Formosa Journal of Applied Sciences (FJAS)
Vol. 4, No. 7 2025: 2107-2124

Use of Artificial Intelligence Based Applications in Decision Making in Order to Win Modern Warfare

Yudi Pranata[1*], Yulianto Hadi[2], Andi Arman[3]
Universitas Pertahanan Republik Indonesia
Corresponding Author: Yudi Pranata tecra2006@gmail.com

A R T I C L E I N F O

Keywords: Artificial Intelligence, Decision Making, Modern Warfare, Technology Integration, Competitive Advantage

Received : 21, May
Revised : 23, June
Accepted: 25, July

A B S T R A C T

Artificial intelligence has great potential to revolutionize decision-making by providing fast and accurate data analysis, thus providing a significant competitive advantage in conflict situations. This research aims to analyze the use of artificial intelligence-based applications in military decision-making to win modern wars through a qualitative approach. The main focus of this research is to understand how artificial intelligence technologies are applied in the context of military strategy, as well as identifying the benefits and challenges that arise from the integration of these technologies. Data was collected through document analysis and case studies from various modern conflicts where artificial intelligence has played a significant role. The results show that artificial intelligence has great potential in speeding up the decision-making process, improving intelligence accuracy, and optimizing military resources.

DOI prefik: https://doi.org/10.55927/fjas.v4i7.239
ISSN-E: 2962-6447
https://srhformosapublisher.org/index.php/fjas

INTRODUCTION

War has undergone significant evolution throughout history, from physical combat with traditional weapons to modern warfare involving advanced technology. Before the use of artificial intelligence, war strategies relied heavily on human intuition, tactical experience, and manual analysis. Decision-making on the battlefield required a long process, with intelligence analysis limited to human ability to process information from various sources. In addition, the ability to predict and adapt to the dynamics of war was very limited because tactical decisions were made based on past data that was sometimes outdated when applied. The use of technologies such as radar, satellites, and electronic devices did provide advantages in intelligence and communication, but still required significant human intervention for strategy analysis and implementation. In the era of globalization and increasingly rapid technological development, the dynamics of modern warfare have undergone significant changes. One of the main factors influencing this change is the advancement of information and communication technology, which directly impacts the way the military makes decisions on the battlefield. Amidst these developments, artificial intelligence technology has emerged as one of the most promising innovations in supporting military strategy and tactics. Artificial intelligence has great potential to revolutionize decision-making by providing fast and accurate data analysis, thus providing a significant competitive advantage in conflict situations (Allen, 2018). The tradition of military decision-making that previously relied heavily on manual analysis, intuition, and the experience of commanders in the field is now facing new challenges. With the increasing complexity of data that must be processed in a short time, the use of artificial intelligence is becoming increasingly relevant (Aldoseri et al., 2023). Artificial intelligence can process large amounts of information from various sources in real-time, identify patterns that may not be detected by humans, and provide faster and more precise data-based recommendations (Li et al., 2022). This is especially important in the context of modern warfare where the speed and accuracy of information can determine victory or defeat. However, although the potential of artificial intelligence in military decision-making is enormous, its application is not without challenges. The main challenge is the increasing dependence on this technology, which can pose risks in the event of system failures or cyber attacks (Tse, 2022). In addition, decisions produced by artificial intelligence algorithms often contain bias, which can affect the fairness and ethics of decision-making (Alexandra Jonker, 2024). Another challenge that needs to be considered is the ethical issue in the use of artificial intelligence, especially related to the autonomy of machines in making decisions that can affect human lives (Rakowski et al., 2021).

The qualitative approach in this study was conducted to understand in depth how artificial intelligence is used in a military context, as well as to explore the benefits and challenges that arise from its use (Hadlington et al., 2024). Through document analysis and case study analysis using Robert K. Yin's modeling of various modern conflicts, this study seeks to provide a comprehensive picture of the role of artificial intelligence in warfare modern.

This study also seeks to identify various factors that influence the success of implementing artificial intelligence in military decision-making. One important factor is the readiness of military technology and infrastructure to integrate artificial intelligence into existing systems (Crosby, 2020). In addition, policies are needed that support the responsible use of artificial intelligence, taking into account the related ethical and legal aspects. The results of this study are expected to make a significant contribution to the understanding of the use of artificial intelligence in a military context, as well as provide recommendations for optimizing the use of this technology in modern warfare. Thus, this study is not only relevant to military policy makers, but also to technology developers and ethicists involved in the development and implementation of artificial intelligence. In facing the challenges that exist, this study emphasizes the importance of a holistic and thoughtful approach in implementing artificial intelligence on the battlefield. A deep understanding of the capabilities and limitations of artificial intelligence, as well as the development of a framework that can address the associated risks, are key to ensuring that this technology can be used effectively and responsibly. Modern warfare demands a fast and accurate response, and artificial intelligence offers a solution that can address the complexity and speed required in decision-making. However, without proper care, the use of artificial intelligence can carry unwanted risks (Dan Hendrycks, Mantas Mazeika, 2023). Thus, the integration of artificial intelligence in military decision-making is expected to bring great benefits to the success of military operations, while minimizing the risks associated with its use.

LITERATURE REVIEW

Intelligence artificial has become Wrong One technology Which most impact in various sectors, including the military. The use of artificial intelligence in the context of modern warfare offers the potential to accelerate and optimize the military decision-making process. Benjamin Scott and Andre Mitchell (2022) emphasize that artificial intelligence can process large amounts of data in real-time , allowing the military to make faster and more accurate decisions in complex and dynamic situations. The use of artificial intelligence in the military has transformed from being merely an analytical tool to an integral strategic component of military operations. Rolf Roth (2004) explains that decision-making military traditional very depends on intuition And experience commander, which is often time-consuming and prone to human error. With artificial intelligence, this process can be automated and optimized, allowing for faster and more precise responses to emerging threats. In addition That, intelligence artificial Also capable identify pattern And anomaly in data that

might be missed by human analysis, as explained by Guansong Pang (Pang et al., 2021).

Technology integration is the process of incorporating new technology into existing systems, processes, or products to improve efficiency, productivity, functionality. Integration This covers various aspect, start from device hard such as machines and electronic devices, to software such as applications, management systems data, And tool communication. Objective main from integration technology is to maximize the benefits of technological advancements by ensuring that various technological components work together synergistically. A real-world example of technology integration is the use of the Internet of Things (IoT) in the manufacturing industry, where smart sensors are integrated into machines to monitor performance in real time , reduce downtime , and improve operational efficiency. Technology integration is also important in education, where digital devices such as tablets and learning software are used to improve interaction and accessibility of information for students. The main challenges in technology integration often involve issues of compatibility, cost, and the need for retraining of human resources to operate these new systems. Technology integration is also useful for strengthening the rationality of improving the quality of military decision-making.

Theory Retrieval Decision

In the context of decision-making theory (Data-Driven Decision Theory, Rational decision-Making Theory, Command and Control Theory, and OODA Loop Theory), the Data-Driven Decision Theory proposed by Herbert A. Simon in 1977 provides an important framework for understanding how artificial intelligence can improve the quality of military decisions by making optimal use of data. This theory emphasizes the importance of information based data in rational and effective decision making, especially in a dynamic battlefield. artificial intelligence is able to process large amounts of data and provide insights faster and more accurately than human capabilities, thereby accelerating the decision-making process in an environment full of uncertainty. In addition, Rational Decision-Making Theory is also relevant in this context, because artificial intelligence helps reduce uncertainty in decision making by providing objective and comprehensive data-based analysis. In military operations, rational decisions can be achieved more effectively when artificial intelligence is used For filter information, evaluate various scenario, And providing optimal action suggestions based on real-time data . The Command and Control (C2) theory , which is the foundation of the military structure, also gains a new dimension with the integration of artificial intelligence. With artificial intelligence, command and control becomes more responsive and adaptive in facing the complexities of the modern battlefield. This technology enables military commanders to manage troops and resources more efficiently through an integrated information network. In the context of the OODA Loop (Observe, Orient, Decide, Act) , artificial intelligence provides significant advantages. in every stage cycle. On stage Observe , intelligence artificial can process data sensor in scale big And speed tall For get description battlefield in a way real

time. On stage Orient , intelligence artificial help compile complex data patterns and provide in-depth situational analysis. At the Decide stage , the AI system is able to provide recommendations based on various scenarios that generated from predictive algorithms. Finally, at the Act stage , artificial intelligence can be implemented through autonomous systems that accelerate military response in the field, either through automated weapons systems or more precise tactical maneuvers. With the integration of decision-making theories such as Data-Driven Decision Theory , Rational Decision-Making Theory , Command and Control Theory , and OODA Loop , artificial intelligence brings significant transformation in military operations, reducing uncertainty and increasing the effectiveness of strategies on the battlefield.

Theory Defense Cyber

However, despite its great potential, the use of artificial intelligence in the military is not without challenges. Malajati and Tolah (2024) point out that excessive reliance on artificial intelligence can pose significant risks, especially If happen failure system or attack cyber, Which relevant with Cyber Defense Theory . Alexander (2022) warns of algorithmic bias in artificial intelligence systems, which could affect the fairness and accuracy of military decisions. This bias can arise from the data used to train artificial intelligence algorithms, which may not be fully representative or contain certain biases.

Theory Simulation and Adaptation

Besides That, in complex environmental context, Theory Simulation and Adaptation (Simulation and Learning Theory and Adaptation and Response in Complex Environment Theory) become important, Because intelligence artificial must capable Study And continuously adapting to dynamic and unpredictable situations. Ethical aspects are also a major concern in the use of artificial intelligence for military decisions. Forrest E. Morgan et. al (2020) stated that although artificial intelligence can increase efficiency military operations, decisions decisions taken by machines can raise ethical dilemmas, especially when those decisions directly impact human lives. The issue of machine autonomy and moral responsibility on decision Which produced by intelligence artificial become Topic discussion which is important in this context.

Theory War Asymmetric

In the context of applying artificial intelligence, Peter Layton (2021) emphasizes the importance of a qualitative approach to understanding how these technologies can be integrated in a way effective in system military Which There is. Study qualitative This very important especially in asymmetric warfare , where the military power more small often use tactics No conventional For oppose great power. Use intelligence artificial in war asymmetric allow party which are more weak For to balance strength enemy with use technology for more sophisticated data analysis, reconnaissance, and tactical strategies, but Layton emphasized that a qualitative understanding of how artificial intelligence operates in these situations is critical because many of its dynamic aspects cannot be measured quantitatively alone.

Theory War Hybrid

In the context of Hybrid Warfare , where military operations combine conventional and asymmetric tactics, artificial intelligence can play a role in managing the complexity of this strategy. However, as Ralph D. Tiele (2020) argues, adequate technological infrastructure and clear policies are needed to mitigate the risks of using artificial intelligence, especially in hybrid warfare situations. Which need response fast And adaptive to tactics guerrilla, war cyber, and operation information Which often time No unexpected. Intelligence artificial Also provides significant advantages in enhancing situational awareness in asymmetric and hybrid battlefields by processing information in real-time , but challenges such as infrastructure limitations or unclear policies can still hinder its effectiveness. Therefore, technological readiness and supporting policies are key to the success of AI integration, both in the context of asymmetric and hybrid warfare.

In general overall, review library This show that temporary artificial intelligence offers opportunity big For increase taking decision military, its implementation requires a careful and responsible approach. A thorough understanding of the capabilities, risks, and ethical challenges associated with the use of AI is essential to ensure that this technology can be used effectively in winning modern warfare.

METHODOLOGY

This study uses a qualitative approach with a case study analysis of Robert K. Yin's modeling. to analyze the use of artificial intelligence-based applications in military decision-making, with a focus on how this technology can be applied to win modern warfare. A qualitative approach was chosen because it allows for in-depth exploration of complex and dynamic phenomena, which are difficult to measure through quantitative methods. This method also allows researchers to gain a more holistic understanding of the context And process Which involved in use of intelligence artificial in field military.

1. Qualitative Methods.
   The qualitative research methods used in this study allow exploration deep to How intelligence artificial applied in military decision making.
2. Case study.
   This study uses a case study analysis by Robert K. Yin to examine the implementation of artificial intelligence in military decision making in various conflict modern. Analysis studies case by Robert K. Yin chosen Because This design allows for in-depth and detailed analysis of relevant specific examples (Yin, 2013). Through this case study analysis, this research can explore how AI applied in situation real And How technology This influence the outcome of decisions taken. Several case studies are taken from well-documented conflicts, where artificial intelligence has played a significant role in military strategy.

3. Data analysis.
   The data in this study were collected through document analysis. The researcher also involved analysis of various documents, including official military reports, academic publications, and relevant articles and case studies.

These documents provide secondary data that enrich the researcher's understanding of How intelligence artificial has applied in context military And the results achieved. These documents were analyzed using a content analysis approach to identify key themes and trends in the use of artificial intelligence. The data collected were analyzed using a thematic analysis approach, which allows researchers to identify patterns, themes, and key concepts that emerge from the data. By conducting document analysis, This research provides an understanding Which comprehensive about role intelligence artificial in winning modern warfare, and the challenges and opportunities that arise from its use. The approach This expected can produce findings Which relevant And beneficial for the development of future military policies and strategies.

RESEARCH RESULT AND DISCUSSION

Processing Data and Analysis Fast

One of the main advantages of artificial intelligence is its ability to process large amounts of data at a speed and accuracy that humans cannot achieve. In the military context, this means that artificial intelligence can be used to collect and analyze data from multiple sources, such as visual intelligence, communications, and sensors, to create a more comprehensive situational picture. Scott and Mitchell (2022) emphasize that artificial intelligence can be used to process raw data into actionable information. with fast, so that allow commander military for make more timely and targeted decisions. AI has proven its ability to process and analyze large amounts of data with speed and accuracy that exceeds human capabilities. This is especially relevant in the context of military, in where speed and accuracy taking decision can be a factor determinant in mission or operation. Besides Which put forward by Scott and Mitchell, other researchers such as Dan G. Cox (2021) also highlight the role of artificial intelligence in filtering and integrating data from various sources such as satellite imagery, radio communications, and other battlefield information, to build a situational picture. Which completer and more accurate. More carry on, they emphasize that artificial intelligence not only speeds up the decision-making process but also improves quality decision with give analysis predictive based on historical data and current trends. This is supported by Crosby (2020), who stated that the use of artificial intelligence in military data analysis allows the identification of patterns that might be missed by human analysts, thereby strengthening the predictive and responsive capabilities of military commands in dynamic situations. Therefore, the integration of artificial intelligence in data processing in the military environment not only speeds up response time but also enriches the quality of analysis, which ultimately increases operational effectiveness in the field.

Development Model Simulation and Predictive

Artificial intelligence can also be used in the development of simulation models that allow the military to test various warfare scenarios without real risk. Model This can simulate behavior enemy, predict results from various tactics, and evaluate the effectiveness of various strategic options. Modeling and simulation (M&S) supported by artificial intelligence technology enables a deeper understanding of the operational environment and helps in better planning of military operations. By using artificial intelligence-powered simulations, the military can prepare for a range of contingencies and respond more flexibly to unexpected situations. Artificial intelligence has opened up new opportunities in the development of military simulation models that allow testing of various war scenarios without incurring real risks. Research by Michael Ownby and Alexander Kolt (2016) shows that artificial intelligence technology in Modeling and Simulation (M&S) not only allows simulation behavior enemy in a way realistic, but also can anticipate and predict their responses to the various strategies implemented. This provides superiority strategic in to design tactics and the operation that more effective. In addition, according to research by Claudio Novelli et. al. (2024), AI-based simulations enable mapping of potential risks and assessing the effectiveness of various strategic options in dynamic and complex environments. They note that by using AI-powered simulations, the military can not only plan faster and more flexible responses, but can also identify weaknesses in strategies that may not be apparent through conventional analysis. These simulations provide military commanders with the ability to explore "what-if" scenarios in depth, thereby enriching their understanding of environment operational and increase readiness in face various unexpected situations.

Improvement Collaboration Man- Intelligence Artificial

To effectively integrate artificial intelligence, it is important to ensure that AI serves as an aid to human decision-makers, not as a replacement. Diego L. (2022) highlights the importance of collaboration between humans and artificial intelligence, where artificial intelligence helps speed up the decision-making process while humans retain full control over the decisions. end. This need training Which intensive for personnel military for understand method Work intelligence artificial and how utilise output artificial intelligence in a way optimal in taking decision. Integration intelligence artificial in taking decision military demand balance Which Be careful between automation and control man. As put forward by Diego L., intelligence artificial should serve as a tool that accelerates the decision-making process, while humans remain responsible for the final decision. Another study by Valerie Chen et al. (2023) supports this view, emphasizing that artificial intelligence can improve the efficiency and accuracy of data analysis, but that decisions left entirely to artificial intelligence risk ignoring intuitive and ethical factors that only humans can consider. They suggest that effective collaboration between humans and artificial intelligence requires the development of a framework in which artificial intelligence acts as an analytical assistant that processes complex information into interpretable insights. by man. Besides That, according to Adam Zee (2023), training intensive

training for military personnel to understand and optimally utilize artificial intelligence is essential. They emphasize the importance of continuing education that focuses on how to understand the limitations of artificial intelligence, interpret artificial intelligence output wisely, and maintain decision-making skills. decision traditional in era digital. Integration intelligence artificial Which success does not only depend on the technology itself, but also on readiness and ability man For Work The same with intelligence artificial in strategic decision making.

Readiness Organization and Technology Infrastructure

Effective implementation of AI also depends on the readiness of military technology and infrastructure. The necessary infrastructure includes secure and fast communication systems, and access to reliable and relevant data. In addition, organizational readiness is needed in terms of policies and procedures that support the effective and ethical use of AI. Without this readiness, the potential of AI may not be fully realized and could actually create new risks in military operations. Effective implementation of artificial intelligence in context military very depends on readiness technology and adequate infrastructure. Lindsay Sheppard (2020) emphasizes that robust infrastructure, including secure and fast communication systems, and access to reliable and relevant data, are prerequisites for maximizing the potential of AI in military operations. In addition, Matti M. et al. (2022) highlight the importance of organizational policies and procedures that support the effective and ethical use of AI. They note that without clear policies, the risk of misuse of AI or poor decision-making can increase, which can actually hinder the success of military operations. This is reinforced by Benjamin Jensen and Kathleen McInnis (2024), who point out that technological readiness alone is not enough; there must be close integration between AI and the military command structure. They argue that the failure to align AI technology artificial with policy organization can create gap operational and risks new, like dependence excessive on intelligence artificial without understanding full of its limitations. Therefore, technological and infrastructure readiness, supported by mature organizational policies and appropriate operational procedures, is essential to ensure that artificial intelligence can be implemented effectively and safely in a military context.

Understanding Risk and Ethics

Although artificial intelligence offers many benefits, the integration of artificial intelligence in taking decision military Also bring challenge, especially related to risks and ethical issues. Excessive reliance on artificial intelligence can weaken quality leadership military, especially If happen system failure or algorithm error. In addition, decisions made by artificial intelligence may contain bias, which can affect the fairness and accuracy of military decisions. Therefore, it is important to develop a strict ethical framework in the application of artificial intelligence in the military field. Although artificial intelligence offers a number of significant benefits in military decision-making, its integration Also bring challenge Serious, especially related with risk and ethical issues. Jacob Simpson et a. (2021) has highlight potential dependence Which overuse of artificial

intelligence can reduce the quality of military leadership, especially in the event of system failures or algorithmic errors. This can have an impact fatal in situation critical in were decision fast and appropriate very necessary. In addition, potential biases in AI algorithms could affect the fairness and accuracy of military decisions, which could ultimately harm the mission or even lead to unintended humanitarian consequences. Other researchers such as Avi Goldfarb and Jon A. Lindsay (2022) also warn that while AI can speed up the decision-making process, there is a risk that military leaders may rely too heavily on AI, potentially ignoring intuitive judgment and human experience that are often essential in complex situations. They suggest that to minimize this risk, it is essential to develop a rigorous ethical framework governing the use of AI. in context military, including ensure existence transparency in AI algorithms and the implementation of mitigation measures against potential bias. Furthermore, according to the Deputy Secretary of Defense (2021) in his memorandum to the leadership at the Pentagon, he stated that education and training ethics Which strong for personnel military related to intelligence artificial Also become crucial for ensure that technology This used in a responsible and humane manner.

Dependence Excessive on Intelligence Artificial

One of the biggest challenges in using artificial intelligence in the military is the risk of over-reliance on the technology. this. When critical decisions handed over to artificial intelligence systems, there is a danger that military leaders may begin to lose their expertise and intuition in decision making. Babos shows that over-reliance on artificial intelligence can undermine leadership capabilities, especially in situations where artificial intelligence systems fail or are attacked, leaving human decision-makers without the technological support they rely on. Therefore, it is important to maintain a balance between the use of artificial intelligence as a tool and reliance on human judgment. Other researchers, such as OC Ferrel et al. (2024), warn that this could lead to rigid and less adaptive decision-making, as artificial intelligence tends to operate based on historical patterns and data, which may not always be relevant in dynamic and unpredictable situations. In addition, research by Saar Alon-Barkat (2021) shows that relying on intelligence artificial way excessive can erode trust self-leaders in making independent decisions, which can ultimately undermine the quality of leadership and overall operational effectiveness. They suggest importance development program training Which No only focus on the use of artificial intelligence, but also on maintaining and improving human decision-making skills. Thus, maintaining a balance between the use of artificial intelligence as a tool and reliability in evaluation man is key for ensure that technology This support, not replace, the role of military leaders.

Risk Security and Vulnerability Cyber

Intelligence made in context military face challenge significant related to security, especially regarding vulnerability to cyber-attacks. Artificial intelligence systems used in military operations rely heavily on reliable data and secure communication networks. If this data is compromised or the network is hacked, then the AI output can be inaccurate or even manipulated to mislead operational decisions. crucial. The Cybersecurity and Infrastructure Security Agency (CISA, 2024) highlights that data security and system integrity are key components to ensuring artificial intelligence functions properly in a cyber environment. military Which very sensitive. Besides That, according to study Which done by Paul Theron and Alexander Kolt (2019), cyberattacks targeted at artificial intelligence systems can have devastating effects, such as taking control, spreading false information, or even causing total system failure, all of which can seriously disrupt military operations. They also point out that artificial intelligence itself can be used by attackers to identify and exploit system vulnerabilities, making cyber threats even more complex and difficult detected. In context This, development system defense cybers Which strong and adaptive is must for support use of artificial intelligence in the military. They stressed the need for a layered approach to cybersecurity, including advanced encryption, real-time network monitoring, and rapid response to threats, to protect the integrity and reliability of military AI systems.

Problem Ethics and Bias Algorithmic

One of the significant challenges in the application of AI in the military is the issue of ethics and algorithmic bias, which is often overlooked. AI is designed and trained using historical data, which may contain inherent biases from the humans who created or provided the data. These biases can cause decisions made by AI to be unfair or unethical, especially in the military context, where every decision can have serious consequences. to human life. The importance of a strict ethical framework in the use of artificial intelligence is to ensure that the decisions taken by these systems remain fair and in accordance with human values. In addition, research by Emilio Ferarra (2023) shows that bias in artificial intelligence can exacerbate existing inequalities, for example by disproportionately affecting certain groups or reinforcing existing stereotypes. They propose that in addition to strict oversight, there should also be transparency in the development and application of AI algorithms, so that potential bias can be identified and overcome since beginning. Ron Chrisley (Chrisley, 2020) underlining the importance of principle " intelligence artificial Which focus on man" Which placing human welfare and dignity as the top priority in every decision-making process carried out by artificial intelligence. They emphasize that without proper ethical intervention, artificial intelligence in the military could potentially produce decisions that No just bias but also violates right human rights. Therefore, a holistic approach is needed that not only addresses the problem technical but also consider implications ethical from use artificial intelligence in military operations.

Disturbance In Dynamics Leadership and Communication.

The use of AI in the military could also disrupt the dynamics of leadership and communication between commanders and their troops. With the increasing use of AI for decision-making, there is a risk that interpersonal relationships and trust between leaders and subordinates could be disrupted. According to Paul Lushenko (2024), trust is component important in operational effectiveness, and if trust in AI trumps trust in human leaders, this can lead to dysfunction in military units. It is important to maintain a balance between the use of artificial intelligence and human communication to maintain team cohesion and effectiveness.

Compliance to Standard Ethics and Law

Ethics and law play a critical role in the application of AI in the military. The implementation of AI must adhere to strict ethical standards to prevent abuse and to ensure that decisions made by AI systems do not violate human rights or international law. Compliance with these ethical and legal standards is essential to maintaining the legitimacy and accountability of the military in its use of advanced technologies such as AI. In addition, AI systems must be designed to be transparent and auditable, so that every decision made can be traced back and evaluated according to applicable legal norms.

Collaboration And Integration Between Institution

Factor final Which influence success implementation intelligence artificial intelligence in military strategy is collaboration and integration between agencies. The use of artificial intelligence in the military often involves multiple parties, including governments, technology companies, and international institutions. Close cooperation between all of these stakeholders is necessary to ensure that artificial intelligence is applied in a coherent and integrated manner across the spectrum of military operations. This also includes sharing information and best practices between allied nations to enhance collective capabilities in the face of common threats.

Development Policy Ethical And Regulation Which Strong

One of the first steps in implementing a holistic approach is the development of strong ethical and regulatory policies governing the use of artificial intelligence in the military. These policies should be designed to ensure that artificial intelligence is used in a manner that is consistent with the principles of international law and human rights. A strong regulatory framework is needed to prevent abuse technology intelligence artificial And For guard accountability in AI-enabled decision-making. The policy should also include guidelines on transparency, auditability, and responsibility in the use of AI, ensuring that any actions taken are traceable and evaluable.

Training And Education Which Sustainable

It is important to provide ongoing training and education to military personnel on the use of artificial intelligence. This training should include not only the technical aspects of artificial intelligence, but also an understanding of the risks and limitations technology This. Personnel military must train For Work in a way effectively with artificial intelligence and to know when to rely on artificial intelligence and when to use their own human judgment. Training This Also must emphasize importance maintain control man on final decisions, especially in complex and high-risk situations.

Strengthening Security Cyber and Integrity Data

Cybersecurity is a critical component of a holistic approach to managing AI risks in modern warfare. AI systems are highly vulnerable to cyberattacks, which can compromise data integrity or even take transfer control system. By Because That, important for develop a strong cyber defense system and ensure that data used by artificial intelligence is safe from manipulation. Strengthening cyber infrastructure should be a top priority to ensure that artificial intelligence can operate safely and effectively in a military context. In addition, the integrity of data used by artificial intelligence artificial must guarded with Good For prevent error or bias in decision making.

Supervision And Evaluation Which Continously

A holistic approach also requires ongoing monitoring and evaluation mechanisms to ensure that the use of artificial intelligence in the military remains in line with its intended purpose and does not pose unforeseen risks. The importance of ongoing evaluation of artificial intelligence systems to ensure that they function properly and do not pose harm to their users or targets. This oversight should also include assessing the social and ethical impacts of the use of artificial intelligence, ensuring that these technologies are used in a responsible manner and do not violate international norms.

Collaboration International and Exchange Information

Finally, international collaboration and information exchange are essential parts of a holistic approach. Countries should work together to develop international standards for the use of AI in the military and to share best practices in managing the risks associated with the technology. This importance collaboration between countries allies for strengthen collective capabilities in confronting common threats and to ensure that artificial intelligence is used coherently and effectively across the spectrum of military operations.

Operation Targeting Air Which Appropriate In Syria

In conflict Syria, coalition international use AI For increasing the precision of airstrikes against ISIS targets. Artificial intelligence is used to process intelligence data collected from various sources, including drone footage, human intelligence reports (HUMINT), and signals data (SIGINT). In accordance with the Rational Decision -Making Theory which was coined by March & Simon on year 1958 And theory System Command and the Command-and-Control System Theory (Command and Control System Theory) proposed by Cebrowski & Gartska (1998) states that with artificial intelligence, the military can identify targets. with accuracy higher and reduces the possibility of additional damage. artificial intelligence allows the targeting system to analyze data in seconds, compare it to intelligence databases, and provide recommendations to pilot or drone operator. Matter This No only increase effectiveness attacks but also minimize the risk of civilian casualties as collateral damage that triggers an international reaction.

Use AI in Management Medan War Cyber in Ukraine

In the ongoing conflict in Ukraine, both the Ukrainian and Russian sides have use intelligence artificial for manage and respond cyber threats. Artificial intelligence is used to detect cyber-attacks in real-time, identify their sources, and respond quickly to threats to protect critical military infrastructure. Based on Cyber Defense Theory Which initiated by Bruce Schneier (2000) so intelligence artificial enables faster response to cyber-attacks by analyzing network traffic patterns and detect anomaly Which show existence attack. With With the help of artificial intelligence, the military can automate many aspects of cyber defense, allowing them to stay alert to increasingly complex and sophisticated attacks, as well as ensuring that military communications systems remain secure and operational.

Simulation And Training Based on AI in NATO

NATO has been using artificial intelligence in training simulations to prepare military forces for modern combat scenarios. The simulations use artificial intelligence to create realistic environments in which troops can practice various tactics and strategy, as well as test response them to unexpected scenarios. In accordance with the Simulation and Learning Theory proposed by David Kolb (1994) and the Adaptation and Response in Complex Environment Theory proposed by John H. Holland (1995), the use of artificial intelligence in simulations allows the creation of highly realistic combat scenarios, where artificial intelligence can act as an enemy that adapts to troop tactics. This helps improve decision-making skills on the battlefield and ensures that troops are prepared for a variety of real-world situations. Simulations also allow for more in-depth post-exercise analysis, where troop performance can be evaluated and improved based on the results of the exercise.

Interpretation Results

The analysis shows that while artificial intelligence is capable of increasing the efficiency and speed of military operations, its successful implementation is highly dependent on comprehensive organizational readiness, adequate personnel training, and mature and wise policies. Organizational readiness includes secure infrastructure and fast and reliable communication systems, which are capable of supporting the full integration of artificial intelligence. Personnel training involves not only a technical understanding of how algorithms and processing work data, but Also ability for interpret results artificial intelligence and combining it with human intuition. This is important to ensure that military decision makers still have the ability to assess the situation accurately. critical and maintain human control on results end. On the other hand, clear and mature policies, including regulations governing the use of artificial intelligence, are needed to mitigate the risk of over-reliance and avoid potential algorithmic bias that can affect the fairness and accuracy of decisions. These policies should include ethical principles, transparency, auditability, and strict cybersecurity protocols. With an approach that involves multidimensional readiness, artificial intelligence can be utilized in a way optimal for strengthen ability strategic military, while ensuring that the technology does not replace critical aspects of human judgment and avoiding unintended negative impacts.

The Yin method used in these cases emphasizes the importance of a holistic approach. holistic, show that intelligence artificial functioning optimal in enhancing military response only if supported by adequate infrastructure, policies, and ethical understanding. The study concludes that, while artificial intelligence can significantly enhance military advantage, a multidimensional approach is needed to minimize risks and ensure safe and responsible integration.

CONCLUSIONS AND RECOMMENDATIONS

That technology intelligence artificial This if integrated on A application in military decision making has great potential to increase speed, accuracy, And effectiveness operational in war modern Which increasingly complex. artificial intelligence enables data processing and situational analysis that more deep, help commander military in planning strategic through realistic and predictive scenario simulations. However, collaboration between humans and intelligence artificial still essential, in where intelligence artificial play a role as tool aids that support decisions, while the final control remains in the hands of humans.

The success of AI integration depends on adequate technological and infrastructure readiness, personnel training, and policies and regulations that support the safe and ethical use of AI. Key challenges such as over-reliance, cybersecurity threats, and algorithmic bias must be anticipated. through strengthening security cyber, policy ethical, as well as training sustainable. Collaboration international Also required for develop standard of use intelligence artificial in military and ensure response integrated against threats. With a holistic approach, artificial intelligence can be utilized effectively and responsible answer, give superiority strategic Which significant while minimizing the associated risks.

ADVANCED RESEARCH

Further research on the use of artificial intelligence (AI)-based applications in military decision-making needs to focus on the integration of AI systems in Command and Control (C2), intelligence analysis, and real-time operational planning. In-depth studies can be directed at the application of machine learning to detect enemy patterns, predict maneuvers, and provide tactical decision options automatically. This study is also important to explore the use of AI-based decision support systems (DSS) in multi-domain battlefield data management (land, sea, air, cyber, and space), in order to accelerate the OODA (Observe–Orient–Decide–Act) cycle. In addition, it is necessary to study the AI integration model with autonomous weapons systems, including aspects of ethics and legality of use. The development of predictive algorithms based on historical data and the latest intelligence is expected to create information superiority in modern warfare. Strategic collaboration between the TNI, the National Cyber and Crypto Agency (BSSN), the Ministry of Defense, and research and technology institutions needs to be strengthened in order to create a sovereign defense AI ecosystem. This research is expected to be the basis for faster, more accurate, and more adaptive military decision-making to threat dynamics, while strengthening national defense capabilities in the era of information and technology-based warfare.

REFERENCES

Aldoseri, A., Al-Khalifa, K.N., & Hamouda, A.M. (2023). Re-Thinking Data Strategy and Integration for Artificial Intelligence: Concepts, Opportunities, and Challenges. In Applied Sciences (Switzerland) (Vol. 13, Issue 12). https://doi.org/10.3390/app13127082.

Alexander, P. (2022). Exploring Bias and Accountability in Military Artificial Intelligence. LSE Law Review, 7(3). https://doi.org/10.61315/lselr.323.

Alexandra Jonker, J.R. (2024). What is algorithmic bias? IBM. https://www.ibm.com/id- id/think/topics/algorithmic-bias.

Allen, D.M.W. and J.R. (2018). How artificial intelligence is transforming the world.

Benjamin Jensen, Kathleen McInnis, and JMMI (2024). Using Artificial Intelligence to Rethink the Unified Command Plan.

Chaplain (Maj.) Marlon W. Brown, USA (2020). Developing Readiness to Trust Artificial Intelligence within Warfighting Teams. Army University Press. https://www.armyupress.army.mil/Journals/Military-Review/English-Edition- Archives/January-February-2020/Brown-AI-ready.

Chrisley, R. (2020). A Human-Centered Approach to AI Ethics. In The Oxford Handbook of Ethics of AI.

CISA. (2024). Joint Guidance on Deploying AI Systems Securely. CISA. https://www.cisa.gov/news-events/alerts/2024/04/15/joint-guidance-deploying-ai-systems-securely.

Cox, D. G. (2021). Artificial Intelligence and Multi-Domain Operations: A Whole-of-Nation Approach Key to Success. Military Review, 101(May-June2021).

Crosby, C. (2020). Operationalizing Artificial Intelligence for Algorithmic Warfare. Military Review, 100(4).

Ferrara, E. (2023). Fairness And Bias in Artificial Intelligence: A Brief Survey of Sources, Impacts, And Mitigation Strategies.

Forrest E. Morgan, Benjamin Boudreaux, Andrew J. Lohn, Mark Ashby, Christian Curriden, Kelly Klima, D.G. (2020). Military Applications of Artificial Intelligence. In RAND. https://www.rand.org/pubs/research_reports/RR3139- 1.html.

Goldfarb, A., & Lindsay, J.R. (2022). Prediction and Judgment Prediction and Judgment: Why Artificial Intelligence Increases the Importance of Humans in War.

Hendrycks, Mantas Mazeika, TW (2023). An Overview of Catastrophic AI Risks.

Human-AI Collaboration in Decision-Making: Beyond Learning to Defer. https://doi.org/https://doi.org/10.48550/arXiv.2206.13202.

International Security, 46(3). https://doi.org/10.1162/isec_a_00425 Hadlington, L., Karanika-Murray, M., Slater, J., Binder, J., Gardner, S., & Knight, S. (2024). Public perception of the use of artificial intelligence in Defense: a qualitative exploration. AI and Society.

Layton, P. (2021). Fighting Artificial Intelligence Battles Operational Concepts for Future AI- Fighting Artificial Intelligence Battles Operational Concepts for Future AI- Enabled Wars. Network, September.

Li, J., Ye, Z., & Zhang, C. (2022). Study on the interaction between big data and artificial intelligence. Systems Research and Behavioral Science, 39(3). https://doi.org/10.1002/sres.2878.

Malatji, M., & Tolah, A. (2024). Artificial intelligence (AI) cybersecurity dimensions: a comprehensive framework for understanding adversarial and offensive AI. AI and Ethics. https://doi.org/10.1007/s43681-024-00427-4.

Matti Mäntymäki, Matti Minkkinen, Teemu Birkstedt, MV (2022). Putting AI Ethics into Practice: The Hourglass Model of Organizational AI Governance. https://doi.org/https://doi.org/10.48550/arXiv.2206.00335.

Memorandum For Senior Pentagon Leadership Commander sof the combatant commands Defense Agency And Dod Field Activity Directors (2021).

Michael Ownby, A. K. (2016). Predicting Enemy's Actions Improves Commander Decision-Making. InCornell University.

Novelli, C., Casolari, F., Rotolo, A., Taddeo, M., & Floridi, L. (2024). AI Risk Assessment: A Scenario-Based, Proportional Methodology for the AI Act. Digital Society, 3(1). https://doi.org/10.1007/s44206-024-00095-1.

O.C. Ferrell, Dana E. Harrison, Linda K. Ferrell, H.A. & BWH (2024). A theoretical framework to guide AI ethical decision making. Springer Nature Link, 14(1), 53–67. https://doi.org/https://doi.org/10.1007/s13162-024-00275-9.

Pang, G., Shen, C., Cao, L., & Hengel, A. Van Den. (2021). Deep Learning for Anomaly Detection: A Review. In ACM Computing Surveys (Vol. 54, Issue 2). https://doi.org/10.1145/3439950.

Paul Lushenko. (2024). Trust but verify: US troops, artificial intelligence, and an uneasy partnership. Brookings.

Paul Théron, A. K. (2019). When Autonomous Intelligent Goodware will Fight Autonomous Intelligent Malware: A Possible Future of Cyber Defense. Cornell University.

Rakowski, R., Polak, P., & Kowalikova, P. (2021). Ethical Aspects of the Impact of AI: the Status of Humans in the Era of Artificial Intelligence. Society, 58(3). https://doi.org/10.1007/s12115-021-00586-8.

Roth, R.I. (2004). The Rational Analytical Approach to Decision-Making: An Adequate Strategy for Military Commanders? Connections, 3(2), 71–92. https://www.jstor.org/stable/26323035.

Saar Alon-Barkat, M.B. (2021). Human-AI Interactions in Public Sector Decision-Making: "Automation Bias" and "Selective Adherence" to Algorithmic Advice. Cornell University.

Scott, B., & Michell, A. (2022). Enhancing Situational Understanding through Integration of Artificial Intelligence in Tactical Headquarters.

Sheppard, L. (2020). Accelerating the Defense Department's AI Adoption. https://www.cfr.org/report/accelerating-defense-departments-ai-adoption.

Tiele, R. (2020). Artificial Intelligence – A key enabler of hybrid warfare.

Tse, D. (2022). Cybersecurity and Technology Risk in Virtual Banking.

Valerie Chen, Q. Vera Liao, Jennifer Wortman Vaughan, GB (2023). Understanding the Role of Human Intuition on Reliance in Human-AI Decision-Making with Explanations. InCornell University. https://doi.org/https://doi.org/10.48550/arXiv.2301.07255.

Yin, R. K. (2013). Case study research: Design and methods. Applied Social Research Methods Series, 18(2). https://doi.org/10.1097/00001610-199503000-00004.

Zewe, A. (2023, January). No Title. MIT News Office. https://news.mit.edu/2023/ai-training-program-us-air-force-0111.