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Defense Economics, Industrial Base, and Management Strategy: A Bibliometric Analysis Using VOSviewer

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Abstract

The purpose of this study is to use a bibliometric approach to examine the relationship between sustainable economies, industrial bases, and management practices. The method employed is a literature review and document analysis of scientific publication data from 2021 to 2025, which was studied using VOSviewer software. The study results show that the themes of management, markets, and industrial processes are the primary emphasis of the literature, with a high level of interconnectivity between variables. Network, overlay, and density visualizations show a movement in research topics from economics and markets to management strategies, industrial competitiveness, sustainability, and digital transformation. Despite generally consistent publication productivity, some critical subjects, such as risk management, human resource development, and industrial digitization, remain underexplored. This study emphasizes the necessity of taking an integrated strategy to building strategic industries that support sustainability, industrial resilience, and national independence in the face of increasingly complicated global dynamics.

Keywords: Defense Economics, Defense Industrial Base, Defense Management Strategy, Bibliometric Analysis, VOSviewer, Defense Policy, Strategic Management.

INTRODUCTION

Indonesia is projected to become the world's largest economy by 2030; however, its potential as a national economic engine is not being fully realized (Surahman et al., 2024; Sutisna et al., 2025). According to (Hotler et al., 2021;Nursalam & Yunanda, 2023) the development of the country's manufacturing sector has strategic potential as a catalyst for economic growth through the transfer of technology, the creation of job opportunities, and the expansion of the global economy. Optimising the national economy through the development of the manufacturing sector also has the potential to slow down the economy's rapid growth (Rusdiana et al., 2021).

However, the Indonesian manufacturing industry is currently facing numerous structural challenges, including the high dependence on export products and the inadequacy of the National Manufacturing Corporation in meeting the needs of the local population (Nursalam & Yunanda, 2023; Mashudi et al., 2023). This condition indicates the significant decline of the national energy sector, as well as the decline in human capital and the integration of the power grid, which ultimately undermined the sustainability of the Indonesian energy sector in comparison to the global trend (Sutisna et al., 2025).

Consequently, the objective of this study is to analyze the relationship between sustainable economics, sustainable industrial base, and sustainable management strategies through bibliometric analysis using the VOSviewer software. This framework is employed to identify research trends, topical classifications, and relevant research collaborations, thereby providing a comprehensive overview of the dynamics of investment, innovation, and the development of the sustainable energy sector, both globally and within the Indonesian context (Jiménez-Navia et al., 2020; Susan Cintia Damanik et al., 2024; Sutisna et al., 2025).

The development of the country's defense industry is crucial for the protection and stability of the nation, as well as the economic growth through the establishment of industrial clusters and the establishment of employment opportunities (Susdarwono, 2021). The systematic development of technology and industrialization in the energy sector is a critical component of the national energy strategy, particularly in order to achieve the energy sector's sustainability objective by 2045 (Herma Yudhi Irwanto et al., 2022). However, this issue has been addressed by a variety of factors, particularly those related to energy, infrastructure, and technological innovation, which have become the primary concern for the Indonesian energy sector (Nursalam & Yunanda, 2023).

This strategy is also crucial for addressing the supply chain of components and raw materials, as the majority of domestic manufacturing needs are met through imports (Novyanto & Faisol, 2022). Nevertheless, certain subsectors, such as the glass industry, are beginning to demonstrate potential for growth through the development of active national-scale companies (Irfan et al., 2023). In order to achieve a more comprehensive goal, the industry must be integrated from the ground up, with the government's regulatory framework responsible for identifying and enhancing the capabilities of the national energy sector (Nursalam & Yunanda, 2023; Wibowo, 2016).

Despite the fact that Indonesia has multiple strategic industries, the pace of technological advancement is significantly slower than that of other countries. As a result, it is necessary for the government to adopt a more comprehensive strategy to address the issue or, at the very least, to mitigate the risks associated with the implementation of technology-based security systems (Muslikin, 2023).

RESEARCH METHODS

This study employs a qualitative approach utilizing literature review and document analysis methods (Hasim, 2022). This method allows for the identification and evaluation of relevant scientific literature concerning defense economics, industrial bases, and management strategies, emphasizing publications available in leading scientific databases (Lomboan, 2022). This approach will involve a systematic search of journal articles, conference proceedings, and research reports to gather relevant data related to the topic under investigation. Subsequently, the data will be analyzed using the bibliometric method with the VOSviewer library to visualize the relationship between author, authorship, and publication, as well as to identify the dominant research trend and research area in the case study (Hasim, 2022). The objective is to provide a comprehensive overview of the current research landscape, identify areas that require further investigation, and propose policy recommendations based on the science.

RESULTS AND DISCUSSION

The analysis will result in the identification of the most influential authors, the most influential publications, and the most influential institutions, as well as the establishment of a collaborative network to facilitate the development of intellectual dynamics in this field (Chusumastuti et al., 2023; Sandip Solanki et al., 2023).

Table 1. Statistical Value Metric Indicators

Metric Indicators	Statistical Value
Year of Publication	2021 – 2025
Number of Papers	1000
Total Citations	1263

Citations per Year	252.60
Citations per Paper	1.26
H-index	16
g-index	23
Authors per Paper	1.67
HL, Norm	10
hA-index	6

Source: Publish Or Perish, 2026

Standard Maximum Productivity Based on the aforementioned data, it is evident that during the five-year period (2021 to 2025), there was a proliferation of academic titles. In terms of collaboration, approximately 1,67 authors submitted a single paper, indicating that collaboration in this publication is not limited to small groups or informal collaborations. Quantity and Quality of Reference As a result of the scientific influence, all of the aforementioned works have received 1263 citations from various researchers as of the beginning of 2026. This results in an average annual increase of 252,60 seats. The significance of this study is more clearly evident in the h-index indicator, which is 16 and the g-index indicator, which is 23. Despite the fact that the average number of observations is 1.26, the g-index indicator is 23. This confirms that there are 16 articles that consistently serve as the primary focus with a high number of references. If we examine the distribution of the Accumulative Citation Count (ACC) or the number of citations, there are 121 articles that have been cited at least once. However, there is only one case of adversity that has resulted in more than 20 complaints. This implies that the research design necessitates time to be developed; however, there are several key concepts that are particularly relevant to the field.

Table 2. Top 10 Research Article Citations

No	Citation	Author	Tittle	Year
1	60	Abhilasha Meena, Sanjay Dhir, Sushil Sushil	Coopetition, strategy, and business performance in the era of digital transformation using a multi-method approach: Some research implications for strategy and operations management	2024
2	47	Justin George, Todd Sandler	NATO defense demand, free riding, and the Russo-Ukrainian war in 2022	2022
3	35	Matt Marx, Aaron Fuegi	Reliance on science by inventors: Hybrid extraction of in-text patent-to-article citations	2021
4	33	Federico Etro	Product selection in online marketplaces	2021
5	33	Kell Jones, Luigi Mosca, Jennifer Whyte, Andrew Davies, Jacqueline Glass	Addressing specialization and fragmentation: product platform development in construction consultancy firms	2021
6	31	Sunder Ali Khowaja, Parus Khuwaja	Q-learning and LSTM based deep active learning strategy for malware defense in industrial IoT applications	2021
7	25	Ramin Asadi, Suzanne Wilkinson, James Olabode Bamidele Rotimi	Towards contracting strategy usage for rework in construction projects: a comprehensive review	2021

8	24	Jared Oakley, Alan J. Bush, William C. Moncrief, Daniel Sherrell, Emin Babakus	The role of customer entertainment in B2B sales strategy: Comparative insights from professional buyers and salespeople	2021
9	22	Jeffrey T. Prince, Scott Wallsten	How much is privacy worth around the world and across platforms?	2022
10	20	Bruno C. Silva, Antonio C. Moreira	Entrepreneurship and the gig economy: A bibliometric analysis	2022

Source: Processed by the author, 2026

From the "Top 10 Research Article Citations" data, a wide range of topics is evident, including the digital transformation and the geopolitical issue: First Stage: Abhilasha Meena et al. (2024) conducted a study on the strategy of cooperation in the digital era for a company with 60 locations, exclusively within a single year. Issue Contemporary: Justin George and Todd Sandler's (2022) research on the Russia-Ukraine conflict and NATO's defense garnered significant interest from 47 countries. Teknologi & Inovasi: The topic of artificial intelligence (Q-learning & LSTM) by Sunder Ali et al. (2021) has 31 citations, showing that people are quite interested in IoT security. Etika & Privasi: Jeffrey T. Prince & Scott Wallsten's (2022) research on privacy nilai has been cited 22 times, which is highly relevant to the matter of data privacy that we are studying.

Table 3. Number of Publications With Keywords Defense Economics, Industrial Base, and Management Strategy

No	Year of Publication	Amount
1	2021	174
2	2022	157
3	2023	240
4	2024	202
5	2025	226

Source: Processed by the author, 2026

This data indicates a significant fluctuation in the volume of publications over the past five years. Despite the fact that there have been several instances of volatility in the last few years, there is a consistent upward trend. In the initial period of 2021, there were 174 publications. However, there was a significant decrease of approximately 9.7% in 2022, with 157 units being lost. This interruption is a temporary event in the time frame that is being observed, indicating the presence of an external factor or a change in business operations that affects productivity during the specified period. The year 2023 is a critical juncture, with a significant decline in the number of units, reaching 240. This is the most significant factor (highest performance) in the data. The increase from the previous year has reached approximately 52.8%, indicating a significant increase in the number of public activities or the realization of initiatives that were initiated in the previous year. After reaching its peak in 2023, the number of publications experienced a decline, reaching 202 units in 2024.

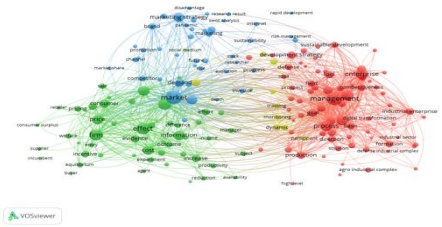


Figure1. Network Visualization
Source: Vosviewer, edited by the author, 2026

The Red Cluster is a cluster with a high number of keywords and a high degree of network connectivity, indicating that the management theme is dominant in the industrial and sustainability context. The primary keywords in this cluster include management, enterprise, process, competitiveness, production, industrial enterprise, defense, and digital transformation. The cross-cutting relationship within this cluster suggests that the primary focus of the literature is on management, production processes, and industrial waste. The close relationship between management and defense also influences the role of management strategy in the development of the defense industry and national industrial complex.

The Green cluster focuses on the macroeconomic and market dimensions, with key terms such as market, consumer, price, business, cost, effect, information, and productivity. The large number of keywords in this cluster creates a dense network, increasing interest in market mechanisms, consumer behavior, cost efficiency, and the economic impact of industrial activities. The strong relationship between market, pricing, and consumer indicates that economic analysis is an important tool for understanding the workings and progress of industries, including manufacturing.

Marketing, marketing strategy, brand, promotion, channel, social media, internet, and SWOT analysis are some of the topics covered in Cluster Blue. The number of kata kunci in this cluster is high, with a large network but not as dense as in merah and hijau clusters. This demonstrates that marketing and communication strategies are critical development issues, particularly in the context of market growth, industrialization, and adapting to the advancement of digital technology.

In comparison to other clusters, the yellow cluster has a slightly higher number of keys, but it still functions as an inter-group relationship. Development strategy, sustainable development, risk management, training, monitoring, and progress are the main terms in this cluster. This cluster's location between the merah and hijau clusters indicates that it serves as a bridge between the managerial and economic aspects.

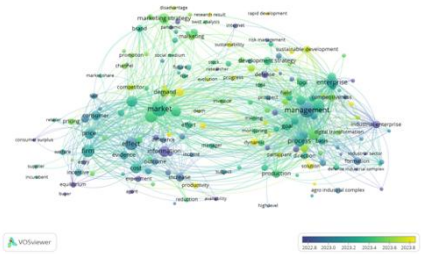


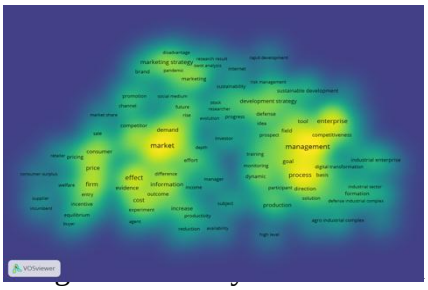
Figure2. Overlay Visualization
Source: Vosviewer, edited by the author, 2026

In the nascent phase, represented by a color gradient from dark blue to greenish blue, scientific literature significantly emphasizes the fundamental dimensions of the economy and the dynamics of market structures. Key terminology such as price, consumer, firm, cost, information,

and effect dominates this discourse, reflecting the researchers' focus on market mechanisms, cost optimization, and the evaluation of economic impact. This train shows that the initial foundation of the defense economy was built thru an analytical-conceptual approach that sought to dissect the causal relationships within the economic ecosystem.

As we entered the intermediate era, which was represented by the color green, the research focus shifted to management and strategic challenges. Management, process, production, enterprise, and competitiveness are among the most prominent and fundamental keywords in the network. Researchers are increasingly focusing on industrial governance, process efficiency, and firm competitiveness as critical aspects in improving sectors, including the defense industry. At this stage, the link between economic and management factors is strengthening, indicating a more integrated strategy.

Keywords connected to long-term development, innovation, and sustainability arose recently, represented by light green to yellow colors, including development strategy, sustainable development, digital transformation, risk management, training, and monitoring. The introduction of these issues represents a shift in study focus toward adaptable and sustainable methods, as well as global challenges such as technology disruption, digital transformation, and industrial sustainability. In the defense sector, this trend shows that research is no longer just focused on production capacity and efficiency, but also on the industry's ability to adapt to changes in the strategic and technological landscape.



Source: Vosviewer, edited by the author, 2026

Meanwhile, the prevalence of the keyword "market" underlines the importance of the economic dimension and market mechanisms as the foundation for analysis, particularly when examining industry performance and developments. The keyword "process" is also in a high-density area, indicating that talks regarding production processes, business processes, and operational efficiency are significant and widely researched topics. The close link between management, market, and process demonstrates that existing literature integrates economic and management viewpoints when assessing industrial development, including the military industry.

Keywords such as "enterprise," "impact," "information," "pricing," "firm," "competitiveness," and "development plan" exist in areas of medium density, denoted by the color green. These keywords indicate supporting issues that contribute significantly to the main study. Competitiveness and enterprise, for example, emphasize corporate competitiveness and industry structure, whereas effect, information, and pricing are concerned with assessing policy impacts and economic efficiency. Furthermore, the emergence of development strategy and sustainable development at medium densities suggests that long-term development and sustainability issues are gaining traction, albeit not as a primary focus as management and market themes are.

The low-density area, which is dominated by bluish-green to blue colors, has phrases like "risk management," "training," "monitoring," "digital transformation," "agro-industrial complex," and "military industrial complex." The low density in this region implies that there are still few publications on these issues or that they have not been thoroughly researched. This condition provides chances for more study, notably in combining digital transformation, risk

management, and human resource development to the improvement of the defense industry and national strategic industries.

CONCLUSION

This study found that studies on military economics, industrial base, and management strategy in the context of sustainability advanced significantly between 2021 and 2025. A bibliometric analysis using VOSviewer revealed that management, market, and industrial processes dominate the literature, with substantial linkages between economic elements, industrial governance, and management methods. Network visualization indicates a shift in study priorities, from economic and market approaches to managerial concerns, industrial competitiveness, sustainability, and digital transformation. Although publishing productivity is largely consistent, keyword density analysis reveals that research into risk management, human resource development, and digital transformation in crucial industries remains limited. As a result, this study emphasizes the importance of an integrated approach that includes sustainable economics, industrial base development, and adaptive management measures to help national critical industries maintain their resilience and independence.

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