines technology-driven information quality improvements within plantation enterprise contexts. Digitalization imperatives require organizations to enhance operational efficiency and data accuracy supporting strategic decision frameworks (Alnoor et al., 2022). SAP-ERP adoption

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integrates diverse business functions, generating accurate, relevant, and timely accounting information essential for competitive positioning.

Literature Review
System Theory
General System Theory conceptualizes systems as integrated entities maintaining existence through component interaction achieving specified objectives (Bertalanffy, 1968). Systems comprise interconnected elements operating synergistically toward common goals. Within organizational contexts, information systems facilitate coordinated activities, data processing, and decision support functions (Midgley, 2022).

Technology Acceptance Model (TAM)
Technology Acceptance Model, developed by Davis (1989), examines user adoption determinants through perceived usefulness and ease-of-use constructs. TAM posits that technology acceptance depends upon anticipated performance improvements and operational simplicity (Granić & Marangunić, 2019). Behavioral intentions toward technology utilization directly influence actual implementation success and organizational outcomes.

End-User Computing Satisfaction (EUCS)
End-User Computing Satisfaction theory, established by Doll and Torkzadeh (1988), measures application system satisfaction through expectation-reality comparisons. EUCS evaluation emphasizes content quality, accuracy, format appropriateness, timeliness, and operational ease dimensions (Tam & Oliveira, 2020). This framework assesses technological effectiveness from user perspectives, identifying improvement opportunities.

Enterprise Resource Planning
Enterprise Resource Planning represents integrated software architectures unifying organizational business processes and departmental information flows (Velcu, 2020). ERP systems facilitate cross-functional coordination through centralized databases, standardized procedures, and real-time information access. Successful implementation enhances operational efficiency, decision quality, and stakeholder value creation (Poba-Nzaou & Raymond, 2021).

System Applications and Products (SAP)
SAP constitutes comprehensive ERP software enabling efficient operational planning and execution through integrated application modules supporting transactional requirements (Hawking & Sellitto, 2022). SAP architecture provides real-time financial reporting capabilities, transparent transaction tracking, and comprehensive audit trail functionality. Organizations leverage SAP modules customized to specific operational needs, facilitating strategic alignment and performance optimization (Chofreh et al., 2020).

Accounting Information System Quality
Accounting Information Systems (AIS) systematically collect, document, and classify financial and operational data supporting strategic planning, decision-making, resource management, and regulatory compliance (Aziz & Naima, 2021). Quality AIS characteristics include accuracy, timeliness,

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completeness, relevance, and reliability dimensions essential for stakeholder confidence and organizational transparency (Grande et al., 2021).

Primary AIS objectives encompass (Meiryani et al., 2020):
- Collecting and storing financial activity data
- Processing data into decision-relevant information
- Controlling organizational operational aspects

Methods
Research Design
This quantitative investigation employs survey methodology examining SAP-ERP implementation effects on accounting information quality. Research conducted at PT Perkebunan Nusantara IV Regional II Medan utilizes questionnaire instruments measuring variable relationships through structured respondent assessments (Creswell & Creswell, 2018).

Population and Sample
Target population comprises accounting and finance division employees directly utilizing SAP-ERP systems. Total sampling methodology incorporates all 35 eligible respondents, ensuring comprehensive organizational representation and statistical validity.

Variables and Measurement
Independent Variable: Enterprise Resource Planning based on System Applications in Data Processing (SAP-ERP)
Dependent Variable: Accounting Information Quality measured through accuracy, timeliness, completeness, and relevance dimensions

Data Analysis Techniques
Analytical procedures include:
- Classical Assumption Testing: Normality, multicollinearity, and heteroscedasticity assessments ensuring regression validity
- Multiple Linear Regression Analysis: Quantifying independent variable effects on dependent variable
- Hypothesis Testing: t-test evaluating individual variable significance; F-test examining simultaneous effects
- Coefficient of Determination (R^2): Measuring explanatory power of regression model

Results and Discussion
Classical Assumption Tests

Normality Test

Table 1. Kolmogorov-Smirnov Normality Test Results

Test Statistic	Value
Asymp. Sig. (2-tailed)	0.200

Source: SPSS 26 analysis, 2025

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Kolmogorov-Smirnov results demonstrate residual normality (significance: 0.200 > 0.05), satisfying regression assumptions. Histogram and P-P Plot visualizations confirm normal distribution patterns, validating statistical inference procedures (Field, 2024).

Figure 1. Normality Histogram The histogram displays symmetric distribution around central tendency, indicating unbiased residuals and appropriate model specification.
Figure 2. Normal P-P Plot Data points align closely with diagonal reference line, confirming normal probability distribution of standardized residuals.

Multicollinearity Test

Table 2. Multicollinearity Diagnostic Results

Variable	Tolerance	VIF
SAP-ERP	1.000	1.000

Source: SPSS 26 analysis, 2025

Tolerance values exceeding 0.10 and VIF statistics below 10 confirm absence of multicollinearity, ensuring reliable coefficient estimation (Hair et al., 2021).

Heteroscedasticity Test
Figure 3. Scatterplot Pattern Analysis
Scatterplot examination reveals random residual distribution without systematic patterns, indicating homoscedastic variance structure. Points disperse evenly across Y-axis zero line, validating constant variance assumption (Tabachnick & Fidell, 2023).

Multiple Linear Regression Analysis

Table 3. Regression Coefficient Estimates

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
	B	Std. Error	Beta	
(Constant)	10.441	3.215		3.247
SAP-ERP	0.288	0.082	0.670	3.519

Source: SPSS 26 analysis, 2025

Regression Equation: Accounting Information Quality = 10.441 + 0.288(SAP-ERP)

Interpretation:
- Constant (10.441): Baseline accounting information quality absent SAP-ERP implementation
- SAP-ERP Coefficient (0.288): One-unit increase in SAP-ERP implementation enhances accounting information quality by 0.288 units, holding other factors constant

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Hypothesis Testing
Partial Significance Test (t-test)

Table 4. Individual Variable Significance

Variable	Coefficient	t-statistic	Significance	t-table	Decision
SAP-ERP	0.288	3.519	0.001	2.036	H_1 Accepted

Source: SPSS 26 analysis, 2025

Statistical evidence (t-calculated: 3.519 > t-table: 2.036; significance: 0.001 < 0.05) confirms significant positive SAP-ERP effects on accounting information quality. Results support Hypothesis 1, demonstrating technology-driven quality improvements.

Coefficient of Determination (R^2)

Table 5. Model Summary Statistics

Model	R	R Square	Adjusted R Square	Std. Error
1	0.670	0.449	0.432	2.841

Source: SPSS 26 analysis, 2025

Adjusted R^2 value (0.449) indicates SAP-ERP implementation explains 44.9% of accounting information quality variance. Remaining 55.1% attributes to external factors including user competence, internal controls, organizational culture, and management support (Appelbaum et al., 2020). Correlation coefficient (R=0.670) demonstrates strong positive relationship between variables.

Discussion

SAP-ERP Implementation Effects on Accounting Information Quality
Empirical findings confirm significant positive relationships between SAP-ERP adoption and accounting information quality enhancement. Technology Acceptance Model principles validate that perceived usefulness and operational ease drive system acceptance and quality outcomes (Granić & Marangunić, 2019). SAP architecture provides real-time processing, integrated workflows, and comprehensive audit capabilities superior to legacy systems.

Quality improvements manifest through enhanced accuracy, timeliness, completeness, and relevance dimensions. Automated processes reduce human error incidence, while standardized procedures ensure consistency across operational units (Aziz & Naima, 2021). Real-time data availability supports responsive decision-making and strategic agility essential for competitive positioning.
Results align with previous investigations demonstrating ERP-driven information quality enhancements in plantation enterprises and manufacturing sectors (Ningrum & Wedari, 2020; Chofreh et al., 2020). However, implementation challenges including language barriers, network constraints,

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and user adaptation requirements necessitate comprehensive training and technical support frameworks.

Organizational factors beyond technology infrastructure influence information quality outcomes. User competence, management commitment, organizational culture, and change management effectiveness constitute critical success determinants requiring integrated attention (Poba-Nzaou & Raymond, 2021). Future investigations should examine these contextual factors enhancing theoretical understanding and practical guidance.

Conclusion

SAP-based Enterprise Resource Planning implementation demonstrates significant positive effects on accounting information quality at PT Perkebunan Nusantara IV Regional II Medan. Statistical analysis confirms that SAP-ERP adoption explains 44.9% of information quality variance, with technology-driven improvements enhancing accuracy, timeliness, and decision support capabilities. Findings validate strategic technology investments as essential for competitive financial management in contemporary business environments.

Research limitations include single-organization focus and 44.9% explanatory power, indicating additional factors influencing information quality outcomes. Future research should expand sample sizes across multiple organizations, incorporate longitudinal designs capturing implementation evolution, and examine complementary factors including user competence, internal controls, organizational culture, and management support systems.

Managerial Implications:

- Prioritize comprehensive training programs addressing language barriers and system proficiency
- Develop robust technical infrastructure ensuring network reliability and concurrent user support
- Implement change management frameworks facilitating user acceptance and organizational adaptation
- Establish continuous improvement mechanisms addressing emerging challenges and optimization opportunities

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