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Comparative Analysis of NATO and U.S. Approaches to Multi-Domain Operations

Komparativní analýza přístupů NATO a USA k multi-doménovým operacím

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Abstract: The article is a thematic sequel of a previous work addressing the concept of Multi-Domain Operations (MDO) in the context of modern warfare. It highlights the differences in the conceptual approaches to MDO as applied by the U.S. Armed Forces and NATO in response to current security challenges. The study outlines the shift by NATO and the U.S. from traditional joint operations to integrated strategies within respective operational domains. Based on a literature review and content analysis of doctrinal documents, it identifies a fundamental difference in the conceptual approaches of NATO and the U.S. to MDO. While the U.S. approach emphasizes a military-oriented model that generates synergistic effects through coordinated operations and technologically driven dominance, NATO's framework favours a comprehensive civil-military model of strategic integration.

Abstrakt: Článek je tematickým pokračováním předchozí práce zabývající se obecně multi-doménovými operacemi v kontextu moderního válčení. Identifikuje rozdíly v koncepčních přístupech k multi-doménovým operacím, tak jak je uplatňují ozbrojené síly USA a NATO v reakci na současné bezpečnostní výzvy. Studie nastiňuje posun USA i NATO od tradičních společných operací k integrovaným strategiím v rámci příslušných operačních domén. Na základě rešerše literatury a obsahové analýzy doktrinálních dokumentů identifikuje zásadní rozdíl v koncepčních přístupech NATO a USA k multi-doménovým operacím. Zatímco americký přístup klade důraz na vojensky orientovaný model, který generuje synergické efekty prostřednictvím koordinovaných vojenských operací a technologicky řízené dominance, rámec NATO upřednostňuje komplexní civilně-vojenský model strategické integrace.

Keywords: Comprehensive Approach; Military Operation; Multi-Domain; NATO; U.S. Armed Forces.

Klíčová slova: komplexní přístup; vojenská operace; multi-doménový; NATO; ozbrojené síly USA.

INTRODUCTION

The article examines critical divergences in the Multi-Domain Operations (MDO) concepts as they are implemented in the U.S. Armed Forces and NATO, in the context of contemporary conflicts. Today, these distinctions are increasingly obsolete. *Modern warfare is shaped by multidomain operations, where the battlespace is continuous and non-linear. The combination of new technology and new operational concepts, the rapid evolution of disruptive technologies - such as artificial intelligence, nanotech, biotech, UAVs, autonomous systems, drone swarms, smart munitions, and loitering weapons - have resulted in a paradigm shift in the conduct of warfare and have reflected the ongoing Revolution in Military Affairs (RMA).* (Jordan 2016)

In response to evolving global threats, the U.S. Army updated its strategic approach in 2017 by introducing the concept of *Multi-Domain Battle*. This concept was subsequently refined into what is now known as *Multi-Domain Operations (MDO)*, reflecting the operational application of respective national concepts and doctrines. MDO are designed to address competition and conflict with near peer adversaries such as China and Russia across all operational areas including physical, virtual, and cognitive dimensions. On the other hand, the NATO concept of MDO implies the capabilities of the armed forces to operate in the areas of air, sea, land, cyber and space, according to the five domains recognized by NATO, and also the operational dimensions, which include the non-military means, such as diplomacy, economics and the media. As a result, the modern approach to warfare requires adapting doctrine, force structure, and command and control to operate effectively across the interconnected operational domains: land, air, maritime, cyber, and space. Thus, both U.S. and Allied concepts of MDO are intended to go beyond the currently implemented doctrines that define the use of forces in joint operations, where individual services act independently and sometimes in isolation, even if their actions are well-coordinated. This traditional approach assumed that fully integrating all forces and actors in an operation was nearly impossible due to various constraints, such as political, economic, operational, and timing/resource challenges.

1 METHODOLOGY

The ongoing analytical study addressing operational domains and MDO in the context of modern warfare is the result of comprehensive research conducted by the Centre for Security and Military-Strategic Studies and supported by the Ministry of Defence of the Czech Republic, titled *Long-Term Development of Organization – Armed Conflict (DZRO OZKON)*.

The methodology of the analytical study is based on a literature review aimed at mapping, summarising, and assessing background information on U.S. and NATO approaches to MDO. Notably, the method applied in this phase of the study is virtually identical to that used in the previous phase. As in the first part of the study, a detailed search was conducted of unclassified documentation and publications available from open sources. For this purpose, databases managed by relevant national and NATO institutions were used to identify pertinent documents (see Table 1 – List of Databases Used for Literature Research). Based on the identified subject-matter publications (see List of References), a literature review and content analysis were conducted to extract findings specifically related to the operating environment, operational domains, and approaches to MDO.

Table 1: List of Databases Used for Literature Research

U.S. Army Training and Doctrine Command (TRADOC)	https://armypubs.army.mil/
US Defense Technical Information Center	https://discover.dtic.mil/
UK Defence and Armed Forces	https://www.gov.uk/defence-and-armed-forces
Institut de Recherche Stratégique de l'Ecole Militaire (IRSEM)	https://www.irsem.fr/
Joint Air Power Competence Centre (JAPCC)	https://www.japcc.org/
NATO Science and Technology Organization (NATO STO)	https://www.sto.nato.int/Pages/default.aspx

2 US CONCEPT OF MULTI-DOMAIN OPERATIONS

The U.S. Army originally published the concept *Multi-Domain Battle: Evolution of Combined Arms for the 21st Century, 2025–2040* (TRADOC ARCIC, 2017) with the aim of countering adversary capabilities to deny and disrupt access and freedom of movement (Anti-Access/Area Denial - A2/AD) of Allied forces over long distances in the air, maritime, land, and cyber domains (Jones and Diaz de Leon 2020). The initial conceptualisation of the multi-domain approach, as a new concept of military operations, originates from the U.S. military-focused model, which introduces a complex perspective on joint operations across all domains.

2.1 Origins of the U.S. Concept

From the U.S. Army's perspective, MDO are encompassed within the broader concept of joint operations, which includes the traditional domains of air, sea, and land, as well as the newer domains of information, cyber, and space. In this sense, MDO is understood in a narrower interpretation as operations that involve multiple domains (Jones and Diaz de Leon 2020). MDO can be considered a further evolution beyond *joint operations*, the concept of which can be traced back to the Second World War, such as in *combined operations* - for example, the use of air, naval, and land forces for large Allied landings. The U.S. doctrinal perspectives on different levels of war have, since the 1970s, applied to all forms of warfare - land, sea, and air - and have had an impact on all services: Army, Air Force, Navy, and Marine Corps. There is an underlying unity of basic principles and fundamentals that applies to all forms of organised conflict (Romjue 1984).

According to many U.S. analysts, the term *Multi-Domain Battle* was primarily used to optimise ground combat at the operational and tactical levels and is often regarded as the spiritual successor to the U.S. Army's 1980s doctrine *Air-Land Battle* (Wille 2019). *Air-Land Battle* was developed in response to the threat posed by the Soviet Red Army in Europe and was initially introduced in *Field Manual 100-5* in 1982, with a revised version published in 1986 (Richardson 1997). Although conceived for the European theatre, it was later employed operationally during the First Gulf War against Saddam Hussein's Iraq in 1990–1991 (Black 2022). The challenge faced by the U.S. Army, in collaboration with the U.S. Air Force during the development of the doctrine, was to establish effective command and control (C2) of forces capable of defeating an adversary on the scale of the Soviet Red Army by integrating manoeuvre across the traditional air and land domains. Nevertheless, some sceptics argue that the *Multi-Domain concept is merely a new coat of paint applied to the earlier Air-Land Battle doctrine, which had already emphasised the fully three-dimensional nature of modern warfare by integrating sea, air, land, and space systems to defeat an adversary* (Perkins and Olivieri 2018).

On the other hand, the operational execution of *Air-Land Battle* during the First Gulf War in 1991 served as confirmation that U.S. technological superiority translated into multi-domain dominance (Wille 2019; Diaz de Leon 2021; Black 2022). This outcome sparked a broader debate in the 1990s regarding U.S. military doctrine in the context of the *Revolution in Military Affairs (RMA)*, understood as the application of scientific and technological advancements to force structure and methods of warfare, with the objective of fundamentally transforming the conduct and nature of war.

In reaction to the RMA, and under the influence of Chinese strategic thought in the 1990s, the concept of asymmetric warfare gained prominence. It referred to undeclared conflict between actors of significantly unequal military or financial power, in which the weaker actor - often lacking conventional capabilities - employs irregular or innovative methods to exploit the vulnerabilities of a militarily superior opponent. The aim is to transform weakness into strategic advantage by striking unexpectedly, creating psychological shock, and undermining the stronger actor's freedom of action. This approach aligns with the Chinese concept, which refers to the intelligent and innovative use of

existing capabilities to defeat a seemingly much stronger adversary by exploiting physical, technological, or societal vulnerabilities.

2.2 Contemporary Characteristics of the U.S. Concept

The current concept of MDO was born with the observation that the future war would not have the aspect of the conflict in Afghanistan or Iraq, given the rise in Chinese military capabilities, and that it would therefore be necessary to dominate adversaries in the traditional domains of land, air or sea, but also to ensure the US superiority in cyberspace, including the information and electromagnetic fields, and outer space. The MDO concept builds on the *Army Operating Concept*¹ and associated learning to identify how the Army, working as part of the Joint Force, will operate against these peer adversaries to maintain U.S. interests, deter conflict, and, when necessary, prevail in war. The purpose of the *Multi-Domain Battle* concept is to drive change and design for the future Army. It will provide the foundation on which TRADOC conducts capabilities-based assessments to refine required capabilities, identify gaps, and determine potential capability and policy solutions for future forces. (TRADOC ARCIC, 2017) The concept provides a detailed description of potential adversary actions and outlines the priorities of the U.S. Army, the other forces, and the government community for capability development in preparation for and implementation of MDO during the 2025 - 2040 timeframe.

The original U.S. concept of *Multi-Domain Battle* evolved into the current *Multi-Domain Operations* Concept (Judson 2018) through the U.S. Army TRADOC study published in December 2018. (TRADOC ARCIC 2018) The term *battle* was replaced with *domain* as it more accurately reflected the U.S. Army's vision of joint warfare. However, the foundational idea remained focused on how the U.S. Army can integrate land combat into joint force coordination against highly capable adversaries - leveraging all available firepower - and how the U.S. Armed Forces can regain overmatch in an increasingly complex and contested operational environment.

In the final doctrine the U.S. Army (FM 3-0, 2022) defines MDO as *the combined arms employment of joint and Army capabilities to create and exploit relative advantages that achieve objectives, defeat enemy forces, and consolidate gains on behalf of joint force commanders*. The new FM 3-0 acknowledges that the operational environment encompasses not only the air, land, and maritime domains, but also space and cyberspace. It emphasizes that the U.S. Army operates across the physical dimension, applies influence in the information dimension, and achieves victory in the human dimension.

Military formations will be designed to leverage *comparative advantages* across these three dimensions. The FM 3-0 states as well that *all operations are multidomain*

¹ From U.S. TRADOC's perspective, the Army both depends on and supports air and naval forces across the land, air, maritime, space and cyberspace domains. Thus, the Army Operating concept describes how future Army forces, as part of joint, interorganizational, and multinational efforts, operate to accomplish campaign objectives and protect U.S. national interests.

operations. Army forces employ organic capabilities in multiple domains, and they continuously benefit from air and maritime strategic transportation and space and cyberspace capabilities that they do not control, including global positioning, satellite communications, and intelligence, surveillance, and reconnaissance (ISR).

The doctrine will require the U.S. Army to understand how land forces affect the other four domains and how capabilities employed in those domains impact outcomes on the ground. The document (FM 3-0 2022, 1-18) explicitly states that: *Within the context of an operational environment, a domain is a physically defined portion of an operational environment requiring a unique set of warfighting capabilities and skills. Land operations require mastery of terrain and ground manoeuvre. Cyberspace operations require mastery of digital information systems and computer code. Space, air, and maritime operations likewise require specific capabilities and skills, which manifest themselves in separate Services within the joint force. Although most domains align with the skills developed in a particular Service, no Service focuses entirely upon or exerts total control of that single domain during operations. However, the domains present very different conditions of warfare and require the specialized warfighting skills developed by the different Services and subcomponents within each of the Services.*

3 NATO APPROACH TO MULTI-DOMAIN OPERATIONS

Multi-domain is the concept which has been largely used in recent years to integrate the new cyber and space domains² within the approach to military operations beyond the traditional domains of land, sea and air and with the consequent extension of the battlefield. This discussion is even more challenging when working with allied partners because NATO has not yet published in its reference document (NSO 2023) a comprehensive definition for the term - multi-domain. It does have a definition for *Operating Environment*, which seems to be used interchangeably with the domain in numerous NATO publications. However, its definition seems to be more along the lines of conditions and factors than the closer environment term, which aligns with the various recognised operational domains within NATO (land, sea, air, and cyberspace). (JAPCC 2019, 2)

NATO has traditionally lagged several years behind in adopting concepts developed by the U.S. Armed Forces, and the concept of MDO is no exception. The approach and corresponding doctrines of MDO, as previously developed by the U.S. Army, have also been adopted by NATO, and a similar concept is currently being explored by several Allied nations. As with the U.S. approach, NATO's multi-domain concept is intended to integrate all feasible actions to produce the desired effects across all five operational domains.

However, it is not simply a matter of copying and pasting a U.S. concept developed at the joint level. NATO has incorporated the principles of MDO into its own strategic

² Cyberspace was identified by NATO as a domain at the NATO Warsaw Summit in 2016. The Alliance recognized that a cyber-attack can cause damage comparable to an armed attack and therefore can become a case of collective defense within the meaning of Article 5 of the Washington Treaty.

framework, while the UK has developed a closely related model known as Multi-Domain Integration. France, Germany, and other Allied nations are actively studying these concepts and adapting them to their national contexts. Strategic competitors, especially China and Russia, have also developed their own doctrines. China has long promoted its model of *unrestricted warfare* integrating military and non-military tools of statecraft. Russia, drawing from its Cold War experience and further shaped by the so-called *Gerasimov Doctrine* (Galeotti 2016; Spišák 2020), has implemented hybrid warfare strategies aimed at political destabilization and influence. MDO aim to provide a comprehensive response to such methods. The ongoing conflict in Ukraine, which in fact began in 2014, serves as a practical case study for understanding how Russian hybrid warfare methods have been applied, both through implementation and omission.

3.1 Generic Implications of the Multi-Domain Operations Concept

The NATO approach to MDO includes a proactive posture beginning in the phase of diplomatic confrontation between states, employing deterrence capabilities in coordination with political and military instruments of power. It considers the actions of state and non-state actors that seek to increase the level of competition while remaining below the threshold of armed conflict. Deterrence of adversarial behaviour that threatens Allied civil and military interests is achieved through the comprehensive use of diplomatic, political, and economic channels, while simultaneously demonstrating superiority in the employment of capabilities across the cyber, electromagnetic, and space domains. The information domain is likewise recognised as a contested environment in which NATO must implement strategies to counter disinformation, prevent the malign use of digital platforms, and mitigate efforts aimed at destabilising Allied societies by exploiting social, ethnic, or national divisions.

Should it no longer be possible to contain competition below the threshold of armed conflict, NATO's multi-domain approach enables the design and execution of operations aimed at penetrating *Anti-Access/Area Denial (A2/AD)* environments. These operations seek to degrade, disrupt, or defeat adversary A2/AD systems, thereby enabling freedom of movement and access through integrated strategic and operational manoeuvres. While MDO involve high levels of technological advancement, particularly in cyber, space, and the electromagnetic spectrum, their military application requires deep transformation in terms of integrated defence planning process. In 2021, NATO's Military Committee tasked the two Strategic Commands, i.e. Allied Command Transformation (ACT) and Supreme Headquarters Allied Powers Europe (SHAPE), to develop an initial concept for MDO that would integrate the Allied strategic view of how forces should operate together at the speed and scale required by modern operations. Both ACT and SHAPE collaborated with Allies and partners to consider the meaning of MDO for NATO and its implications for Alliance forces.

Shortly after that, in March 2022, ACT, in collaboration with the respective centres³ and the UK Ministry of Defence, organised the first conference on MDO to provide greater clarity on the work that needs to be done. The main conclusion was that the concept of MDO is not simply a conventional military tool. This concept needs to be introduced within a broader diplomatic, military, and economic framework. The second conclusion emphasised the urgency of implementing the Alliance's digital transformation, which must deliver a more effective command and control architecture - a project that has been underway for about a decade and without which the concept of MDO would lack coherence. ACT developed the following working definition of MDO: *Orchestration of military activities, across all domains and environments, synchronized with non-military activities, to enable the Alliance to create converging effects at the speed of relevance.* This definition was developed over years through consultations with National Military Representatives and other military and civilian partners. Within NATO, MDO represent the military focus on achieving objectives across all domains and environments, acknowledging that many actors collectively contribute to success. Regarding the NATO approach, one of the typical commonalities that has persisted throughout the development of the MDO concept has been the intention to systemise and synchronise all activities across all domains. That being said, an important consideration in multi-domain operation-related developments is the harmonisation with non-military organisations and member state assets not under a commander's direct control.

3.2 Specific Aspects of Alliance Approach to Multi-Domain Operations

The Alliance's approach to MDO is designed to go well beyond merely expanding the joint approach by incorporating the Space and Cyber domains. It seeks to achieve a level of integration that enables the Alliance to seize and maintain the strategic and operational initiative. This approach aims to synchronize actions across all five operational domains, orchestrating and amplifying available capabilities to exploit surprise, achieve convergence, and ensure success. The ultimate goal is to generate freedom of manoeuvre within the functional battlespace, producing effects across the physical, virtual, and cognitive dimensions. *This requires the effective integration of mutually supporting forces to provide the Alliance with diverse options to address disadvantages in one operational domain by adapting, shifting, and strengthening other operational domains and exploiting opportunities through multi-domain operations* (NSO 2022).

To this end, the Alliance's approach to MDO aims to optimize the full spectrum of capabilities, integrating them across all domains to maximize expected operational effects. Additionally, ACT supports various conceptual development initiatives on this subject through the Multinational Capability Development Campaign (MCDC), including the project *Multi-Domain – A Multinational Understanding*. This effort is also supported by

³ ACT operates the Joint Analysis and Lessons Learnt Centre in Lisbon (Portugal), the Joint Force Training Centre in Bydgoszcz (Poland) and the Joint Warfare Centre in Stavanger (Norway).

the Joint Air Power Competence Centre (NATO Centre of Excellence – CoE) through the development of the *Joint All-Domain Operations (JADO)* project. NATO's MDO concept is derived from the U.S. MDO framework and was defined by ACT at the request of the NATO Military Committee as: *the direction of military activities across all domains and environments, synchronized with non-military activities, to enable the Alliance to deliver convergent effects at the speed of relevance* (NATO C2 COE 2022).

Recent NATO doctrine formally recognizes the critical role of information and communications technology in the conduct of modern warfare (Jones and Diaz de Leon 2020). In current NATO terminology, the term *Joint Operations* refers to activities involving at least two separate services of the armed forces and is not limited to the specific domain(s) in which those activities occur. At the NATO level, the term MDO is broader and more flexible than the U.S. Army's interpretation, as it is adapted differently by each NATO member state. There is a pressing need for NATO to clarify MDO terminology and definitions, particularly for the less doctrinally mature domains of space and cyberspace, as well as to ensure a coherent chain of command. This is particularly crucial at the strategic-political level, where decision-makers must receive clear, concise, and actionable information.

4 CONCEPTUAL DIVERGENCES BETWEEN NATO AND U.S. CONCEPTS

A fundamental distinction between NATO's and the U.S. Army's approach to MDO lies in how superiority across operational domains is conceptualized and pursued. While the U.S. Army traditionally emphasizes achieving temporary and local superiority in critical domains to enable decisive operations, NATO's emerging approach accepts that permanent domain superiority is unlikely against a peer or near-peer adversary. Instead, the focus shifts toward maintaining freedom of action across all domains, enabling the Alliance to seize fleeting opportunities through the convergence of effects created by synchronized actions across domains.

In this context, NATO's concept foresees, where necessary, the development of autonomous actions by individual components - temporally and spatially limited - to generate opportunities that can be exploited by other components. This approach redefines MDO innovatively, emphasizing the simultaneous combination of diverse capabilities and recognizing that each operational context must be understood as unique and indivisible across domains. This differentiation arises particularly from the intersection of the Cyber and Space domains with traditional domains, and from the cross-cutting nature of operations in the information environment.

4.1 Key Distinctions Between NATO and U.S. MDO Concepts

Based on an analytical study of relevant literature, critical elements were identified as key differentiators between the NATO and U.S. approaches to MDO (see Table

2 – Detailed description of identified differentiators). These include: Strategic Autonomy, Definition of MDO, Resource Availability, Conceptual and Doctrine Development, Level of Integration, Command and Control (C2), Technological Integration, Decision-Making, Logistic Support and Sustainment, and Definition and Terminology. These elements were selected due to their direct impact on the formulation, implementation, and operationalization of MDO across strategic, operational, and tactical levels.

The analysis revealed that while both NATO and the U.S. acknowledge the multi-domain character of modern warfare, they diverge in how these domains are conceptualized, prioritized, and integrated. These differences shape not only capability development and doctrinal alignment but also the feasibility of joint and combined operations under a unified MDO framework. Understanding these aspects is essential for enhancing interoperability and coherence among Allied forces.

Table 2: Detailed description of identified differentiators⁴

MDO Concept Elements	U.S. Approach	NATO Approach
Strategic Focus	Orientation on strategic competition with peer adversaries (e.g., China, Russia), emphasizing deterrence and high-end conflict.	Primarily focused on collective defence, resilience, and crisis response within an alliance framework.
Strategic Autonomy	High; can operate independently across domains	Collective; depends on unity among diverse member nations
Definition of MDO	Clearly defined and doctrinally established (e.g., via TRADOC Pam 525-3-1)	Still evolving; varies among member states and lacks a unified NATO-wide definition
Resource Availability	Large budget and national military assets for dedicated MDO capability development	Resource constraints across members; pooling and sharing are necessary
Conceptual Development	More advanced and formalized, with doctrine and experimentation actively shaping force development.	Still evolving; conceptual discussions ongoing with limited integration into formal doctrine.
Doctrine Development	Unified and rapidly updated U.S. Army doctrine	Fragmented; national doctrines differ and NATO harmonization lags
Level of Integration	High degree of joint and interagency integration	Multinational integration with varying levels of interoperability across allies
Command and Control (C2)	Emphasizes seamless integration under a single joint commander with unity of command across domains.	Operates under consensus-based decision-making with national caveats, making integrated C2 more complex.
Technological Integration	Leverages cutting-edge technologies (e.g., AI, autonomous systems, cloud computing) for rapid cross-domain synergy.	Adopts technologies cautiously, aiming for interoperability among diverse national capabilities.

⁴ Due to the limited extent of the article, a full survey of research findings is not included. This part of the analysis is available upon request from the author.

Decision-Making	Accelerated decision-making cycle, supported by defence planning automated software system and AI technologies.	Slower due to need to make consensus among allies
Operational Autonomy	Designed for rapid, decentralized operations with mission command and high decision-making autonomy.	More structured and deliberate, constrained by political consensus and varying national policies.
Logistic support and Sustainment	Global force projection capability with prepositioned stocks, rapid deployment enablers.	Dependent on host-nation support and multinational coordination; mobility constraints persist.
Definition and Terminology	Uses "Multi-Domain Operations" (MDO) emphasizing convergence across all warfighting domains.	Employs "Multi-Domain Operations" more loosely, often synonymous with "multi-domain effects" or "integrated deterrence"

An interim result arising from the analysis of the identified differentiating elements indicates a fundamental divergence in the conceptual foundations of NATO and U.S. approaches to MDO. While both actors acknowledge the multi-domain nature of contemporary conflict, the U.S. approach is characterized by a predominantly military orientation, focusing on achieving strategic and operational initiative through technological superiority and force integration. In contrast, NATO adopts a comprehensive approach, combining military means with political, diplomatic, and economic instruments in accordance with its alliance-based structure. The common denominator in NATO's concept is the emphasis on civil-military synergy and multinational coordination, whereas the U.S. concept rests on unilateral readiness and warfighting dominance. Recognizing this divergence is essential for advancing Allied interoperability and coherence in future MDO.

4.2 Summary of Key Differences between NATO a U.S. Concepts

A crucial finding stemming from the content analysis of relevant thematic articles and publications is the identification of a principal difference between the U.S. and NATO concepts, which subsequently implies other aspects influencing their divergent approaches to MDO. This crucial difference lies in the military/civil character of the instruments of power employed to achieve strategic objectives:

1. The U.S. approach to MDO is primarily focused on achieving operational and strategic initiative through the employment of military power, particularly in high-intensity conflict scenarios against peer adversaries. It emphasizes rapid, decisive action through dominance across all operational domains - land, air, maritime, cyber, space, and the information environment - focusing on technological superiority to disrupt enemy defences, fracture cohesion, and regain advantage within the operational environment.
2. the NATO approach aligns more closely with a comprehensive model of multi-domain engagement. It seeks to combine military power with civilian instruments of power - including diplomacy, information, and economic tools - to achieve strategic initiative and accomplish key tasks outlined in the NATO 2022 Strategic Concept. This

reflects NATO's multilateral character, emphasizing cohesion, deterrence, and resilience through political-military integration rather than pure warfighting dominance.⁵

CONCLUSION

The outcomes of the analysis highlight that the common denominator of both the NATO and United States approaches to MDO lies in their advancement beyond the current military doctrines of joint operations. They focus on the synergistic effect generated by the coordinated conduct of operations across the conventional, cyber, and space domains - which also include the information and electromagnetic environments - and on the ability to produce effects across all three dimensions: physical, virtual, and cognitive.

Success in MDO depends on the integration of all involved factors, particularly military capabilities. It is clear that achieving perfect integration of all capability elements in the field is nearly impossible due to various constraints - political, economic, operational, and related to resource timing - that prevent the simultaneous use of all available assets. Instead, this approach relies on cross-domain synchronization to maintain strategic advantage and initiative over the adversary.

Thus, an effort to improve the capabilities of military units to strengthen their operational effectiveness, interoperability, and multi-purpose, is a necessary prerequisite leading to victory. The application of joint standards and military art embodied in military doctrines undoubtedly contributes to increasing the combat potential of the armed forces as such. (Žižka 2024, 4)

Therefore, there is a need to evolve the current concept of joint and combined operations towards a new non-linear paradigm across domains, especially in light of the extraordinary evolution of technologies used in decision-making processes, sensors, and weapon systems. Both concepts highlight that an effective response to threats in a multi-domain environment also requires strong integration of all Main Capability Areas, allowing for the synchronization of effects through the establishment of synchronized command and control structures that guarantee both unity of command and, where necessary, interaction between the strategic, operational, and tactical levels.

Understanding the strengths and dependencies of joint capabilities in each domain is fundamental to a multi-domain, combined arms approach to operations (FM 3-0 2022, 1-18). To understand security threats while managing effective and timely responses capable of generating stable real-time effects in both physical and virtual operational domains, the armed forces must possess the capabilities to ensure harmonization and

⁵ According to the official NATO website, the principles of the comprehensive approach - coherence of actions, civil-military interaction, and engagement with external partners - are integral to the activities of NATO Headquarters' Crisis Management Task Force as well as the NATO Command and Force Structures. Military means, although essential, are not sufficient on their own to address the many complex challenges to security. The effective implementation of a comprehensive approach to crisis situations requires contributions from nations, international organizations, and non-governmental organizations in a concerted effort.

synchronization of actions and effects. However, it is not possible to generate concrete multi-domain defence capabilities without a decisive and coordinated acceleration of the ongoing process of capability integration - an evolution inevitably embedded within the very concept of MDO.

Thus, both MDO concepts also clearly emphasize the need to develop corresponding military capabilities, with particular importance placed on those capabilities structured within the Main Capability Areas of Command and Control (C2) and Inform (intelligence services), which play a fundamental role. *The Main Capability Areas identify what NATO's military organisation must be able to accomplish to cover the full range of the Alliance's military missions and to guarantee NATO's military effectiveness and freedom of movement. The development of the Main Capability Areas within the Capability Hierarchy took into account existing and accepted capability frameworks from NATO nations and other established capability frameworks and taxonomies* (SHAPE/ACT 2015). The publication defines the Main Capability Areas as an essential link between NATO core tasks and NATO's defence planning. These areas identify what NATO's military organisation must achieve to support the full scope of Alliance military missions and ensure effectiveness. *On the other side, the biggest barrier to get a higher degree of interoperability is the lack of a common military capability terminology across the alliance to describe the multi-domain operating environment, and to communicate changes in that environment.* (Watling 2019, 31) The U.S. needs to support the development of a common military capability terminology, a common systems architecture for sharing situational awareness, and the training required to enable allied formations to understand critical capabilities and how to leverage them. In this context, supporting the leadership of the NATO Defence Planning Process is preferable to challenging it.

The U.S. Armed Forces and NATO European allies must fully leverage each nation's unique capabilities to seize the current window of opportunity to build a multinational force capable of MDO, with sufficient readiness, authority, interoperability, and force posture to effectively compete below the threshold of armed conflict, deter aggression, and, if necessary, prevail in open conflict should deterrence fail.

This work was supported by the Centre for Security and Military Strategic Studies from the project DZRO-CBVSS22-OZKON in 2025.

The author declares that there is no conflict of interest in connection with the publication of this article and that all ethical standards required by the publisher were accepted during its preparation.

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