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The Prospect of Using Artificial Intelligence in TNI Ship Information Systems as a Manifestation of a Resilient Maritime Defense Industry

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Abstract

This research investigates the prospects of using Artificial Intelligence (AI) in the Indonesian Navy's ship information system as a crucial step in developing a robust and innovative maritime defense industry. The primary focus is on the application of AI technology in the ship information system, analyzing various aspects, including the potential implementation of AI in monitoring and analyzing maritime waters, technical and security challenges that may arise, expected benefits, and the strategic impact of AI implementation in Indonesia's maritime defense industry. The research method employs the Systematic Literature Review (SLR) method, providing a systematic and comprehensive approach to collecting, evaluating, and analyzing relevant literature in a specific field. This study involves literature searches using keywords such as artificial intelligence, information systems, maritime defense industry, Indonesian defense, and Indonesian Navy ships from 2011 to 2023 in various sources such as scholarly journals, conferences, and online databases. The research findings indicate that the use of artificial intelligence in the Indonesian Navy's ship information system has significant potential to improve maritime monitoring, threat detection, operational efficiency, and international collaboration. The integration of AI with advanced sensors such as radar, sonar, and thermal cameras enables more accurate real-time monitoring of activities in maritime waters. Higher accuracy in monitoring and threat detection also contributes to increased situational awareness and smarter decision-making by operational leaders in the Indonesian Navy. Despite the substantial benefits, AI implementation faces several challenges, including initial investment costs, infrastructure availability, personnel training, data security, ethical regulations, dependence on foreign technology, integration and compatibility issues, AI technology reliability, cultural and organizational changes, and long-term benefits. To address these challenges, it is recommended that the government allocates budgets wisely, develops adequate technological infrastructure, provides personnel training, and formulates ethical regulations. Strengthening independence in the development of domestic AI technology is also crucial.

Keywords : Artificial Intelligence, Information Systems, Maritime, Defense Industry

INTRODUCTION

The era of globalization and rapid technological advancements has brought a transformative impact on various aspects of human life (Jahidi & Hafid, 2017). The information technology revolution, encompassing developments in computing, connectivity, and artificial intelligence (AI), has deeply and widely affected how humans interact, work, and adapt to their environment (Savitri, 2019). One of the most notable achievements of these advancements is the emergence of artificial intelligence, a branch of computer science that teaches machines to perform tasks previously only achievable by humans (Pasaribu, 2022). Artificial intelligence (AI) has emerged as a revolutionary innovation that has reshaped various sectors of human life (Serdianus & Saputra, 2023). AI's ability to perform complex data analysis, automated decision-making, and adaptation to dynamic situations has the potential to revolutionize various sectors, including the defense domain.

In an era where information is considered a valuable asset, the development of effective and efficient information systems is imperative (Napitupulu, 2017). Robust information systems play a central role in supporting intelligent decision-making and timely operational management (Rukmana, 2023). In the context of defense, particularly in the maritime defense industry,

information systems serve as the backbone supporting monitoring, analysis, and responsive actions to potential threats. The complexity of operations and dynamics of water environments demands swift responses, and a strong and integrated information system is crucial for successful monitoring, analysis, and decision-making tasks. The utilization of information technology in the form of sensors, data processing, and communication has shifted the traditional paradigm in defense, driving higher operational efficiency and more accurate decision-making (Gubbi, 2013).

As the world's largest archipelagic nation with over 17,000 islands, Indonesia faces unique challenges in safeguarding its sovereignty and maritime security (Madinier, 2022). The maritime defense industry plays a pivotal role in building robust naval defense capabilities (Setiawan, 2022). Modern warships must not only possess strong military power but also be equipped with advanced technology supporting monitoring, detection, and responsive actions to potential threats. The success of the maritime defense industry has direct implications on national security, image, and sovereignty (Marsetio & Ritonga, 2018). In this regard, the maritime defense industry must also involve the provision of up-to-date information systems that can integrate data from various sensors, analyze current information, and generate reliable decisions in a short timeframe.

Facing the increasing dynamics and complexities in maritime waters, artificial intelligence (AI) emerges as a promising solution. AI technology has significant potential to enhance information system capabilities in various aspects. AI's ability to analyze data at incredible speeds and recognize patterns that are difficult for humans to detect provides a significant advantage in rapidly changing defense situations. The use of AI in the Indonesian Navy's ship information system could enable more accurate monitoring and faster responses to evolving situations in maritime waters. In threat scenarios, AI can assist in identifying potential dangers, analyzing data from various sources to recognize threat patterns, and enabling faster and more accurate decision-making for operational leaders. Furthermore, the use of AI can also support the development of autonomous ships capable of operating without human crews, opening doors for new innovations in naval operations.

The objective of this research is to comprehensively investigate the prospects of using artificial intelligence in the Indonesian Navy's ship information system as a crucial step in developing a robust and innovative maritime defense industry. With a focus on the application of AI technology in ship information systems, this journal will analyze various aspects, including the potential implementation of AI in monitoring and analyzing maritime waters, potential technical and security challenges, expected benefits, and the strategic impact of AI implementation in Indonesia's maritime defense industry.

RESEARCH METHODS

The literature review in this study employs the Systematic Literature Review (SLR) Method. The Systematic Literature Review (SLR) Method is a systematic and comprehensive approach to gather, evaluate, and analyze relevant literature in a specific field (Triandini, 2019). SLR aims to provide a comprehensive overview of existing knowledge, identify gaps in the literature, and formulate a deeper understanding of the researched topic. In SLR, structured steps are meticulously followed. Firstly, the planning phase is conducted to outline objectives, inclusion and exclusion criteria for literature, as well as the search strategy to be employed. Subsequently, literature search is carried out carefully using relevant keywords across various sources such as scholarly journals, conferences, and online databases.

Upon collecting literature, the selection phase is executed by applying pre-determined inclusion and exclusion criteria. After literature selection, evaluation and analysis are performed.

Literature is assessed for quality, methodology, findings, and relevance to the research topic. Relevant data is extracted and synthesized to identify trends, patterns, or common findings within the analyzed literature. The results of analysis are then interpreted and presented in easily comprehensible forms, including narrative summaries and visualizations such as diagrams or tables.

The literature search technique utilizes keywords aligned with the research questions. Keywords used include artificial intelligence; information system; maritime defense industry; Indonesian defense; Indonesian Navy ships. Article searches are conducted in both English and Indonesian languages, using data sourced from journals and research articles spanning from 2011 to 2023. The author conducted data source searches across various databases, including Google Scholar and Sciencedirect.

RESULT AND DISCUSSION

Schematic or Diagram (PRISMA)

Chart 1 depicts the article selection process using guidelines from the Preferred Reporting Systematic Reviews and Meta-analysis (PRISMA), which is designed to assist researchers in conducting and reporting systematic reviews and meta-analyses in a more transparent, detailed, and consistent manner (Fatimah, 2021). The initial search yielded a total of 69 articles from the years 2011 to 2023. Subsequently, the articles underwent screening, resulting in 7 articles being included in the next stage. The quality of the articles was assessed, leading to the synthesis of 7 articles in the final report of the literature review.

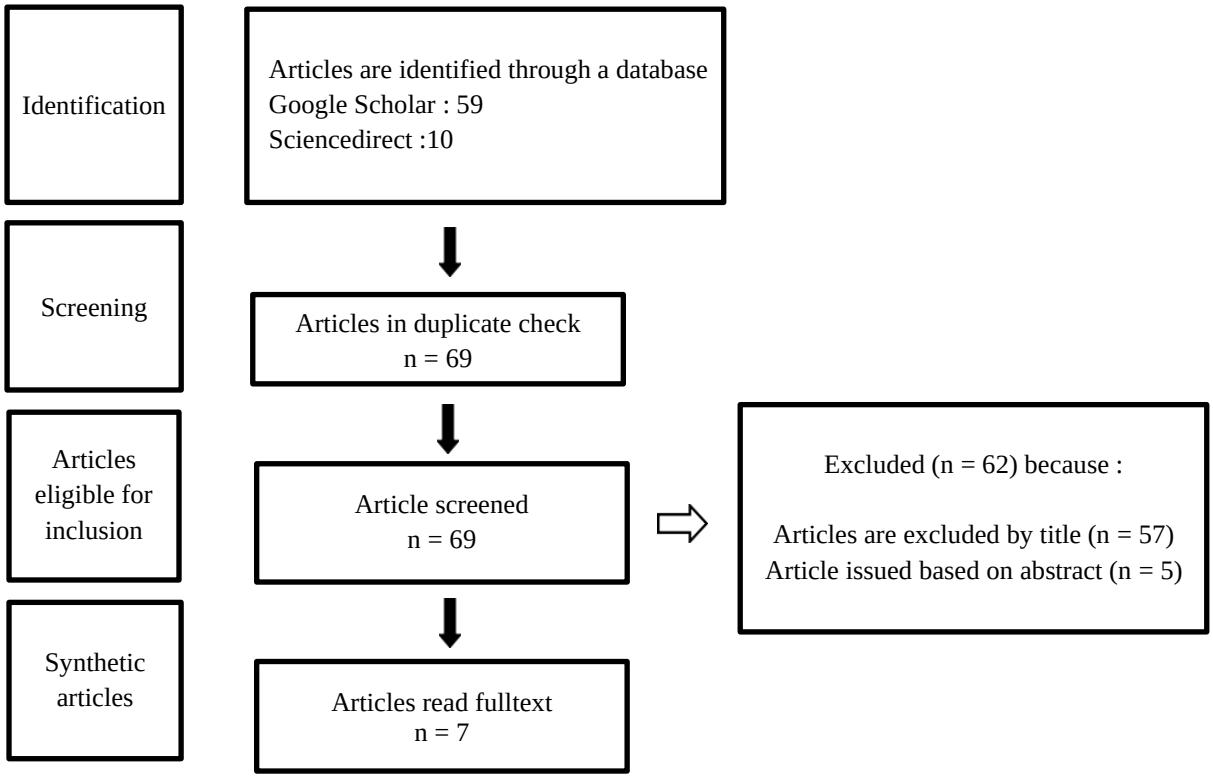

Chart 1. PRISMA Diagram

The researchers conducted selection of the obtained articles and extracted data from each article obtained from various databases. The findings of the articles were reviewed regarding the prospects of artificial intelligence utilization in the Indonesian Navy's ship information system as a manifestation of a resilient maritime defense industry.

Table 1. Articles Related to the Prospects of Using Artificial Intelligence in the Indonesian Navy's Ship Information System as a Manifestation of a Robust Maritime Defense Industry

Title and Researchers	Purpose	Result
Analisa Dukungan Internet of Things (IoT) terhadap Peran Intelejen dalam Pengamanan Daerah Maritim Indonesia Wilayah Timur (Turyadi, I. U., 2021)	To analyze how Internet of Things (IoT) technology can support the role of intelligence in securing Indonesia's eastern maritime area.	With rapid technological advancements and increasingly comprehensive infrastructure, the role of intelligence in securing the Maritime Region of Eastern Indonesia can be enhanced through the development and presence of such technology, particularly the advancement of the Internet of Things (IoT). Each expanse of observation area holds intelligence information that can be updated in real-time, allowing for predictions on the development of an observation area over time without the need for extensive manpower. Furthermore, all data can be accessed through laptops or smartphones.
Peningkatan Kualitas Industri Pertahanan Strategis Guna Membangun Kekuatan Pertahanan Maritim dalam rangka Mewujudkan Visi Poros Maritim Dunia (Chadhafi, M. I., 2021)	To provide an understanding of the importance of strengthening Indonesia's maritime defense and how to enhance the quality of the strategic defense industry..	The Indonesian government needs to strengthen its international bargaining position through the enhancement of the strategic defense industry. The strategic defense industry is a crucial reserve that transforms national resources into defense power, prepared to face various threats, both military and non-military. The presence of the strategic defense industry in Indonesia provides the advantage of self-reliance in the defense system, in line with prioritized plans and accommodations for capabilities and threats.
Optimalisasi Pemanfaatan Teknologi Informasi Di Pusinfomar TNI Guna Mendukung Tugas TNI Angkatan Laut (Fadli, A., Guyana, D., & Tobing, C. L., 2022)	To formulate various aspects related to Indonesia's maritime affairs based on the analysis of interests, threats, and naval strengths.	The strategy and efforts to address issues related to computer system software involve the acquisition, updating, and modernization of computer system software; for computer system hardware, it includes procurement, construction, and modernization of computer system hardware and supporting organizational work; in terms of human resources, it entails recruitment, education, and training focusing on qualifications in the field of information technology; furthermore, the integration of TNI's Pusinfomar is achieved through prioritizing command relationships, coordination, and communication with internal TNI branches and relevant maritime-related institutions.

Implementation of Integrated Maritime Surveillance System (IMSS) Technology for the Indonesian Navy in Increasing the Security of the Jurisdictional Marine Area (Ardi, F. C., 2023)	To analyze the impact and benefits of IMSS implementation on the security of Indonesia's maritime region, while considering the sustainability of natural resources and the need to maintain regional stability.	Research indicates that the Integrated Maritime Surveillance System (IMSS) provides advantages in maritime monitoring, threat detection, and rapid response in Indonesian Navy waters. The integration of advanced sensors enables the identification of illicit activities such as drug smuggling and suspicious foreign vessel movements. Data analysis and artificial intelligence within the IMSS process information for operational actions and enhance cross-institutional and international cooperation. Despite initial cost challenges, the long-term benefits of improved monitoring and maritime security are expected to outweigh the implementation and maintenance costs of the IMSS.
High-Tech Defense Industries: Developing Autonomous Intelligent Systems (Reis, J., Cohen, Y., Melão, N., Costa, J., & Jorge, D., 2021)	To provide a comprehensive overview of the existing literature on the development of autonomous intelligent systems in the defense industry, and to suggest areas for further research and empirical testing.	The results indicate that the defense industry is developing autonomous intelligent systems in three modes: full autonomous operation, partial autonomous operation, and autonomous intelligent decision-making. Additionally, it's important to note that at the strategic level of warfare, full automation is not feasible as human intervention is required. However, at the tactical level of warfare, the defense industry may evolve as structured decision-making and complex analytical-cognitive tasks are carried out here. Robotics and artificial intelligence can assist in executing these decisions and tasks much more effectively than humans.
Naval Artificial Intelligence (Kulbiej, E., and P. Wołejsza, 2017)	To explore the latest advancements in navigation technology for ships, including the Navigational Decision Support System (NDSS) and Navdec system.	International regulations pose a primary constraint, and the process of changing or introducing new regulations is usually complex and tedious. However, from a social standpoint, this transformation is highly desirable with a consistent increase in volume while reducing the number of individuals interested in working as sailors. Sailors will perform their jobs on land. The length of foreign contracts should in turn reduce transportation costs, although the Author anticipates an initial increase in costs— even at the aforementioned Delta terminal, where personnel costs will increase by 20% as a result of autonomous system implementation.
Optimalisasi Sistem Informasi Personel dengan Menggunakan Internet of Things	To optimize the use of IoT in the Indonesian Navy personnel information system to	The research results indicate that the Indonesian Navy (TNI AL) has limited Internet of Things (IoT) capabilities due to manual processing using computer equipment. The influencing factors of TNI AL's IoT encompass both internal

dalam Rangka Mendukung Tugas TNI AL (Suryawan, W. E., & Ginting, M. L., 2023)	enhance organizational performance.	and external factors, both of which are crucial and strategic in enhancing performance and supporting TNI AL's tasks. The most dominant factor is the absence of specialized human resources to handle IT fields and their equipment, leading TNI AL to rely on third parties to develop the TNI AL's Sipers system and applications.

Source : Data Processed by Researchers, 2023

Artificial Intelligence (AI) has become one of the key innovations in the ever-evolving era of information and communication technology. AI's ability to process data, analyze patterns, and make decisions has transformed the way we think and operate across various sectors, including maritime defense.

Enhancing Maritime Surveillance and Threat Detection

The utilization of Artificial Intelligence (AI) in the Indonesian Navy's ship information system holds significant potential for substantial improvements in maritime surveillance and threat detection. By integrating AI technology with advanced sensors like radar, sonar, and thermal cameras, the ship information system can achieve more accurate and detailed real-time monitoring of activities in waters. In this context, AI enables the identification of suspicious behavioral patterns, such as drug smuggling, fish theft, and the movement of suspicious foreign vessels (Quest, 2018). With swift and accurate data analysis, AI empowers operational teams to respond to security incidents more precisely and efficiently, reducing the potential emergence of threats (Yudistriansyah, 2019).

The higher accuracy levels in maritime surveillance and threat detection also contribute to enhancing situational awareness for leaders within the Indonesian Navy's operations. With more comprehensive and verified information, decisions can be made wiser and in a timely manner. Consequently, responses to threats can be executed faster and more responsively, preventing potential escalation of dangers that could jeopardize water security. Furthermore, the use of AI in the ship information system allows for more proactive monitoring and detection of various threats that might arise in maritime waters. Artificial intelligence can identify unusual or suspicious behavioral patterns that traditional methods might overlook. This helps narrow gaps in monitoring and ensures maximum water security. In the face of increasingly complex and dynamic threats in maritime waters, the implementation of AI in maritime surveillance and threat detection is a strategic step to uphold national sovereignty and security. The enhanced ship information system empowered by AI provides the capability to detect, analyze, and address various potential threats more effectively, ensuring optimal protection of national waters.

Operational Efficiency and Decision-Making

One of the main benefits of AI deployment is its ability to process and analyze data rapidly and accurately (Azzahra, 2021). AI software can filter relevant and critical information for ship operations, sparing operational teams from insignificant data. This has the potential to save time and resources, allowing for a greater focus on aspects that require deeper attention. AI utilization also aids in smarter and timelier decision-making (Masrichah, 2023). Having access to up-to-date and verified data, leaders within the Indonesian Navy's operations can make more informed decisions. AI-conducted data analysis provides deep insights into ongoing situations, enabling more accurate and responsive decisions when facing various challenges.

Higher operational efficiency can also lead to long-term cost savings (Yang, 2016). Through using artificial intelligence in the ship information system, potential human errors can be minimized, reducing the risk of resource and time loss. Over time, AI usage can optimize resource utilization and enhance overall productivity in ship operations. The implementation of

artificial intelligence in operational efficiency and decision-making also results in an improvement in the operational readiness of the Indonesian Navy's ships. With more accurate information, operational processes can be executed smoother and more coordinated. This enhances readiness in facing various scenarios and situations that might arise in maritime waters, maintaining a high level of vigilance in upholding national security and sovereignty.

Enhanced Cross-Institutional and International Collaboration

The integration of Artificial Intelligence (AI) within the Indonesian Navy's ship information system holds significant implications for improved cross-institutional and international collaboration in safeguarding maritime security. AI integration in maritime surveillance can effectively serve as a link between various defense institutions and related sectors, facilitating more efficient information exchange (Fraga, 2016). For instance, in the context of cross-institutional collaboration, an AI-enhanced ship information system can assist the Navy in collaborating with environmental and fisheries agencies. When suspicious activities occur in waters, such as illegal fishing by a vessel, information from the AI system can be provided to relevant authorities in the fisheries sector for appropriate law enforcement measures. This creates better cooperation between the defense sector and other sectors in maintaining environmental and economic sustainability.

At the international level, the use of AI in the ship information system can also enhance collaboration with partner countries (Li, 2017). For example, when suspicious movements of foreign vessels occur in bordering waters, information generated by the AI system can be immediately shared with partner countries through defense cooperation mechanisms. This allows countries to collectively monitor and address potential cross-border threats, such as illegal trading or drug smuggling. Another concrete case example is when an AI-equipped ship information system detects suspicious vessel movement patterns around a country's waters. This information can be promptly relayed to partner countries through defense cooperation channels, such as bilateral or multilateral maritime cooperation agreements. With data generated by AI, partner countries can respond quickly and coordinatedly to potential threats, such as smuggling efforts or other security threats. Thus, the use of artificial intelligence in the Indonesian Navy's ship information system plays a crucial role in strengthening cross-institutional and international collaboration. In an increasingly interconnected and complex world, the information generated by AI can serve as a starting point for effective collaboration, allowing various stakeholders to work together in maintaining the security and sovereignty of global maritime waters.

Challenges and Implications

The implementation of Artificial Intelligence (AI) in the Indonesian Navy's ship information system brings forth challenges and implications that need careful consideration. While the potential benefits are substantial, several factors must be addressed for AI implementation to proceed smoothly and effectively. Here are some key points regarding challenges and implications of using AI in the ship information system:

1) Initial Investment Costs, Integrating AI technology requires a significant upfront investment (Haqqi & Wijayati, 2019). Procuring hardware and software, as well as personnel training, can incur substantial costs. This challenge necessitates adequate budget allocation by the government and relevant institutions to ensure the success of AI implementation.
2) Infrastructure Availability, The success of AI usage relies on having adequate technological infrastructure. Fast and stable internet networks, sufficient hardware, and efficient system integration are required for optimal AI operations (Hua, 2021). Countries need to invest in adequate technological infrastructure to support AI implementation.
3) Personnel Training, AI usage demands specialized skills in management and operation. Training for personnel involved in the use and maintenance of the ship information system

with AI technology is crucial. Effective training is needed to ensure personnel understand and optimize AI potential.

4) Data Security, Data generated and analyzed by AI includes sensitive information about operations and security. Protecting data from cyber threats and security breaches is a critical concern. Strong security systems must be implemented to prevent unauthorized access and maintain information confidentiality.
5) Regulation and Ethics, The use of AI in a military and defense context requires clear regulatory guidelines. Ethics in AI usage, particularly in automated decision-making with potentially significant impact, also needs attention. Countries need to develop appropriate regulatory frameworks to govern AI usage in the ship information system.
6) Foreign Technology Dependence, Relying on AI technology from foreign suppliers can pose a potential risk of national security vulnerability. Efforts to develop domestic AI technology become essential to ensure control over the ship information system.
7) Integration and Compatibility, The integration of AI into the ship information system must be compatible with existing infrastructure. Challenges in integrating AI with existing systems and ensuring interoperability can arise, requiring thorough planning and testing.
8) Reliability and Dependability, AI technology may encounter issues of reliability and dependability, such as hardware or software errors that could disrupt normal system operations. Monitoring and maintenance mechanisms must be implemented to ensure optimal system availability.
9) Cultural and Organizational Changes, The introduction of AI can alter the culture and operational procedures within defense institutions. Changes in organizational structure, operational processes, and policies may be necessary to effectively accommodate the use of AI.
10) Long-Term Benefits, Despite challenges in AI implementation, long-term benefits such as improved maritime surveillance, operational efficiency, and enhanced collaboration with institutions and partner countries may outweigh the costs and efforts expended.

By understanding and addressing these challenges, the country can effectively plan and execute the implementation of artificial intelligence in the Indonesian Navy's ship information system, resulting in significant positive impacts on maritime defense and national security.

CONCLUSION

The use of Artificial Intelligence (AI) in the Indonesian Navy's ship information system promises a significant improvement in maritime monitoring, operational efficiency, and international collaboration. The benefits of AI include more accurate monitoring of maritime activities, faster decision-making, and enhanced collaboration with defense institutions and related sectors. However, AI implementation faces several challenges, such as initial costs, infrastructure availability, and data security. Therefore, it is suggested that the government allocates budget wisely, develops adequate technological infrastructure, provides personnel training, and formulates ethical regulations to address potential implications. Additionally, independence in the development of domestic AI technology needs to be strengthened. By understanding and overcoming these challenges, the implementation of AI in the Indonesian Navy's ship information system can have a significantly positive impact on maritime defense and national security.

REFERENCES

Ardi, F. C. (2023). Implementation of Integrated Maritime Surveillance System (IMSS) Technology for the Indonesian Navy in Increasing the Security of the Jurisdictional Marine Area. International Journal of Social and Management Studies, 4(4), 26-32.

Azzahra, B. (2021). Akuntan 4.0: roda penggerak nilai keberlanjutan perusahaan melalui artificial intelligence & tech analytics pada era disruptif. Jurnal Riset Akuntansi Dan Keuangan, 16(2), 87-98.

Chadhafi, M. I. (2021). Peningkatan Kualitas Industri Pertahanan Strategis Guna Membangun Kekuatan Pertahanan Maritim dalam rangka Mewujudkan Visi Poros Maritim Dunia. Jurnal Maritim Indonesia (Indonesian Maritime Journal), 9(2), 207-214.

Fadli, A., Guyana, D., & Tobing, C. L. (2022). Optimalisasi Pemanfaatan Teknologi Informasi Di Pusinfomar Tni Guna Mendukung Tugas Tni Angkatan Laut. NUSANTARA: Jurnal Ilmu Pengetahuan Sosial, 9(3), 517-531.

Fatimah, S., Eva, N., & Farida, I. A. (2021). Flow sebagai prediktor keterlibatan akademik pada mahasiswa: systematic review dan meta-analysis. In Seminar Nasional Psikologi dan Ilmu Humaniora (SENAPIH) (Vol. 1, No. 1, pp. 393-405).

Fraga-Lamas, P., Fernández-Caramés, T. M., Suárez-Albela, M., Castedo, L., & González-López, M. (2016). A review on internet of things for defense and public safety. Sensors, 16(10), 1644.

Gubbi, J., Buyya, R., Marusic, S., & Palaniswami, M. (2013). Internet of Things (IoT): A vision, architectural elements, and future directions. Future generation computer systems, 29(7), 1645-1660.

Haqqi, H., & Wijayati, H. (2019). Revolusi industri 4.0 di tengah society 5.0: sebuah integrasi ruang, terobosan teknologi, dan transformasi kehidupan di era disruptif. Anak Hebat Indonesia.

Hua, H., Wei, Z., Qin, Y., Wang, T., Li, L., & Cao, J. (2021). Review of distributed control and optimization in energy internet: From traditional methods to artificial intelligence-based methods. IET Cyber-Physical Systems: Theory & Applications, 6(2), 63-79.

Jahidi, I., & Hafid, M. (2017). Transformasional leadershif dan servant leadership: tantangan kepemimpinan dalam menghadapi era global. CosmoGov: Jurnal Ilmu Pemerintahan, 3(2), 219-231.

Kulbiej, E., & Wołejsza, P. (2017, June). Naval artificial intelligence. In 12th International Conference on Marine Navigation and Safety of Sea Transportation TransNav (pp. 21-23).

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. Frontiers of Information Technology & Electronic Engineering, 18, 86-96.

Madinier, R. (2022). Revolusi Tak Kunjung Selesai. Kepustakaan Populer Gramedia.

Marsetio, M., & Ritonga, R. (2018). Representasi Kapal Selam Indonesia dalam Perspektif Pertahanan Regional. Jurnal Kajian Stratejik Ketahanan Nasional, 1(2), 87-94.

Masrichah, S. (2023). Ancaman Dan Peluang Artificial Intelligence (AI). Khatulistiwa: Jurnal Pendidikan dan Sosial Humaniora, 3(3), 83-101.

Napitupulu, D. (2017). Kajian Peran Cyber Law Dalam Memperkuat Keamanan Sistem Informasi Nasional. Deviance Jurnal Kriminologi, 1(1), 100-113.

Pasaribu, M., & Widjaja, A. (2022). Artificial Intelligence: Perspektif Manajemen Strategis. Kepustakaan Populer Gramedia.

Quest, L., Charrie, A., du Croo de Jongh, L., & Roy, S. (2018). The risks and benefits of using AI to detect crime. Harv. Bus. Rev. Digit. Artic, 8, 2-5.

Reis, J., Cohen, Y., Melão, N., Costa, J., & Jorge, D. (2021). High-tech defense industries: Developing autonomous intelligent systems. Applied Sciences, 11(11), 4920.

Rukmana, A. Y., Rahman, R., Afriyadi, H., Moeis, D., Setiawan, Z., Subchan, N., ... & Kusuma, A. T. A. P. (2023). PENGANTAR SISTEM INFORMASI: Panduan Praktis Pengenalan Sistem Informasi & Penerapannya. PT. Sonpedia Publishing Indonesia.

Savitri, A. (2019). Revolusi industri 4.0: mengubah tantangan menjadi peluang di era disrupsi 4.0. Penerbit Genesis.

Serdianus, S., & Saputra, T. (2023). Peran artificial intelligence ChatGPT dalam perencanaan pembelajaran di era revolusi industri 4.0. Masokan: Ilmu Sosial dan Pendidikan, 3(1), 1-18.

Setiawan, D. I., Werijon, W., & Widyanto, D. (2022). Optimalisasi Diplomasi Tni Angkatan Laut Dalam Mendukung Kebijakan Indonesia Sebagai Poros Maritim Dunia. NUSANTARA: Jurnal Ilmu Pengetahuan Sosial, 9(1), 151-159.

Suryawan, W. E., & Ginting, M. L. (2023). Optimalisasi Sistem Informasi Personel dengan Menggunakan Internet of Things dalam Rangka Mendukung Tugas TNI AL. SATIN-Sains dan Teknologi Informasi, 9(1), 93-106.

Triandini, E., Jayanatha, S., Indrawan, A., Putra, G. W., & Iswara, B. (2019). Metode systematic literature review untuk identifikasi platform dan metode pengembangan sistem informasi di Indonesia. Indonesian Journal of Information Systems, 1(2), 63-77.

Turyadi, I. U. (2021). Analisa Dukungan Internet of Things (IoT) terhadap Peran Intelejen dalam Pengamanan Daerah Maritim Indonesia Wilayah Timur. Jurnal Teknologi dan Manajemen Informatika, 7(1), 29-39.

Yang, S. L. (2016). Corporate social responsibility and an enterprise's operational efficiency: considering competitor's strategies and the perspectives of long-term engagement. Quality & Quantity, 50(6), 2553-2569.

Yudistriansyah, A., Suryanegara, M., Gunawan, D., Arifin, A., & Krisnadi, I. (2019). Evaluasi Maturity Level Keamanan dan Rekomendasi Perbaikan Keamanan Internet of Things (IOT) PT XYZ Berdasarkan Kerangka Kerja IOT Security Maturity Model. Universitas Indonesia, 1-2.