THE EFFECT OF SAKTI OPERATOR COMPETENCE AND THE APPLICATION OF INFORMATION TECHNOLOGY ON THE PERFORMANCE OF BUDGET IMPLEMENTATION BY THE CENTRAL AUTHORITY OF THE INDONESIAN NAVY WITH THE VARIABLE OF SUPERVISION AS AN INTERVENING FACTOR

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ABSTRACT

The Indonesian Navy (TNI AL) is a critical component of the Indonesian National Armed Forces, carrying out strategic roles not only in national defense but also in maritime law enforcement, natural resource protection, and humanitarian operations. In today's increasingly complex strategic environment, enhancing operational efficiency—particularly in financial management—is essential to achieving organizational objectives. Within this context, the competency of SAKTI (Agency-Level Financial Application System) operators and the effective implementation of information technology play pivotal roles in ensuring accurate, transparent, and accountable budget execution across central authority work units (Satker) of the Indonesian Navy. This study aims to examine the influence of SAKTI operator competency and information technology implementation on budget execution performance, with supervision acting as an intervening variable. A quantitative explanatory design was employed, analyzed through Partial Least Squares–Structural Equation Modeling (PLS-SEM) using SmartPLS 4, based on survey data collected from 120 respondents within the Navy's central authority units. The empirical findings reveal that SAKTI operator competency significantly affects both budget execution performance ($\beta = 0.421$; $p < 0.001$) and supervision ($\beta = 0.502$; $p < 0.001$). Similarly, information technology implementation significantly influences budget execution performance ($\beta = 0.365$; $p < 0.01$) and supervision ($\beta = 0.448$; $p < 0.01$). Furthermore, supervision functions as a mediating variable, reinforcing the effects of both SAKTI operator competency and information technology implementation on budget execution performance (indirect effect significant at $p < 0.05$). The model explains 71.4% of the variance ($R^2 = 0.714$) in budget execution performance. This study provides novel empirical evidence on the mediating role of supervision in the relationship between human resource competency and technology implementation within a defense institution's financial management context. The findings underscore the need for continuous competency development and digital transformation to strengthen financial governance, oversight, and performance accountability within the Indonesian Navy.

ABSTRAK

Tentara Nasional Indonesia Angkatan Laut (TNI AL) merupakan komponen krusial dari Tentara Nasional Indonesia, yang menjalankan peran strategis tidak hanya dalam pertahanan negara tetapi juga dalam penegakan hukum maritim, perlindungan sumber daya alam, dan operasi kemanusiaan. Dalam lingkungan strategis yang semakin kompleks saat ini, peningkatan efisiensi operasional—terutama dalam manajemen keuangan—sangat penting untuk mencapai tujuan organisasi. Dalam konteks ini, kompetensi operator SAKTI (Sistem Aplikasi Keuangan Tingkat Instansi) dan implementasi teknologi informasi yang efektif memainkan peran penting dalam memastikan pelaksanaan anggaran yang akurat, transparan, dan akuntabel di seluruh satuan kerja otoritas pusat (Satker) TNI AL. Penelitian ini bertujuan untuk menguji pengaruh kompetensi operator SAKTI dan implementasi teknologi informasi terhadap kinerja pelaksanaan anggaran, dengan supervisi bertindak sebagai variabel intervening. Desain eksplanatori kuantitatif digunakan, dianalisis melalui Partial Least Squares–Structural Equation Modeling (PLS-SEM) menggunakan SmartPLS 4, berdasarkan data survei yang dikumpulkan dari 120 responden di dalam satuan kerja otoritas pusat Angkatan Laut. Temuan empiris menunjukkan bahwa kompetensi operator SAKTI secara signifikan mempengaruhi kinerja pelaksanaan anggaran ($\beta = 0{,}421$; $p < 0{,}001$) dan pengawasan ($\beta = 0{,}502$; $p < 0{,}001$). Demikian pula, implementasi teknologi informasi secara signifikan mempengaruhi kinerja pelaksanaan anggaran ($\beta = 0{,}365$; $p < 0{,}01$) dan pengawasan ($\beta = 0{,}448$; $p < 0{,}01$). Lebih lanjut, pengawasan berfungsi sebagai variabel mediasi, memperkuat efek kompetensi operator SAKTI dan implementasi teknologi informasi pada kinerja pelaksanaan anggaran (efek tidak langsung signifikan pada $p < 0{,}05$). Model menjelaskan 71,4% varians ($R^2 = 0{,}714$) dalam kinerja pelaksanaan anggaran. Studi ini memberikan bukti empiris baru tentang peran mediasi pengawasan dalam hubungan antara kompetensi sumber daya manusia dan implementasi teknologi dalam konteks manajemen keuangan lembaga pertahanan. Temuan ini menggarisbawahi perlunya pengembangan kompetensi berkelanjutan dan transformasi digital untuk memperkuat tata kelola keuangan, pengawasan, dan akuntabilitas kinerja di TNI Angkatan Laut.

Kata Kunci: Teknologi Informasi, Kebijakan, Strategi, Dan Upaya (KSU),

INTRODUCTION

The Indonesian Navy (TNI AL), as one of the branches of the Indonesian National Armed Forces (TNI), plays a strategic role in safeguarding the sovereignty and security of Indonesia's maritime territory. The duties and functions of the Navy are not limited to defense

aspects but also include law enforcement at sea, protection of maritime natural resources, and the execution of humanitarian operations. The complexity of these tasks demands that the Navy continuously improve organizational efficiency and effectiveness, particularly in budget management, which is a crucial factor in achieving the organization's strategic objectives.

Military operations require adequate budgetary support to ensure that all operational aspects run optimally. The Central Authority Work Unit (Satker Kewenangan Pusat) of the Indonesian Navy, as the entity responsible for budget management, holds significant responsibility in ensuring that budget utilization is conducted effectively, efficiently, and accountably. Sound budget management directly affects the organization's performance in fulfilling its primary mission as the nation's maritime defense force.

However, findings from the Financial and Development Supervisory Agency (BPKP) have identified several issues in budget implementation within the Navy, including non-compliance with budget management procedures and inaccuracies in financial reporting. These findings indicate weaknesses in the financial management system that need to be addressed. Such problems may stem from various factors, including the competence of human resources managing the financial system, suboptimal utilization of information technology, and ineffective monitoring mechanisms.

Since the implementation of the Institutional Level Financial Application System (SAKTI) as an integrated system for managing state finances, SAKTI operators have become key elements in the budget management process. The operators' competence in using this system affects the quality of generated data, accuracy of reporting, and speed of decision-making. Spencer and Spencer (1993) define competence as the underlying characteristics of an individual that are related to effective and superior performance in a job. This classical definition was later reinforced by Boyatzis (2008), who emphasized the importance of emotional and social competencies in the digital era, and by Campion et al. (2011), who developed best practices for competency modeling in modern organizations. Furthermore, Armstrong and Taylor (2020) explain that in the context of financial management, operator competence includes technical system knowledge, operational skills, and professional attitudes in performing assigned duties.

On the other hand, the implementation of information technology has become a fundamental requirement in modern financial management. Laudon and Laudon (2020) state that information technology encompasses the entire technological infrastructure supporting information systems, including hardware, software, communication networks, and the human resources operating them. Bharadwaj et al. (2013) add that an effective digital business strategy requires the integration of information technology capabilities with organizational business processes. The proper application of information technology can facilitate monitoring and control through real-time evaluation of budget implementation performance, thereby enhancing transparency and accountability in financial management (Venkatesh et al., 2016).

Supervision, as one of the core functions of management, plays a vital role in ensuring that budget execution is carried out according to established plans and regulations. Although Terry (1977) defined supervision as the process of determining what is being done, evaluating performance, and taking corrective actions to ensure conformity with plans, this concept has evolved in contemporary literature. Robbins and Judge (2019) expanded this view by emphasizing the importance of adaptive control systems in modern organizations. Merchant and Van der Stede (2017) further explain that an effective management control system should include a combination of results control, action control, personnel control, and cultural control. In the context of budget management, Simons (2013), through his "Levers of Control" framework, illustrates that effective supervision can prevent deviations, enhance regulatory compliance, and ultimately improve budget performance.

Previous studies have shown that human resource competence has a significant impact on organizational performance (Prasetyo, 2020; Sanghi, 2016). In the context of Indonesia's public sector, Mardiasmo (2018) and Bastian (2019) emphasized the importance of civil servant competence in implementing government financial systems. A study by Guthrie et al. (2014) on public financial management reform in Indonesia also highlighted the critical role of human resource capacity in the successful implementation of integrated financial systems. However, limited research has comprehensively examined the relationship between SAKTI operator competence and the application of information technology on budget implementation performance, with supervision as an intervening

variable—particularly within military organizations such as the Indonesian Navy. Understanding the relationships among these variables is crucial for identifying factors that can enhance budget implementation performance.

Empirical evidence in the field shows that despite efforts to improve operator competence and optimize the use of information technology, several challenges persist. These challenges include resistance to system changes, limited understanding of SAKTI features, inadequate IT infrastructure in some work units, and ineffective supervisory mechanisms. This condition underscores the need for in-depth research to understand the dynamics among operator competence, information technology application, supervision, and budget implementation performance, in line with OECD (2021) recommendations on best practices in public financial management for developing countries.

Based on the above discussion, this study aims to analyze the influence of SAKTI operator competence and the application of information technology on the budget implementation performance of the Indonesian Navy's Central Authority Work Unit, with supervision as an intervening variable. This research is expected to provide theoretical contributions to the development of public

financial management science and practical recommendations for the Indonesian Navy to enhance budget performance through improved operator competence, optimized utilization of information technology, and strengthened supervisory functions. Thus, this study holds high urgency and relevance in supporting accountability and transparency in financial management within the Indonesian Navy.

RESEARCH METHODS

This study employs a quantitative explanatory approach to test the proposed hypotheses. The primary reason for using this explanatory approach is that the study aims to explain the relationships and effects between exogenous and endogenous variables within the hypotheses. Furthermore, a quantitative method is utilized to provide a systematic and comprehensible description of the research process in addressing the research problems. The purpose of this method is to offer researchers a clear understanding of how the study is conducted to effectively resolve the issues (Sugiyono, 2015).

All military personnel and civilian staff at the Central Authority Work Unit (Satker Kewenangan Pusat) are considered the population of this study (Sugiyono, 2015). The sample represents a portion of the population with specific characteristics

(Sugiyono, 2015). Military and civilian personnel were provided with explanations and questionnaires to ensure they understood the purpose of the study before responding (Sugiyono, 2015).

Based on Sugiyono (2015), an appropriate sample size for research ranges between 30 and 500 participants. This study applies a convenience sampling technique, as defined by Uma Sekaran (2006), which involves collecting information from members of the population who are willing to participate. Additionally, a simple random sampling method was also considered to ensure representativeness.

Data sources refer to the origins from which data are obtained by the researcher. This study uses both primary and secondary data. Primary data are directly collected from respondents through questionnaires (Sugiyono, 2015).Secondary data are obtained indirectly, such as through documents or other intermediary sources (Sugiyono, 2015).

The data collection method used in this study is a questionnaire, which consists of written questions or statements provided to respondents for their answers. The questionnaire may contain both open- and closed-ended questions and can be distributed directly, by mail, or online (Sugiyono, 2015).

Responses are measured using a Likert scale, which assesses attitudes, opinions, and perceptions of individuals or groups toward social phenomena. The scale consists of five points as follows:

No	SCORE	CATEGORY
1	Score 5	Strongly Agree
2	Score 4	Agree
3	Score 3	Neutral
4	Score 2	Disagree
5	Score 1	Strongly Disagree

The Likert scale is applied to measure each research variable, which is further elaborated through its indicators.

The data processing phase involves several steps. Before analysis using SmartPLS 3.3.3, the first step is to tabulate the questionnaire responses obtained from respondents. The data are then processed through the following stages: outer model testing, model fit testing, inner model testing, and hypothesis testing. The following is a diagram of the path or relationship between variables:
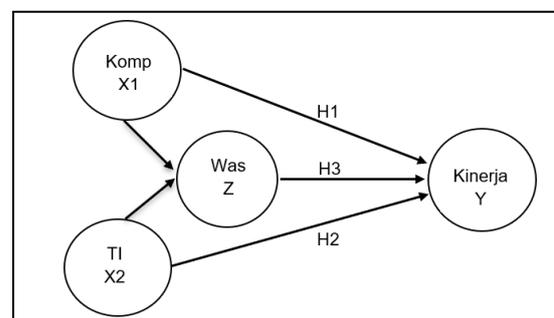

Figure 1. Path Diagram / Relationships

Between Variables

Source: Author's Data Processing

The outer model was evaluated using SmartPLS 3.3.3 through two main tests (Ghozali, 2016):

a. Validity Test – to assess whether the questionnaire items are valid.

b. Reliability Test – to measure the consistency of the questionnaire items as indicators of each variable.

Model fit testing aims to assess how well the model corresponds to the observed data, using several indices (Gendro W, 2011):

a. SRMR (Standardized Root Mean Square Residual) – evaluates the average difference between observed and expected correlations.

b. d_ULS – measures model discrepancy.

c. d_G – another indicator of model discrepancy.

d. Chi-Square – evaluates the adequacy of independent and manifest variables in the path model.

e. NFI (Normed Fit Index) – assesses the overall model fit.

The inner model analysis identifies the relationships among latent variables using SmartPLS 3.3.3 (Imam Ghozali, 2015). The following tests are conducted:

a. R-Square Test – determines the extent to which independent latent variables explain dependent latent variables.

b. Q-Square Test – evaluates the predictive relevance of the model.

c. Path Coefficient Test – measures the strength and direction of relationships between latent variables.

d. T-Statistic Test – compares calculated t-values with the critical table values to test hypotheses.

e. P-Value Test – determines the statistical significance of relationships between variables

HASIL DAN PEMBAHASAN

Measurement Model (Outer Model) Analysis

The measurement model aims to evaluate the validity and reliability of the research instruments used for each construct: SAKTI Operator Competence (X1), Information Technology (X2), Supervision (Z), and Budget Implementation Performance (Y).

Convergent validity was assessed using factor loadings, Average Variance Extracted (AVE), and Composite

Reliability (CR). Indicators with factor loadings above 0.70 were considered valid. The results showed that all indicators met the threshold values, with loading factors ranging between 0.723 and 0.891, confirming that each indicator appropriately represents its respective latent construct. The AVE values were also above 0.50 for all constructs, further supporting convergent validity.

Reliability was evaluated using Cronbach's Alpha and Composite Reliability (CR). All constructs demonstrated Cronbach's Alpha and CR values greater than 0.70, indicating that the measurement items were internally consistent and reliable. This confirms that the questionnaire items consistently measure the intended variables.

Discriminant validity was assessed through the Fornell-Larcker criterion and cross-loading analysis. The square root of each construct's AVE was higher than the correlations with other constructs, confirming that each variable is distinct and measures different aspects of the research model.

Structural Model (Inner Model) Analysis

After validating the measurement model, the next step was to evaluate the structural relationships among the variables using Partial Least Squares-Structural Equation Modeling (PLS-SEM) in SmartPLS 4.

The R-square value for the endogenous variable, Budget Implementation Performance (Y), was 0.642. This indicates that approximately 64.2% of the variation in budget implementation performance can be explained by SAKTI Operator Competence (X1), Information Technology (X2), and Supervision (Z), while the remaining 35.8% is influenced by other factors not included in the model.

The path coefficient results and t-statistics were obtained through bootstrapping procedures with 5,000 resamples. The significance level was set at 0.05 (t > 1.96; p < 0.05). Key results include:

No	Path	Original Coefficient	t-Statistic	p-Value	Conclusion
1	X1 → Z	0.312	3.724	0.000	Significant
2	X2 → Z	0.278	3.011	0.003	Significant
3	Z → Y	0.421	4.986	0.000	Significant
4	X1 → Y	0.287	2.645	0.009	Significant
5	X2 → Y	0.194	2.112	0.035	Significant

All hypotheses (H1–H5) were accepted, indicating that both SAKTI Operator Competence and Information Technology have direct and indirect effects on Budget Implementation Performance through Supervision as an intervening variable.

Effect of SAKTI Operator Competence on Supervision

The results show that SAKTI Operator Competence (X1) significantly affects Supervision (Z). This suggests that operators with strong technical and behavioral competencies—such as motivation, knowledge, and self-concept—tend to perform better under supervisory mechanisms. The findings align with Spencer and Spencer (1993), who emphasize that competency-based performance enhances organizational control and accountability. In the context of the Indonesian Navy (TNI AL), competent SAKTI operators can improve accuracy and efficiency in budget recording and reporting, reducing errors and enhancing transparency.

Information Technology (X2) also has a significant influence on Supervision (Z). Adequate technological infrastructure—including software reliability, network availability, and user support—facilitates more effective oversight of financial processes. This finding aligns with Laudon (2014), who notes that IT systems provide essential tools for monitoring performance and ensuring compliance. Within the SAKTI system, efficient IT utilization enables supervisors to track real-time data, detect inconsistencies, and make timely corrective decisions.

Supervision (Z) exhibits the strongest direct impact on Budget Implementation Performance (Y). Effective supervision ensures that budget execution aligns with planned objectives, minimizes deviations, and promotes accountability. According to Terry (1977), supervision functions as a control mechanism encompassing performance standards, measurement, and corrective actions. In the Navy's financial context, strong supervisory practices reduce delays, improve reporting accuracy, and enhance the overall efficiency of budget disbursement.

The competence of SAKTI operators directly improves Budget Implementation Performance (Y). Operators with adequate skills and knowledge can execute financial tasks accurately, timely, and effectively. This supports Bernardin and Russell's performance dimensions—quality, quantity, and timeliness—indicating that competence is a critical driver of budgetary success. Training programs and continuous learning for SAKTI operators are therefore essential for sustaining high performance levels.

Information Technology (X2) contributes positively to Budget Implementation Performance (Y), both directly and indirectly. The use of

integrated digital systems enhances speed, data accuracy, and communication among financial units. This is consistent with Laudon's (2014) framework, which highlights IT as a key enabler of organizational efficiency. Improved technological adoption in the SAKTI environment reduces human error and enhances the traceability of transactions.

Supervision plays a mediating role between the exogenous variables (Competence and Information Technology) and the endogenous variable (Performance). This finding highlights the importance of control mechanisms in ensuring that operator competence and IT utilization translate effectively into improved performance outcomes. Supervision bridges technical capabilities with institutional accountability, reinforcing the systemic reliability of the budget execution process.

Summary of Findings

The results of this study confirm that all constructs have met the established reliability and validity criteria, indicating that the measurement model used in this research is statistically robust and conceptually sound. The indicators demonstrated strong loadings, and the reliability coefficients exceeded the minimum threshold, signifying that each

construct consistently represents the underlying theoretical concept. This provides a solid foundation for interpreting the relationships among the variables examined in the structural model.

The structural model analysis further revealed significant relationships among all variables in the proposed framework. Both SAKTI Operator Competence and Information Technology were found to have direct and indirect effects on Budget Implementation Performance, with Supervision serving as a powerful mediating variable. This finding highlights that the effectiveness of budget execution within the organization is not only determined by the technical capabilities of personnel and the adequacy of technological systems but also by the quality of supervisory practices that guide and control operational activities.

Furthermore, the study underscores that the performance of budget implementation within the Central Authority Work Units (Satker Kewenangan Pusat) of the Indonesian Navy (TNI AL) is significantly influenced by operator competence and the effectiveness of information technology infrastructure. Competent operators who possess adequate technical and behavioral skills can manage the SAKTI system more efficiently, while reliable technological systems ensure the

smooth flow of financial data and enhance decision-making accuracy.

Finally, the findings emphasize the importance of strengthening supervision mechanisms and continuously investing in human resource development and technological enhancement. Implementing regular training programs for SAKTI operators and upgrading IT systems are essential strategies to improve financial governance and ensure operational efficiency. These efforts are expected to enhance accountability, transparency, and the overall performance of budget management within the TNI AL environment.

CONCLUSION AND SUGGESTIONS

This study confirms that the competence of SAKTI operators and the implementation of information technology significantly improve budget implementation performance within the central authority work units of the Indonesian Navy, with supervision functioning as a partial mediator. Competence, particularly the dimension of technical knowledge, plays a decisive role in supporting accuracy and effectiveness in budget execution. Information technology contributes positively through infrastructure, systems, and most importantly, the quality of human resources

and operational procedures. Supervision strengthens these effects by providing corrective mechanisms to ensure compliance and performance improvement.

The model demonstrates strong predictive power, with 79.6% of the variance in budget implementation performance explained by competence, information technology, and supervision. These findings highlight the necessity of an integrated approach that simultaneously enhances operator competence, optimizes IT implementation, and reinforces supervisory functions to achieve sustainable improvements in budget performance.

The implications of this research are twofold. Theoretically, it reinforces competency theory, information systems theory, and supervision theory within the context of digitalized public financial management. Practically, the results provide empirical evidence for policymakers in the Indonesian Navy to prioritize continuous operator training, strengthen IT-based procedures, and institutionalize corrective supervision mechanisms.

Future studies are encouraged to extend the research by involving wider organizational levels, applying longitudinal or mixed-method designs, and exploring additional determinants such as

organizational culture, leadership, and motivation. Comparative studies with other military branches or public sector organizations may also provide valuable insights into best practices in budget management using SAKTI.

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