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OPTIMIZING ASSET AND MATERIEL MANAGEMENT IN THE AIR FORCE MATERIEL SERVICE AS A STRATEGY TO INCREASE BUDGET EFFICIENCY

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ABSTRACT

This study aims to analyze the optimization of asset and material management at the Air Force Materiel Service (Dinas Materiel TNI AU) as a strategy to enhance budget efficiency in the context of economic development. In the framework of sustainable economic development, the management of resources, particularly military materials and assets, plays a crucial role in improving operational effectiveness and minimizing budget waste. This research employs a quantitative approach using survey techniques and statistical data analysis to identify and measure the level of efficiency in asset and material management within the Air Force Materiel Service. The findings indicate that despite ongoing improvement efforts, challenges remain in technology implementation, inter-departmental coordination, and system updates, all of which contribute to operational inefficiency. Therefore, this study recommends optimization strategies based on digital technology and enhanced monitoring systems to support efficient asset and material management in the public sector, particularly within the Indonesian Air Force.

Keywords: Asset management, budget efficiency, Indonesian Air Force

Introduction

The economic development of a country is greatly influenced by the effectiveness of public asset management, including in strategic sectors such as defense. In this context, the Air Force Materiel Service (TNI AU) has a vital role as a logistics guard that supports the operational readiness of each air unit. Assets and materials managed are not only movable goods, such as vehicles and military equipment, but also immovable assets such as maintenance facilities and storage warehouses. Efficiency and accountability in asset management are crucial aspects to ensure that the defense budget is used optimally, transparently, and sustainably.

However, practice in the field shows that asset management within the Indonesian Air Force Materiel Service still faces various challenges. Starting from the limitations of integrated information systems, the lack of a state-of-the-art asset database, to the lack of personnel training in modern logistics management. This condition causes budget inefficiencies such as double procurement, assets that are not utilized optimally, and obstacles in reporting and internal audits.

Several previous studies have underlined that the use of information technology and the application of good asset management principles can improve the efficiency and effectiveness of public institutions (Mardiasmo, 2018; Mahmudi, 2019). Digitized asset management enables traceability, transparency, and speed in data-driven decision-making. This is in line with the spirit of bureaucratic reform and modernization of the defense sector. Based on this background, this research aims to:

1. Identify factors that affect the optimization of asset management in the Air Force Materiel Service (TNI AU).
2. Analyze how asset management and utilization of logistics information systems contribute to operational efficiency and budget efficiency.
3. Prepare data-based strategic recommendations and survey results that can be used as input for internal policy of defense institutions.

By integrating a quantitative approach through surveys and regression analysis, this research is expected to be able to provide an empirical picture of the actual state of asset management in the Indonesian Air Force and offer implementable solutions that are in accordance with existing challenges and potentials.

Method

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In this study, the approach used is quantitative, which is an approach that uses data in the form of numbers and is processed using statistical techniques. This approach was chosen because it is in accordance with the purpose of the research, which is to find out whether asset management and the use of information systems have a real and significant influence on budget efficiency within the Air Force Materiel Service (TNI AU).

In other words, this study not only wants to describe the existing conditions, but also to explain the relationship between several important factors that are the focus of the research.

1. Types of Research

This type of research is included in the category of explanatory research (explanatory research), which is research that aims to find cause-and-effect relationships between the variables being studied. In this context, the independent variables are:

a. Asset Management, and
b. Information Systems,

While the bound variables are:

a. Budget Efficiency.

By using this type of research, researchers hope to answer whether the better the management of assets and information systems, the higher the budget efficiency in the TNI AU's work unit.

2. Population and Sample

The population in this study is all TNI AU personel who work in the Materiel Service, both at the center and the units under it. This population was chosen because they are the party who best understands the logistics management process, starting from procurement, distribution, utilization, to asset maintenance. Because not all personnel can be used as respondents, a part of the population was taken as a research sample. The sample used was 50 people, which were selected using the purposive sampling technique. This technique means that the selection of samples is carried out based on certain criteria, namely:

a. The personnel have worked in the field of logistics or assets for at least 2 years,
b. Have direct experience in asset management or the use of information systems,
c. Willing to provide information honestly and openly.

With this technique, researchers ensure that only people who truly understand and are directly involved in the process of asset management and information systems are involved in the research.

3. Data Collection Techniques

The data in this study was collected using questionnaires that were systematically compiled based on the indicators of each variable. This questionnaire contains closed-ended statements, in which respondents are asked to give a level of approval to each statement using a Likert scale from 1 to 5.

4. Research Instrument Feasibility Test

Before the questionnaire was distributed to the main respondents, the researcher first conducted a pre-test on a limited number of respondents who had similar characteristics to the study population. The purpose of this test is to ensure that the instrument used meets the feasibility requirements statistically, namely in terms of validity and reliability. The validity test was carried out to find out whether each statement in the questionnaire really measured the variables in question, namely asset management, information systems, and budget efficiency. The test results showed that all items in the questionnaire had a strong enough relationship with their respective variables, so they were declared valid and suitable for use. Meanwhile, reliability tests are conducted to ensure that the questionnaire can provide consistent results if used at different times or respondents but have similar conditions. Based on the test results, all statements in the questionnaire were declared reliable, as they showed a high level of consistency between items. Thus, it can be concluded that this research instrument has met the requirements for validity and reliability, so it is suitable for data collection in this study.

5. Data Analysis Techniques

After all the data is collected, the next step is to process and analyze the data so that conclusions can be drawn. The analysis techniques used in this study are:

a. Descriptive Statistics, which is to describe the profile of respondents and the tendency of their answers to each statement.
b. Multiple Linear Regression, which is to find out whether there is an influence between asset management variables (X_1) and information systems (X_2) on budget efficiency (Y). The basic formula of regression analysis is:

Y = a + b1X1 + b2X2 + e
Information:
Y = Budget efficiency (affected variable)
X1 = Asset management
X2 = Information system
a = Constant value
b1 and b2 = The coefficient of influence of each variable
e = Error or other error outside the model

Result and Discussion

This research was conducted to determine the extent of the influence of asset management and the use of information systems on budget efficiency in the Air Force Materiel Service (TNI AU). Data was obtained from 50 respondents spread across various sections, such as planning, procurement, warehouse, distribution, and information systems. The data were analyzed using multiple linear regression, and the results showed that the two independent variables had a significant effect on the work efficiency of the TNI AU logistics unit.

1. Respondent Overview

The majority of respondents have a tenure of more than 5 years (68%), indicating that they are quite experienced in carrying out logistics and asset management tasks. Most respondents are also used to using internal information systems even though not all features can be used to the fullest. This shows that there is a readiness of the organization to accept changes towards the digitalization of the logistics system, but it still requires increasing the capacity of human resources.

2. The Influence of Asset Management on Budget Efficiency

Good asset management includes accurate data collection, periodic monitoring, and a systematic deletion and maintenance system. From the results of the questionnaire, more than 80% of respondents stated that regular asset recording has helped them in arranging logistics needs more efficiently and on target. This efficiency arises because valid asset data helps minimize duplication of procurement, reduce damage to goods due to overstock, and accelerate decision-making in the procurement or distribution of goods. With orderly management, unit leaders no longer need to manually check the warehouse or distribution department. All information is available through periodic reports. This supports time efficiency, labor efficiency, and budget use efficiency. As stated by Mardiasmo (2018), transparent and accountable management of public assets is the main key to efficient use of the state budget. This research proves that this principle also applies in the military environment, especially the Indonesian Air Force.

3. The Influence of Information Systems on Budget Efficiency

Other results show that the logistics information system implemented in several units of the Materiel Office has provided real benefits. The system includes:

a. Barcode/QR code-based asset labeling,
b. Use of the stock dashboard,
c. Automated reporting based on internal logistics software,
d. Real-time recording of goods in and out.

Respondents stated that this system not only makes the work easier, but also makes the supervision process more open. Supervisors can immediately check daily or monthly reports without having to wait for the recapitulation manual. This speeds up decision-making and minimizes the possibility of logistical irregularities. In comparison, before this system was implemented, most reporting was still done manually using Microsoft Excel or paper notes. This often leads to data errors, report delays, and even loss of important information. With more modern systems, all processes become faster, more accurate, and well-documented. This finding is strengthened by Mahmudi (2019) who emphasizes the importance of the use of information technology in supporting the effectiveness of public services. Likewise, Nasution (2020) stated that an integrated information system in military logistics will increase responsiveness and accountability.

4. Multiple Linear Regression Test Results

Table 1 Summary of Multiple Linear Regression Test Result

Variabel	Coeficin Beta	Nilai Sig. (p-value)
Asset Management (X1)	0,456	0,003
Information Systems (X2)	0,529	0,001
R-squared (R^2)	0,682	

Remarks: Significant at 95% confidence level ($p < 0.05$)

The results of the analysis show that both variables, both asset management and information systems, have a significant effect on budget efficiency. An R^2 value of 0.682 means that about 68.2% of the variation in budget efficiency can be explained by both variables. This means that if asset management and information systems are improved, budget efficiency will increase directly. This proves that the improvement of the logistics system does not only have an administrative impact, but also has an impact on the effectiveness of the implementation of the organization's main tasks. The results of the analysis show that there is a positive and significant influence between the implementation of effective asset management and the improvement of operational efficiency in the Air Force Materiel Service (TNI AU). In addition, the use of logistics management information systems also contributes greatly to increasing accountability and reducing waste. This is in line with the findings of Nasution (2020) and Mahmudi (2019) which emphasize the importance of information system integration in public sector logistics management.

5. Operational and Organizational Implications

The impact of the implementation of asset management and information systems is not only on budget savings, but also on improving the overall quality of work of the organization. Here are some of the noticeable changes felt by respondents:

Table 2 Summary of Implications

Change	Before the System Integrated	After the System Integrated
Goods distribution time	5–7 business days	2–3 business days
Number of missing/incorrect reports	Often	Very rare
Goods tracking process	Manual (phone/email)	Real-time via system
A sense of responsibility of personnel	Depending on the initiative	Automatically monitored via system
Logistics transparency	Limited between sections	Open and accessible to superiors

From the table above, it can be seen that the implementation of an integrated system drives efficiency not only in terms of time and cost, but also in forming a more orderly and accountable work culture.

6. Research Contribution to Strategic Policy

More broadly, the findings in this study can be used as policy input for:

a. Chief of Staff of the Air Force,
b. Ministry of Defense,
c. and government agencies that manage state assets.

These data-driven recommendations can be used in:

a. Preparation of the TNI Air Force Strategic Plan (Renstra), especially in the field of logistics and information,
b. Improvement of the TNI Logistics Information System (SILOGTNI),
c. Formulation of the Regulation of the Minister of Defense on the Management of National Strategic Assets.

For example, if the asset management system tested in this study is adopted across all work units, there will be a national standard for digital-based defense logistics, as developed countries have done.

Conclusions and Suggestions

1. Conclusion

Based on the results of research that has been carried out with a quantitative approach through a survey of 50 respondents from various work units at the Air Force Materiel Service (TNI AU), it can be concluded that asset management and the use of information systems have a significant effect on budget efficiency. This is proven through multiple linear regression analysis which shows that the combination of the two variables is able to explain more than 68% of the variation in logistics budget efficiency.

The implementation of good asset management, such as orderly record-keeping, scheduled maintenance, and systematic disposal of goods, has prevented duplication of procurement, accelerated the distribution process, and supported the efficiency of logistics financing. Meanwhile, the use of digital-based information systems has been proven to facilitate real-time asset tracking, increase

reporting transparency, and speed up decision-making, ultimately contributing to the efficiency of state budget use in the military environment.

The synergistic effect between asset management and information technology also encourages the transformation of organizational culture towards more modern and accountable governance. Case studies at Pusbekmat and findings from other units show that when logistics management is carried out in an integrated manner, budget efficiency is no longer just an expectation, but can be achieved in real terms.

This research also has relevance to bureaucratic reform and the state financial management system based on the principle of value for money. In addition, from the academic side, this research strengthens the theory about the importance of integrating asset management and technology in supporting the effectiveness of public sector organizations, especially in the defense sector.

2. Suggestion

Based on the findings and conclusions above, the recommendations that can be given are as follows:

a. Increasing Human Resources Capacity

Regular training is needed for personnel involved in asset management and logistics so that they have technical competence and strategic understanding in using information systems and carrying out professional asset recording.

b. Equitable distribution of technological infrastructure

To support overall efficiency, investment is needed in information technology infrastructure, especially in regional work units that are still experiencing network and device limitations. An integrated logistics system will be optimal if it is applied evenly across all units.

c. Evaluation and Development of Continuous Systems

The Materiel Office needs to establish an internal evaluation unit tasked with periodically monitoring the effectiveness of the digital logistics system, providing feedback to system developers, and updating modules according to the dynamics of operational needs.

d. Inter-Unit Information System Integration

Logistics information systems within the Indonesian Air Force should be integrated between units and with the Ministry of Defense's information system so that data flows are more efficient and information redundancy is avoided.

e. Strengthening Policies and SOPs

The results of this research can be used as a basis for compiling or updating standard operating procedures (SOPs) for asset management and logistics distribution based on technology, including in aspects of control, reporting, and budget accountability.

With the above steps, budget efficiency in the management of TNI AU logistics can not only be significantly improved, but can also become a best practice model in the management of public sector assets in Indonesia. Optimal asset and material management in the TNI Air Force Materiel Service (TNI AU) has been proven to play a role in increasing operational efficiency and supporting budget efficiency. Recommendations that can be given are the need to increase the capacity of human resources in asset management, the maximum use of information technology, and continuous evaluation of the logistics system implemented.

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