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Artificial intelligence as a factor of change in the use of military forces⁴

SUMMARY

The relationship between science, technology, war, and military forces that manifests in multidimensional space represents a non-linear system. The tendency to create an orderly system from the non-linear is natural. It is desirable to make decisions with utter certainty, but in practice, this imposes risks on the framework of the military system's operational structure. Bearing in mind the uniqueness and potential of future applications, the question arises as to how the introduction of artificial intelligence will affect the change in the use of military forces. The problem defined in this paper is solved through the analysis and consideration of the multi-layered implications of artificial intelligence in the context of strategy and doctrine while following the necessary resources. The study is based on contemporary political and technological concepts, considers political, military, legal, and ethical perspectives, identifies opportunities, challenges, and open questions, and offers comprehensive observations. Assuming that artificial intelligence will manage to operationalize at least part of the postulate of autonomy in the near future, in light of rapid technological development, this paper provides insight and a pathway to advance further thinking, research, and policymaking for the proper integration, management, and use of artificial intelligence in the military.

Keywords: doctrine, military, artificial intelligence, resources, strategy, technology.

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Veštačka inteligencija kao faktor promene u upotrebi vojnih snaga

SAŽETAK

Odnos nauke, tehnologije, rata i vojnih snaga koji se manifestuje u višedimenzionalnom prostoru u osnovi predstavlja nelinearan sistem. Težnja ka stvaranju uređenog sistema od nelinearnog je prirodna. Donošenje odluka sa apsolutnom sigurnošću je idealno stanje, ali realnost nam nameće rizik kao okvir u kome funkcioniše vojni sistem. Imajući u vidu jedinstvenost i potencijal buduće primene, postavlja se pitanje kako će uvođenje veštačke inteligencije uticati na promenu upotrebe vojnih snaga. Problem koji je definisan u ovom radu sagledava se kroz analizu i razmatranje višeslojne implikacije veštačke inteligencije u kontekstu strategije i doktrine, uz praćenje neophodnih resursa. Studija se zasniva na savremenim političkim i tehnološkim konceptima, kao i na razmatranju političkih, vojnih, pravnih i etičkih perspektiva, identifikuje mogućnosti, izazove i otvorena pitanja i nudi sveobuhvatna zapažanja. Pod pretpostavkom da će veštačka inteligencija uspeti da operacionalizuje barem deo postulata autonomije u bliskoj budućnosti, u svetlu brzog tehnološkog razvoja, ovaj rad pruža uvid i put ka unapređenju daljeg razmišljanja, istraživanja i kreiranja politike za odgovarajuću integraciju, upravljanje i korišćenje veštačke inteligencije u vojsci.

Ključne reči: doktrina, vojska, veštačka inteligencija, resursi, strategija, tehnologija.

Introduction

“Any sufficiently advanced technology is equivalent to magic”.

Arthur Clarke

The potential of artificial intelligence (AI) in the security domain and military environment can be manifested in different application segments. From strategic deliberations through doctrinal arrangements and available resources, AI certainly deserves to be considered. The activities of many countries that actively adapt their strategic-doctrinal solutions and develop systems based on them support the previous claim. The fact that AI is recognised as a factor of change in the use of military forces is the basic thesis of this paper. It, therefore, deserves an adequate analysis and a clearer definition of its place and role in the strategy and doctrine of the use of military forces.

When we consider the doctrine of the use of military forces, the central place certainly belongs to the planning and execution of army operations, which are the basic elements of the implementation of activities, i.e., war. AI, with its potential, will surely gradually support and replace humans in task realisation because it becomes faster, more accurate, more efficient, and more

capable of processing even more information of increased complexity. This approach can lead to an increase in the dynamics of military operations and the optimisation of the decision-making process, which, in the end, can contribute to a positive outcome. Whether AI will lead to a revolution in the use of military forces certainly depends not only on technology but also on various other factors.⁴

Shifting the boundaries of warfare slowly but surely leads to a “multidimensional battle”, which in a practical sense represents the embodiment of a new scientific paradigm of military thinkers and carriers of doctrine development that is based on non-linearity.⁵ Non-linear fields of study are applicable to military science and practice because they are fundamentally imbued with complexity and chaos theory. In this context, AI can be applied in a number of different roles, like a sensor, a planning agent, a “soldier”, or a combination of both.⁶ On the other hand, AI can be applied to support systems for intelligence-reconnaissance functions, autonomous navigation, and target recognition systems.⁷ This can lead to different forms of interaction between military personnel and AI systems, and later to the delegation of some military tasks to AI systems. As an example of joint work in the decision-making process, we can cite unmanned piloted aircraft that operate autonomously with minimal human supervision and can perform joint tasks with manned systems. The technology is currently far from an autonomous system. It will probably be a long time before we have a human “in the loop” and “on the loop” to monitor and control the system.⁸ However, the extraordinary progress of AI development will, at some point, produce a system capable of independent reasoning similar to the human mind, or at least in some segments.

Military strategy and artificial intelligence

Looking for a common point of view on strategy and the use of military forces, perhaps it is best to refer to the thinking of Alexander Andreyevich Svechin (Александр Андреевич Свечин). In his work “Strategy”, he

⁴ Jean-Christophe Noël, “Will artificial intelligence revolutionize the art of war?”, *Politique étrangère*, Vol. 1, No. 4, 2018, 159-170, DOI: <https://doi.org/10.3917/pe.184.0159>.

⁵ *The US Army Multi-Domain operations 2028*, U.S. Army https://www.army.mil/article/243754/the_u_s_army_in_multi_domain_operations_2028, 11.11.2023.

⁶ William A. Branch, *Artificial Intelligence and Operational-Level Planning: An Emergent Convergence*, School of Advanced Military Studies, Fort Leavenworth, 2018, 25.

⁷ Vincent Boulanin, Lora Saalman, Petr Topychkanov, Fei Su & Moa Peldán Carlsson, *Artificial Intelligence, Strategic Stability and Nuclear Risk*, Stockholm International Peace Research Institute, Stockholm, 2020, 38.

⁸ Peter Layton, *Algorithmic warfare: Applying artificial intelligence to warfighting*, Air Power Development Centre, Canberra, 2018, 28-30.

explained that strategy is “the art of combining preparations for war with the grouping of operations to achieve the objective set by the armed forces. Strategy decides on issues related to the use of the armed forces and all resources of the country to achieve the ultimate war goals”.⁹ It could be simplified to say that military operations serve the political and strategic goals of the state. From the perspective of the highest military positions, the conflict can be divided into three levels: strategic, operational, and tactical. This process is what Scott Nicholas Romaniuk called the “orchestration of war” in his work “Military Strategy and the Three Levels of War”.¹⁰ In the context of the use of the military, it may be better to focus on military strategy. The military strategy provides the rationale for the need for military operations located at the junction of the political and military segments. It is a plan that connects the end goal with the means to achieve it. It can be defined as “the use of armed forces to achieve military objectives and the broader political purposes of war”.¹¹ The framework for the manifestation of military strategy is defined in the national security and defence strategy, and some countries implement it within the defence white paper. The analysis of the previously mentioned documents of the main global actors will be the methodological framework for defining the place and role of AI in military strategy and the impact on the changes of the military forces.

The use of AI in military strategy in the direction of changes in the use of military forces can be analytically understood through the strategic documents of the main actors on the international scene. Institutions of collective security and defence in the most developed countries in the world are the carriers of the development of all important activities, including technology such as AI. Considering the strategies in that context, the military character of the use of AI was mainly the subject of national strategies, i.e., the states independently defined the framework of use in accordance with their challenges and technological possibilities. There is no clear communication of how they use or intend to use AI as part of military strategy. Consequently, analysis of the effects of AI on military strategy and vice versa must, at this stage, rely on defence white papers and state strategies. In the broadest framework, at the time of writing this paper, 69 countries have officially announced initiatives, while 55 have adopted strategies that define further action and development. The strategies consider the use, development, and financing of projects, particularly in the health and transport sectors. It is important to note that they almost do not mention

⁹ Aleksandar A. Svečin, *Strategija*, VIZ, Beograd, 1956.

¹⁰ Scott Nicholas Romaniuk, *Military Strategy and the Three Levels of Warfare*, Defense Report, <https://defencereport.com/wp-content/uploads/2017/11/Romaniuk-Military-Strategy-and-the-Three-Levels-of-Warfare.pdf>, 11.11.2023.

¹¹ Elinor C. Sloan, *Modern Military Strategy: An Introduction*, Taylor & Francis, London, 2016, DOI: <https://doi.org/10.4324/9781315740034>.

the possibility of application in the military sphere.¹² The adoption of national strategies indicates that large and powerful countries have recognised the potential, understood the strategic importance in the military sphere of use, and directed their efforts to develop, acquire, and integrate AI systems into their armed forces. Only a few of the most developed countries have published AI development strategies in the field of security without significant data on projects and how to use them, which is most likely a consequence of the topic's sensitivity.

Understanding and analysing strategic initiatives in the field of security and defence is currently possible only through the analysis of a few key strategies that are publicly available. This paper will include an analysis of the strategies of NATO, the US, the People's Republic of China, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland, and the Republic of France.

The leading collective defence organisation, NATO, adopted the 2021 Strategy as a sign of support for the activities that the Alliance undertakes in its three basic tasks: collective defence, crisis management, and cooperative security. The principles of development are based on: legality, responsibility, consistency, reliability, manageability, and impartiality. The strategy should ensure the technological advantage and superiority of the Alliance through the achievement of the following goals:

- NATO and its allies, by their example, should encourage the development and use of AI responsibly with the aim of a common defence and security policy;
- Acceleration and prioritisation in the development of capabilities and the improvement of interoperability within the Alliance through new programme proposals;
- Protection of own technologies, ability to innovate, improvement of security policy, as well as operationalization of the principle of responsible use;
- To identify and protect against threats and misuse of AI by state and non-state actors.¹³

Besides focusing on AI, the strategy also creates the conditions for an ambitious plan by NATO and its allies regarding the actualization of other developing technologies. The future strategic advantage that comes with innovation will come from the connections between ethical leadership and

¹² *National AI policies & strategies*, OECD.AI, 2021, <https://oecd.ai/en/dashboards/overview>, 11.11.2023.

¹³ *Summary of the NATO Artificial Intelligence Strategy*, NATO, https://www.nato.int/cps/en/natohq/official_texts_187617.htm, 11.11.2023.

the adoption and integration of technologies that create flexibility, interoperability, and trust.¹⁴

The US Department of Defence outlined the main determinants of the Strategy in a document published in 2018.¹⁵ Analysing the document, one gets the impression that perhaps the US has best understood the possibilities of AI in the future changes of military forces. AI capabilities will be used to positively transform all defence functions, thereby supporting and protecting US military personnel, US citizens, defending allies and partners, and improving the affordability, efficiency, and speed of operations. The JAIC will play a central role in the implementation of this strategy, together with other entities responsible for the development of high technologies, as well as within partnerships with civil society organisations.¹⁶ The US National Security Commission issued a report in 2021 presenting a national defence strategy related to AI.¹⁷ The main goal is to set frameworks for the development of capabilities based on AI by 2025, which implies organisational reforms, the design of innovative warfare concepts, the definition of target performance, and digital readiness. In addition to the above, it is necessary to define an integrated national strategy for the reorganisation of the government, the reorientation of the nation, and the gathering of our closest allies and partners for defence and competition in the coming era of competition and conflict. They see the Russian Federation and the People's Republic of China as their biggest rivals in this field, which invest intensively in the use of AI in military applications.

The Defence White Paper, or "New Era of China's National Defence", issued in 2019, recognises modern technologies as one of the challenges of future warfare. In the part dedicated to the fact that global military competition is intensifying within the new round of the technological and industrial revolution, it was cited that it is taking on historical forms. The revolution is marked by the application of state-of-the-art technologies such as AI, quantum technologies, "Big data", "cloud computing", and "IoT-Internet of Things", which are areas that increasingly gain space in military applications. The trend of developing precise, intelligent, invisible, unmanned, and long-range weapons paves the way for future intelligent warfare.¹⁸

¹⁴ *An Artificial Intelligence Strategy for NATO*, NATO, <https://www.nato.int/docu/review/articles/2021/10/25/an-artificial-intelligence-strategy-for-nato/index.html>, 11.11.2023.

¹⁵ Summary of the 2018 Department of Defense Artificial Intelligence Strategy, *Department of Defense*, <https://media.defense.gov/2019/Feb/12/2002088963/-1/-1/1/SUMMARY-OF-DOD-AI-STRATEGY.PDF>, 11.11.2023.

¹⁶ JAIC - Joint Artificial Intelligence Center.

¹⁷ *Final Report*, National Security Commission on Artificial Intelligence, <https://reports.nscai.gov/final-report/>, 15.11.2023.

¹⁸ *China's National Defense in the New Era*, The State Council Information Office of the People's Republic of China, <https://chinaus-icas.org/wp-content/uploads/2019/09/Chinas-National-Defense-in-the-New-Era.pdf>, 10.12.2023.

In 2019, the Russian Federation published the “National Strategy for the Development of AI for the Period Until 2030”.¹⁹ Like most similar documents from other countries, the strategy defines the goals and main directions of the development of AI in the Russian Federation, as well as measures aimed at its use to secure national interests and implement strategic national priorities, including the areas of scientific and technological development. According to the article “Russia’s AI-Enabled Military Ecosystem and Its Algorithmic Warfare”, the Armed Forces of the Russian Federation have mastered the capabilities of using part of the capabilities of AI.²⁰ The armed forces have demonstrated the use of AI robotic weapons, autonomous tanks, drones, and long-range strikes involving high-precision missiles. According to them, Russia is committed to the use of AI for intelligence gathering, command and control, logistics, and the development of autonomous weapons. Similar thinking can be found in other public sources.²¹ The recognition of the Russian Federation as one of the most important rivals in this segment by the US certainly speaks in favour of the fact that the non-transparency of strategy development cannot be considered a priori as a functional deficiency but as one of the ways of conducting policy in the most important spheres related to national security. Despite having advanced military capabilities based on AI, the Russian Federation has not used any lethal autonomous weapon systems in conflicts so far.

European countries are at similar stages in terms of strategies. The Ministry of Defence of the United Kingdom has adopted the AI Defence Strategy 2022.²² The strategy specifies the dynamics and scope of the adoption and use of AI by the Ministry of Defence and the realisation of tasks through cooperation with the public sector and international cooperation in shaping the global development of AI. France has not adopted the strategy as a separate document. However, its 2019 report, “AI in Support of Defence”, is a comprehensive document that states that the French armed forces cannot stand aside from developments at the risk of missing a major technological milestone and losing the operational superiority they currently enjoy. Within the framework of the national strategy initiated by the President of the Republic, this document establishes the AI strategy of the

¹⁹“Указ Президента Российской Федерации от 10.10.2019 г. № 490 О развитии искусственного интеллекта в Российской Федерации”, Президент России, <http://www.kremlin.ru/acts/bank/44731>, 11.11.2023.

²⁰ *Russia’s AI Enabled Military Ecosystem and Its Algorithmic Warfare*, <https://www.idsa.in/id-sacommments/russias-ai-enabled-military-ecosystem-ssharma-160322#:~:text=1%20Russia%20is%20heavily%20committed,systems%20in%20the%20recent%20conflict>, 11.07.2023.

²¹ Samuel Bendett, *Russian Military Debates AI Development and Use*, Center for a New American Security, <https://www.cnas.org/publications/commentary/russian-military-debates-ai-development-and-use>; 10.12.2023.

²² *Defense artificial intelligence strategy*, UK Ministry of Defense, https://assets.publishing.service.gov.uk/media/62a7543ee90e070396c9f7d2/Defence_Artificial_Intelligence_Strategy.pdf, 15.12.2023.

Ministry of the Army. It represents an ambitious but pragmatic roadmap, in line with France's values, that will enable the entire ministry – the armed forces, the administration, and the support services – to benefit from the significant progress in this area. In particular, the strategic advantage of AI integration into the armed forces is highlighted in tasks such as the speed of analysis and decision-making, optimisation of logistics, and increased protection of soldiers. They highlight machine learning as a major field for research and development.²³

After summarising a brief analysis of the strategies of the most important world actors, it can be said that, as such, they do not give a clear picture of how AI will affect military strategy; the corresponding expectations can be based on indications of potential future use. Whether the military strategy will give AI some concrete tasks is difficult to consider from this position. The direct use and control of lethal weapons of strategic importance must not and will never come under the authority of a non-human system.²⁴ An area where AI can be useful in military strategy is in applications that can help decision-makers monitor the battlefield and develop different deployment scenarios. The AI development can be directed towards predicting the behaviour and reactions of other states or generating simulations of the progression of ongoing conflicts. On the other hand, it can be useful for assessing threats and risks, analysing them, and proposing courses of action, ultimately guiding decision-makers on the best response to be undertaken.²⁵ Aligning the capabilities and assets of the armed forces with the given political and strategic objectives can be the framework of the contribution of AI, which is the main function of military strategy. As such, the possession and use of AI become strategic tools and goals.

Doctrine and artificial intelligence

Defining the doctrine of the army in modern terms is an immense challenge because the modern use of military forces is an extremely dynamic field in constant change. The various factors of change in the use of military forces must be covered, considered, and defined in the doctrinal documents of a country; otherwise, they will not be recognised in the use of the military by decision-makers. The Republic of Serbia has defined the Doctrine of the

²³ *Artificial Intelligence in Support of Defense*, Ministry of Defense, <https://www.defense.gouv.fr/sites/default/files/aid/Report%20of%20the%20AI%20Task%20Force%20September%202019.pdf>, 16.12.2023.

²⁴ James Johnson, "The AI-cyber nexus: implications for military escalation, deterrence and strategic stability", *Journal of Cyber Policy*, Vol. 4, No. 3, 2019, 442–460, DOI: <https://doi.org/10.1080/23738871.2019.1701693>.

²⁵ Ashley Deeks, Noam Lubell & Daragh, "Machine Learning, Artificial Intelligence, and the Use of Force by States", *Journal of National Security Law & Policy*, Vol. 10, 2018.

Serbian Army as the highest doctrinal document that should provide answers to the question of how Serbia will use military force in response to contemporary challenges, risks, and security threats.²⁶ The Rand Corporation defined military doctrine as a basic set of principles that guide military forces as they pursue national security objectives.²⁷ These principles can range from the policies and procedures set by a specific military branch to the tactics and techniques the military trains. Military doctrine undoubtedly fundamentally guides the preparation and execution of military operations. The doctrine generally contains three key elements. The first element is a theory that defines how something works and leads to the achievement of goals. The second element is authority, which the doctrine especially considers because, without authority, there is no implementation. The third cultural element, as in every activity, defines who makes up the organisation and who its members are.²⁸ Accordingly, doctrine answers the questions: how does the military perceive itself (“Who are we?”), what is its mission (“What do we do?”), and how should the mission be accomplished (“How do we do it?”)?²⁹

For AI to exert influence and represent a factor of change in the use of military forces, it must become part of the army’s doctrine. Approaching the new technology to the doctrine must be gradual and clearly defined. Through the possibility, the framework of use, acceptance and creation of trust in the military system, clear ethical belief, and implementation in organisational processes, the path of changes in the use of military forces can be traced through the use of new technology. From the current point of view, that process is not even close to realisation, especially since there is no ethical acceptability of autonomous lethal military systems in society. Also, the small number of military weapon platforms in use at the operational-tactical level does not support the fact that AI will become a significant factor of change in the army in the near future.

The tentative definition of the doctrine does not provide much space for AI as a factor of change in the use of military forces. One of the principles for approaching this complex issue can be defined through the theory of technological constructivism, which sees technology as a system of values whose development is conditioned by the demands of society.³⁰ Technology

²⁶ *Doktrina Vojske Srbije*, Medija centar “Odbrana”, Beograd, 2010.

²⁷ *Military Doctrine*, RAND corporation, Santa Monica, <https://www.rand.org/topics/military-doctrine.html>, 11.12.2023.

²⁸ Harald Hoiback, *Understanding Military Doctrine: A Multidisciplinary Approach*, Routledge, 2018.

²⁹ Keith Grint & Brad Jackson, “Toward ‘Socially Constructive’ Social Constructions of Leadership”, *Management Communication Quarterly*, Vol. 24, No. 2, 2010, 348–355, DOI: <https://doi.org/10.1177/0893318909359086>.

³⁰ Isik Ayse Derya, “Use of technology in constructivist approach”, *Educational Research and Reviews*, Vol. 13, No. 21, 2018, 704–711, DOI: <https://doi.org/10.5897/ERR2018.3609>.

can manifest itself through various technical achievements. However, it cannot be equal to a human in determining the rules. The role of Artificial Intelligence in this process will certainly be limited to the functions of overseeing the alignment of the armed forces processes with their doctrine, identifying what has worked in the past, and supporting assessments of the quality and impact of doctrine on some future challenges. Adding AI as an assistive technology to structures dealing with the development of doctrine would require a clear definition of the place, role, and scientific confirmation of capabilities because, otherwise, the team of experts would not be able to understand and make the right decisions. Simply put, military leaders and thinkers must gain confidence in any new technology for it to become part of some future doctrine.

The culture of doctrine-making and the use of military forces is also where the place and role of AI need to be found. Culture shapes the armed forces regarding principles, identity, and values. Just as the culture of living shapes society and the strategic culture shapes the strategic approach, the culture of the use of military forces must accept the new trend to be defined as an indivisible whole of the military system. In this context, doctrines can also define values and principles about human interaction with AI systems, including that AI should serve humans, not vice versa. Such a cultural assumption should be the basis of the development of relations and within the framework of positive ethical norms in society. The doctrine can be a tool for defining ethical standards for the development, procurement, and use of AI-based systems. Since military doctrines are drafted in accordance with international law and generally call upon members of the armed forces to respect international law, the doctrine may also define the modalities of such advanced systems and the compliance of operational use with international law. The doctrine is, therefore, an important means of imposing restrictions on the use of AIs, i.e., it can imply the definition of a general requirement for meaningful human control or the prohibition of delegation of certain functions to systems managed by AI.³¹

Doctrine can play a significant role in setting the basic principles, values, and parameters for the use and interaction of soldiers and systems with AI. A prerequisite for such activity is that military doctrine clearly defines how the armed forces perceive, understand, and value AI. If we assume a high level of AI autonomy in the future, the armed forces may need to specify whether they consider it a tool or an accomplice. In this sense, the doctrine can define whether the armed forces perceive AI as a simple mathematical or technical system or rather as a tool with cognitive abilities that can act as an autonomous influence.³²

³¹ Tobias Vestner, *From Strategy to Orders: Preparing and Conducting Military Operations with Artificial Intelligence*, Edward Elgar Publishing, Geneva, 2023.

³² Thomas A. Drohan, *Artificial Intelligence in the Operational Information Environment: The Need for Proactive Doctrine*, OTH, <https://overthehorizonmdos.wpcomstaging.com/2020/02/26/>

Undoubtedly, a significant problem will be the potential for artificial intelligence to be incorporated into organisational procedures and influence shifts in the military's mode of operation. As in any case, when there are important changes in the concept of the system, there are also changes in the doctrine. In this particular case, the doctrine can set the principles and parameters for the integration of AI into organisational processes. The method of use will also define the necessary changes; the procedure can be considered in two ways. Firstly, whether the AI will be a direct, active participant in the armed struggle, and secondly, whether it will be in the role of observer and assistant. Whatever the function of the changes, they will have to occur in the process of operational planning, that is, in the process of deciding on the use of military forces.

At the end of this chapter, the question remains, "Have any of the states published a doctrine of the use of military force under consideration by the AI?" The only thing that can be considered a basis for the development of some future doctrine are two documents, one from the United Kingdom and the other from the US. The UK Ministry of Defence has unveiled the "Doctrine for the Use of Unmanned Aircraft". The doctrine defines that an autonomous system can understand the intent and direction of a higher level. Based on this understanding and perception of its environment, such a system can take appropriate actions to achieve the desired end state. It is able to decide on a course of action among numerous alternatives without depending on human supervision and control, although they may still be present. While the overall activity of an autonomous drone will be predictable, individual actions may not be. The way the terms are defined is important as they relate to the UK policy on the use of autonomous weapons and their interpretation of international law.³³ Practically, this doctrine set the basic postulate and gave the United Kingdom primacy in the field of the application of AI in autonomous weapon systems.

Another country made a step forward together with the United Kingdom. The US Department of Defence has adopted five ethical principles for the development and use of AI. Systems must be accountable, impartial, consistent, reliable, and manageable. These principles state that ministry staff are responsible for the "development, implementation, and use" of the AI system and must, therefore, demonstrate a good level of (human) judgement.³⁴ US Department of Defence Directive 2012 3000.09 sets out the

artificial-intelligence-in-the-operational-information-environment-the-need-for-proactive-doctrine, 11.08.2023.

³³ *Unmanned Aircraft Systems*, UK Ministry of Defense, https://assets.publishing.service.gov.uk/media/5a823670ed915d74e6236640/doctrine_uk_uas_jdp_0_30_2.pdf, 20.12.2023.

³⁴ *AI Principles: Recommendations on the Ethical Use of Artificial Intelligence by the Department of Defense*, Defense Innovation Board - Department of Defense, https://media.defense.gov/2019/Oct/31/2002204459/-1/-1/0/DIB_AI_PRINCIPLES_SUPPORTING_DOCUMENT.PDF, 21.12.2023.

US position on lethal autonomous weapon systems. Through the legal basis, it identifies three categories of intelligent weapon systems: autonomous, semi-autonomous, and autonomous systems under human control. It also sets general boundaries for their operation and standards regarding the role of human operators and legal prerogatives.³⁵ Similar considerations and reports have been defined by the EU, mentioning the military obligation in the development and use of autonomous systems.

The impact of AI as a factor in changing the use of force in the doctrinal environment is still far from widespread application at the global level. No generally binding and accepted doctrine fully accepts the postulates of AI as part of the planning, preparation, and execution of military operations. It is unlikely that AI will have a significant function in creating military doctrine beyond its evaluation and revision because a doctrine serves to define and regulate military organisational issues and aspects of military operations that are strongly related to beliefs, values, and identity. Nevertheless, precisely because of this function, the doctrine has a significant role in defining the fundamental relationship of the armed forces towards AI.

Artificial intelligence resources

For an entity to become a factor of change in military systems, it must be based on a real resource. A resource is any object, material, service, or capability that can be used to achieve a specific goal. By analysing the content from the previous two parts, we can conclude that AI has the potential to change the military forces. However, the potential itself, without clearly defined resources, cannot find practical and useful value. Looking at the concept of resources from a technological point of view, we can single out several important areas currently the most represented and with a significant impact factor on the military: analytics and machine learning, robotics and automation, and weapons and defence. These resources could have a significant impact on the military. First, for the military to improve its defence capabilities; second, to improve its offensive capabilities; and third, to optimise costs.

If we were to consider AI as a conceptual solution with a complete foundation in the theory of warfare and ethical acceptance in society, then according to logic, the basic resources would be normative-legal regulation, that is, a clear definition in the strategic-doctrinal determinants of a state. From the previous two chapters, through the analysis of the strategic-doctrinal framework, we saw that in order for something to become part of the military system, it must be widely accepted, scientifically based, and recognised as expedient in the domain of the theory of war. In accordance

³⁵ "Autonomy in Weapon Systems – DoD Directive 3000.09", Office of the Under Secretary of Defense for Policy, 25.01.2023.

with the non-introduced, it can be reported that the basic resources of the AI could be defined by the following:

- The first and most important resource is the man
- Strategic foundation
- Doctrinal arrangement
- Technological platform development and implementation in lethal autonomous weapon systems
- Acceptance of AI values in the military environment, and
- Defining legal and ethical norms.

The aforementioned six resources represent the basis for the inclusion of a technological platform as a factor of change in the military environment.

A question arising directly from the resource is: "Does AI change the nature of war?" Baptist states in his article that AI can change the nature of war but not nature itself. The human nature of war cannot be excluded under any circumstances. He treats the influence of AI on the nature of war through three distinct layers: the physical world, the power of the mind, and the power of feeling.³⁶ Clausewitz states that psychology, ethics, politics, passion, pain, and death are the essence of war. The essence is given by his trinity of war, i.e., violence, hatred, and reason.³⁷ If we combine the thoughts of the two previous authors, we get the answer that the fulfilment of the first resource for the AI to be almost like a human leads us to a paradoxical situation because we equate the human and the non-human.

The strategic and doctrinal arrangements were discussed in detail in the previous two chapters. Certainly, the first steps have been taken, especially in the strategy domain, while doctrinal solutions will wait for some future time. From the point of view of these two resources, AI certainly has a future as a factor of change in military systems.

The development of a technological platform and its implementation in autonomous lethal weapon systems is certainly the resource that is most represented in the general public and recognised as the framework in which AI is currently developing the most. Technology is proactive and develops faster every day, especially in the military. "The use of autonomy and AI will play an increasingly vital role in military operations in places like the Middle East, where US forces no longer have a significant military presence", US General Michael Curilla said.³⁸ During his presentation, he mentioned a large

³⁶ Baptiste Alloui-Cros, "Does Artificial Intelligence Change the Nature of War?", *Military Strategy Magazine*, Vol. 8, No. 3, 2022, 4-8.

³⁷ Karl fon Klauzevic, *O ratu*, Vojno delo, Beograd, 1951.

³⁸ David Vergun, *Artificial Intelligence, Autonomy Will Play Crucial Role in Warfare, General Says*, DOD News, Washington, <https://www.defense.gov/News/News-Stories/Article/Article/2928194/artificial-intelligence-autonomy-will-play-crucial-role-in-warfare-general-says/>, 12.12.2023.

number of technologies that have found their application in the army and are based on AI. Josh Luckenbaugh discusses how AI technologies in the intelligence field will provide “intelligence superiority” to military units in the field.³⁹ Without pointing out and showing lethal autonomous combat systems, the technological supremacy of AI in military applications over other competing technologies is clearly visible. Several major countries have shown part of their development projects, mainly based on unmanned autonomous platforms and autonomous vehicles with lethal weapons.

The actualisation of the “revolution in military affairs” is perhaps one of the possible solutions for public acceptance of the value of AI in the military system. Some authors, such as Owen Daniels, believe that assessing the scale and immediacy of AI’s impact on future warfare challenges analysts and policymakers. A mental model that breaks down the technological and human factors involved in military innovation can help parse hyperbole and reality.⁴⁰ Another method that would ensure the acceptance of AI both in the military environment and in the general public is marketing through humane technologies from the domains of health, ecology, and economy. When an ordinary person accepts that some technology is useful, it is well on its way to materialising in all segments of society, including the military.

The last but not least important resource is the legal and ethical norms for the use of AI. Analysing the use of AI allows us to distinguish moral, ethical, and legal areas that require responses before it can be widely used in military operations. Japertas and Simonavikute discussed the use of AI from the perspective of law and ethics in combat operations. They stated that all these challenges can be divided into the following components: social, moral, legal, political, military, and technical issues. The analysis of ethical and legal aspects according to the previously mentioned form can lead to several conclusions. The first is that there are unusual challenges in ethics and legislation. Another is that the use of AI and robotic systems, disregarding human rights and the challenges of warfare, may have particular consequences for the users of the systems. The third relates to the technological dependence of soldiers, which can be a challenge for military leadership in planning and conducting operations. Ultimately, the unwise use of AI in military operations can lead to asymmetric resistance.⁴¹ The conclusion is that ethical acceptance will

³⁹ Josh Luckenbaugh, *Army Hopes AI Will Give Soldiers An Information Advantage*, NDIA, Arlington, <https://www.nationaldefensemagazine.org/articles/2023/7/21/army-hopes-ai-will-give-soldiers-an-information-advantage>, 12.12.2023.

⁴⁰ Owen J. Daniels, *The AI “Revolution in Military Affairs: What Would it Really Look Like?*, The Lawfare Institute, <https://www.lawfaremedia.org/article/ai-revolution-military-affairs-what-would-it-really-look>, 11.12.2023.

⁴¹ Saulius Japertas & Agne Simonaviciute, “Ethical and Legal Aspects of the use of Artificial Intelligence in Combat Operations”, *Challenges to national defense in cotemporary geopolitical situation*, Vol. 2020, No. 1, 2020, 193-200, DOI: <https://doi.org/10.47459/cndcgs.2020.25>.

necessarily lead to the legal regulation of the status of AI and its products; until then, everything is up to the person and his moral and ethical values. In any case, the relationship between a smart machine and a human must not lead to a situation where a human is left out of the loop and unable to control something they have produced.

Conclusion

By analysing three key elements, namely strategic positioning, doctrinal foundation, and consideration of the position of resources, it can be concluded that AI has the potential to be one of the factors driving change in the use of military forces in different domains and scales. The degree of transformation of the military forces will depend on the fulfilment of the resources described in the third chapter. However, this also depends on the role and functions that the military will assign to AI. Roles and functions will define the dynamic interrelationship between the AI and the main instruments for the preparation and execution of military operations. This mutual relationship is dynamic and will most likely change with the growth of available resources. The interaction between human operators and the AI system will be the basis of system development and the future transformation of military forces. It is difficult to predict how this relationship will manifest itself with the increase in the AI's ability to get closer to the person in the thought process.

Undoubtedly, the development of the strategy and doctrinal regulation of the use of AI must be a continuous process in the domain of currently available technological solutions for the defence system. AI is likely to support military strategy, especially for forecasting and planning. The human element of strategy will probably remain crucial, as strategy relies on instinct and values. However, there is a possibility that military personnel will become too dependent on AI. For military doctrine, the role of the AI is likely to be limited to evaluating and assisting in the revision of doctrine. According to the ethical-legal definition, AI is a process that should be accompanied by a gradual, wider acceptance in the public sector. Imposing technology without taking into account the social factor is the wrong direction and will only meet with non-acceptance and move away from the ultimate goal. That ultimate goal should find a balanced relationship between the traditional values of life and modern technologies that seek to take over a part of human integrity. However, it is crucial to proactively define core principles, values, and standards in parallel rather than simply adapting to technological developments in order not to fall behind, become path-dependent, or face unexpected or unintended consequences.

There is no consensus on the timeline for the development of AI. However, experts agree that there is likely to be a steady increase in the integration of AI into military systems. Overall, AI has the potential to be a

decisive factor in the future of warfare. Armed forces that successfully develop and implement AI technology will have a significant advantage over those that do not. AI has become a transformative force in various sectors, so the military domain is no exception. With its ability to process massive amounts of data, analyse complex patterns, and make instant decisions, AI has revolutionised military technology.

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Bibliography

- AI Principles: Recommendations on the Ethical Use of Artificial Intelligence by the Department of Defense*, Defense Innovation Board – Department of Defense, https://media.defense.gov/2019/Oct/31/2002204459/-1/-1/0/DIB_AI_PRINCIPLES_SUPPORTING_DOCUMENT.PDF, 21.12.2023.
- Alloui-Cros Baptiste, "Does Artificial Intelligence Change the Nature of War?", *Military Strategy Magazine*, Vol. 8, No. 3, 2022, 4–8.
- An Artificial Intelligence Strategy for NATO*, NATO, <https://www.nato.int/docu/review/articles/2021/10/25/an-artificial-intelligence-strategy-for-nato/index.html>, 11.11.2023.
- Artificial Intelligence in Support of Defense*, Ministry of Defense, <https://www.defense.gouv.fr/sites/default/files/aid/Report%20of%20the%20AI%20Task%20Force%20September%202019.pdf>, 16.12.2023.
- "Autonomy in Weapon Systems - DoD Directive 3000.09", Office of the Under Secretary of Defense for Policy, 25.01.2023.
- Samuel Bendett, *Russian Military Debates AI Development and Use*, Center for a New American Security, <https://www.cnas.org/publications/commentary/russian-military-debates-ai-development-and-use>; 10.12.2023.
- Boulanin Vincent, Lora Saalman, Petr Topychkanov, Fei Su & Moa Peldán Carlsson, *Artificial Intelligence, Strategic Stability and Nuclear Risk*, Stockholm International Peace Research Institute, Stockholm, 2020.
- Branch William A., *Artificial Intelligence and Operational-Level Planning: An Emergent Convergence*, School of Advanced Military Studies, Fort Leavenworth, 2018.
- China's National Defense in the New Era*, The State Council Information Office of the People's Republic of China, <https://chinaus-icas.org/wp-content/uploads/2019/09/Chinas-National-Defense-in-the-New-Era.pdf>, 10.12.2023.

- Daniels Owen J., *The AI "Revolution in Military Affairs: What Would it Really Look Like?*, The Lawfare Institute, <https://www.lawfaremedia.org/article/ai-revolution-military-affairs-what-would-it-really-look>, 11.12.2023.
- Defense artificial intelligence strategy*, UK Ministry of Defense, https://assets.publishing.service.gov.uk/media/62a7543ee90e070396c9f7d2/Defence_Artificial_Intelligence_Strategy.pdf, 15.12.2023.
- Deeks Ashley, Noam Lubell & Daragh, "Machine Learning, Artificial Intelligence, and the Use of Force by States", *Journal of National Security Law & Policy*, Vol. 10, 2018.
- Derya Isik Ayse, "Use of technology in constructivist approach", *Educational Research and Reviews*, Vol. 13, No. 21, 2018, 704–711, DOI: <https://doi.org/10.5897/ERR2018.3609>.
- Drohan Thomas A., *Artificial Intelligence in the Operational Information Environment: The Need for Proactive Doctrine*, OTH, <https://overthehorizonmdos.wpcomstaging.com/2020/02/26/artificial-intelligence-in-the-operational-information-environment-the-need-for-proactive-doctrine>, 11.08.2023.
- Doktrina Vojske Srbije*, Medija centar "Odbrana", Beograd, 2010.
- Final Report*, National Security Commission on Artificial Intelligence, <https://reports.nsc.gov/final-report/>, 15.11.2023.
- Grint Keith & Brad Jackson, "Toward 'Socially Constructive' Social Constructions of Leadership", *Management Communication Quarterly*, Vol. 24, No. 2, 2010, 348–355, DOI: <https://doi.org/10.1177/0893318909359086>
- Hoiback Harald, *Understanding Military Doctrine: A Multidisciplinary Approach*, Routledge, 2018.
- Japertas Saulius & Agne Simonaviciute, "Ethical and Legal Aspects of the use of Artificial Intelligence in Combat Operations", *Challenges to national defense in contemporary geopolitical situation*, Vol. 2020, No. 1, 2020, 193–200, DOI: <https://doi.org/10.47459/cndcgs.2020.25>.
- Johnson James, "The AI-cyber nexus: implications for military escalation, deterrence and strategic stability", *Journal of Cyber Policy*, Vol. 4, No. 3, 2019, 442–460, DOI: <https://doi.org/10.1080/23738871.2019.1701693>.
- Klauzevic Karl fon, *O ratu*, Vojno delo, Beograd, 1951.
- Layton Peter, *Algorithmic warfare: Applying artificial intelligence to warfighting*, Air Power Development Centre, Canberra, 2018.
- Luckenbaugh Josh, *Army Hopes AI Will Give Soldiers An Information Advantage*, NDIA, Arlington, <https://www.nationaldefensemagazine.org/articles/2023/7/21/army-hopes-ai-will-give-soldiers-an-information-advantage>, 12.12.2023.
- Military Doctrine*, RAND corporation, Santa Monica, <https://www.rand.org/topics/military-doctrine.html>, 11.12.2023.

- National AI policies & strategies*, OECD.AI, 2021, <https://oecd.ai/en/dashboards/overview>, 11.11.2023.
- Noël Jean-Christophe, "Will artificial intelligence revolutionize the art of war?", *Politique étrangère*, Vol. 1, No. 4, 2018, 159-170, DOI: <https://doi.org/10.3917/pe.184.0159>.
- Romaniuk Scott Nicholas, *Military Strategy and the Three Levels of Warfare*, Defense Report, <https://defencereport.com/wp-content/uploads/2017/11/Romaniuk-Military-Strategy-and-the-Three-Levels-of-Warfare.pdf>, 11.11.2023.
- Russia's AI Enabled Military Ecosystem and Its Algorithmic Warfare*, <https://www.idsa.in/idsacomments/russias-ai-enabled-military-ecosystem-ssharma-160322#:~:text=1%20Russia%20is%20heavily%20committed,systems%20in%20the%20recent%20conflict>, 11.07.2023.
- Sloan Elinor C., *Modern Military Strategy: An Introduction*, Taylor & Francis, London, 2016, DOI: <https://doi.org/10.4324/9781315740034>.
- Summary of the NATO Artificial Intelligence Strategy*, NATO, https://www.nato.int/cps/en/natohq/official_texts_187617.htm, 11.11.2023.
- Summary of the 2018 Department of Defense Artificial Intelligence Strategy, *Department of Defense*, <https://media.defense.gov/2019/Feb/12/2002088963/-1/-1/1/SUMMARY-OF-DOD-AI-STRATEGY.PDF>, 11.11.2023.
- Svečin Aleksandar A., *Strategija*, VIZ, Beograd, 1956.
- The US Army Multi-Domain operations 2028*, U.S. Army https://www.army.mil/article/243754/the_u_s_army_in_multi_domain_operations_2028, 11.11.2023.
- Unmanned Aircraft Systems*, UK Ministry of Defense, https://assets.publishing.service.gov.uk/media/5a823670ed915d74e6236640/doctrine_uk_uas_jdp_0_30_2.pdf, 20.12.2023.
- Vergun David, *Artificial Intelligence, Autonomy Will Play Crucial Role in Warfare, General Says*, <https://www.defense.gov/News/NewsStories/Article/Article/2928194/artificial-intelligence-autonomy-will-play-crucial-role-in-warfare-general-says/>, 12.12.2023.
- Vestner Tobias, *From Strategy to Orders: Preparing and Conducting Military Operations with Artificial Intelligence*, Edward Elgar Publishing, Geneva, 2023.
- "Указ Президента Российской Федерации от 10.10.2019 г. № 490 О развитии искусственного интеллекта в Российской Федерации", Президент России, <http://www.kremlin.ru/acts/bank/44731>, 11.11.2023.