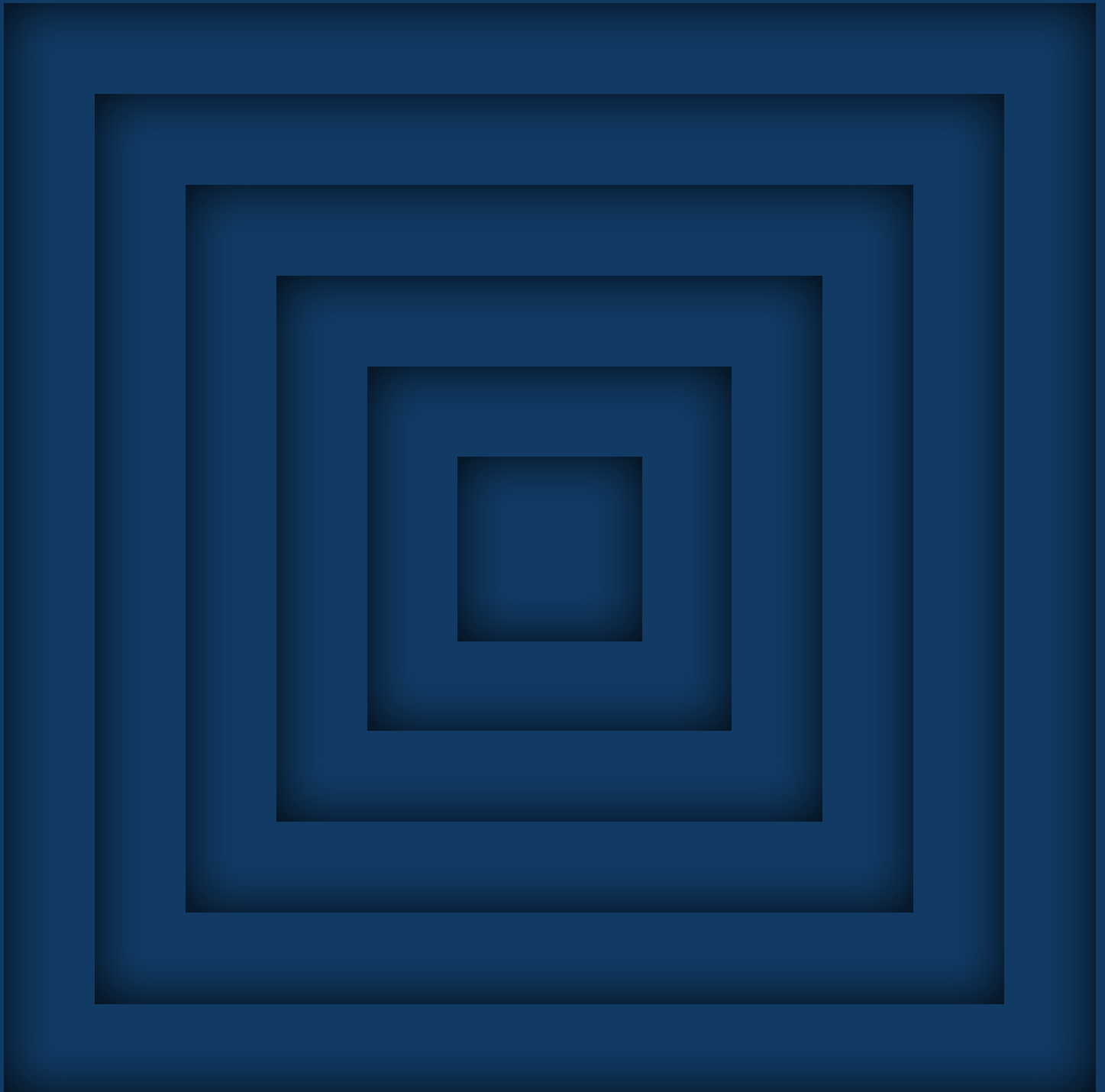




Multi-Domain Operations: Passing the Torch

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Tracing the intellectual journey of an operational concept is slippery stuff—and the development of Multi-Domain Operations (MDO) is no different.¹ In military concepts today, an idea is often not the product of “great thinkers,” but rather the result of several groups perceiving similar things at the same time united around a catalyst to act. The early origins of MDO was a reflection of multiple interacting dialogues within the Army, among the services, and with civilian defense leaders. In this swirl of ideas, MDO gained traction due to support from a critical mass of two stakeholders: senior Army military and civilian leadership. Contingency also played a role. Russia’s invasion of Crimea was a bracing catalyst that spurred ‘reframing’ of thinking and urgency within Army and DoD bureaucracy.

Eventually a concept runs out of runway in terms of what basic white-boarding and big ideas will achieve.² Blitzkrieg, airborne and heliborne operations, AirLand Battle, counter-insurgency (COIN), and now MDO, all met with realities—budget constraints, organizational limitations, and practical experiences—that significantly refashioned the initial concept. In the case of AirLand Battle, this refashioning occurred through years of rigorous, realistic training. More often in history, it is spurred by battlefield encounters. MDO has the opportunity to benefit from both as it begins being practiced by a U.S. Army that is also closely studying the Russo-Ukrainian War. By the end of the journey, the concept’s final manifestation and success depends as much on the unsung “doers” who operationalize it as it does to the initial “visionaries” who sketch it.

The origins of Multi-Domain Operations

MDO arose in the mid-2010s as the convergence of several threads. The U.S. Army’s conceptual thinking at the time, reemerging after a decade of counter-insurgency, recognized the growing potential of enemy capabilities to overmatch Army and joint capabilities.³ U.S. Army thinking also hypothesized that combined arms maneuver should now include additional domains, such as space, cyberspace, and maritime. At the U.S. Army’s Training and Doctrine Command, this loose set of ideas was called “Multi-Domain Battle.” What was missing, however, was a stark appreciation of how much adversary anti-access/area-denial (A2AD) capabilities posed a serious problem for maneuver at every level of war: tactical battle drills, operational schemes, intra-theater movements, and cross-oceanic strategic deployments.

Russia’s invasion of Crimea in 2014 shocked DoD thinking on many levels. Slowly it dawned on the U.S. defense establishment that the threat of ground invasion by an advanced military enemy seemed not only plausible, but also undefendable. In a series of studies of the Russian military machine, U.S. Army understanding grew about several operational problems that needed solutions, but would not be easily solved.⁴ Russian capabilities in range and lethality undermined U.S. doctrine predisposed to operational maneuver: “formations seen in any domain or waveform can be hit, destroyed, disrupted, or manipulated.” The implications

1 Many thanks to the reviews and insights from J.P. Clark, Edwin Werkheiser, Frank Hoffman, and John Jackson for their feedback and insights. Clark and Werkheiser were key contributors to early drafts of MDO.

2 Many thanks to JP Clark for making this point.

3 U.S. Army Training and Doctrine Command, TRADOC Pamphlet 525-3-1, *The U.S. Army Operating Concept: Win in a Complex World, 2020-2040* (7 Oct 2014).

4 Peter L. Jones, Ricky Waddell, Wilson C. Blythe, Thomas Pappas, “U.S. Army Training and Doctrine Command Russian: New Generation Warfare Study,” Unclassified summary, AD118626, (U.S. Army TRADOC Future Operations Center, Fort Lee, VA: June 1, 2017), <https://apps.dtic.mil/sti/pdfs/AD118626.pdf>, accessed Aug 26, 2023, 5.

were stark: the U.S. Army's ability to "close with the enemy"—gain close contact, destroy the enemy, secure terrain, and consolidate control—was at risk.

Civilian defense leadership support for reform was perhaps just as important in this early period. Deputy Secretary of Defense Robert Work and a cohort of defense intellectuals had been waging the "Third Offset Strategy" effort to reenergize Department thinking for more than a year. In Work's original description, the Third Offset Strategy was aimed at new technologies, organizational constructs, and operational concepts to fight future adversaries—particularly in the Western Pacific. To an Army still burdened with continuing stability operations in the Middle East and Africa, the Third Offset Strategy had an undeniable techno-centric "revolution in military affairs" (RMA) flavor that unsettled Army leadership.

By 2015, both sides saw potential in each other's efforts.⁵ Work, who had previously focused almost solely on the China threat, turned DoD attention to a now revealed Russian threat. In a 2015 speech to the U.S. Army War College in Root Hall (named for a previous early 20th century civilian defense reformer of the Army, Elihu Root), Work argued that the Joint Force and the Army were underestimating the impact of a non-linear battlefield swept by ubiquitous sensors, precision guided munitions, and effective cyber and electronic warfare attacks. He then gave the following charge to rising Army colonels and generals: "So what does AirLand Battle 2.0 look like? I don't know. The Army needs to figure this out."⁶

Even as Work urged on the Army, its concepts writing bodies were already embarked on an intellectual journey that would go from white paper, to concept paper, to official concept, to doctrine. Along the way, the name changed from "Multi-Domain Battle" to "Multi-Domain Operations," in some part to escape the idea that the concept was merely AirLand Battle 2.0 and also as a nod to Air Force preferences.⁷

However, there were much more substantive developments than just name changes. One of these changes was a new set of modernization priorities, backed by billions of dollars of money reallocated in internal Army budget 'night courts' between 2017 and 2019 that culled under-performing or ancillary programs. Another change was the creation of U.S. Army Futures Command (AFC) to reinvigorate technological experimentation, concept innovation, and the all-important path from technological demonstration to programs. These changes reflected a sense that the Army had 'lost a march' on its potential adversaries, due as much to its own bureaucratic ossification as adversary developments. Making MDO a reality required the Army to change the capabilities it bought and how the Army developed those capabilities. And, in the American defense system, institutional reforms of this magnitude were only possible through the combined efforts of senior Army military and civilian leadership. Consecutive service secretaries and chiefs spent political capital, made hard decisions, found resources, and closely overwatched implementation—the unglamorous but essential tasks needed to gain the support of Pentagon leadership and Congress.⁸

5 Kelly McCoy, "The Road to Multi-Domain Battle: An Origin Story," *Modern War Institute* (blog), October 27, 2017, <https://mwi.westpoint.edu/road-multi-domain-battle-origin-story/>, accessed Aug 26, 2023.

6 Robert Work, "Speech delivered at the Army War College Strategy Conference," U.S. Army War College, Carlisle, PA, Apr 8, 2015, <https://www.defense.gov/News/Speeches/Speech/Article/606661/army-war-college-strategy-conference/>, accessed Aug 26, 2023.

7 Scott King and Dennis B. Boykin IV, "Distinctly Different Doctrine: Why Multi Domain Operations Isn't AirLand Battle 2.0," Association for the United States Army, Feb 20, 2019, <https://www.usa.org/articles/distinctly-different-doctrine-why-multi-domain-operations-isn%E2%80%99t-airland-battle-20>, accessed Aug 26, 2023.

8 Secretaries Mark Esper, Ryan McCarthy, and Christine Wormuth and Generals Mark Milley and James McConville provided continuity for MDO from 2017 to 2023.

Institutional reforms can set the conditions for the flourishing of new ideas. But, what are MDO's ideas? Today, the central idea of Multi-Domain Operations is the “combined arms employment of joint and Army capabilities to *create and exploit relative advantages* that achieve objectives, defeat enemy forces, and consolidate gains...”⁹ Relative advantage is “a location or condition, in any domain, relative to an adversary or enemy that provides an opportunity to progress...”¹⁰ The doctrine recognizes five domains—land, maritime, air, space, and cyberspace. Additionally, each domain has three dimensions: physical (force elements, physical effects), information (relevant data, knowledge), and human (morale, will, cognition).¹¹ Much emphasis is placed on “fractur[ing] the coherence of threat operational approaches by destroying, dislocating, isolating, and disintegrating their independent systems and formations, and exploiting the opportunities these disruptions provide to defeat enemy forces in detail.”¹² MDO is particularly focused on addressing enemy layered standoff capabilities (“integrated fires complexes and air defense systems”) so that “maneuver forces can exploit the resulting freedom of action.”¹³ MDO presents an operational approach focused on creating “windows of opportunity” for maneuver by the Joint Force, and especially ground forces.

It is worth pausing for a historical detour to place MDO in the context of American defense thinking of the last four decades. Being an official service idea, MDO often seeks to weave (or perhaps straddle) several lines of thinking. In one sense, MDO is simply an expansion of 1980s AirLand Battle ideas of an “extended battlefield” to one that now includes maritime, cyber, and space domains in a much more reciprocally integrated fashion. And, “convergence” could be seen as a restatement of the AirLand Battle idea of synchronization, which emphasized the “arrangement of battlefield activities in time, space, and purpose” at the decisive points of an operation.¹⁴ Both these points continue long-standing U.S. Army pursuit of more, and better, jointness, which from a more parochial Army perspective often means more integrated Air Force and Navy support of (or implicitly subordination to) ground operations. However, what is new is an Army assertion that ground forces can make its own contributions to air and maritime campaigns through the use of long-range fires for air defense suppression and maritime interdiction. While there is much to suggest such cross-domain potential, it should not be forgotten that MDO is also an argument for the continued relevance of ground forces.

In another sense, MDO can also be seen as being possessed by the ghosts of 1980s maneuver warfare thinking, with its incumbent disdain for attritional warfare. In the 1980s, defense thinkers such as John Boyd and William Lind advocated pursuing a war of movement and “out-positioning” the opponent as the true art of war. Their central idea was to destroy the opponent’s moral and cognitive cohesion by moving through repeated turns of the observe-orient-decide-act (OODA) faster than the opponent.¹⁵ Similarly, MDO today incessantly advises the pursuit of “positions of advantage” through superior “decision advantage” to create “multiple dilemmas for the enemy.” However dissatisfying for an operations doctrine, MDO provides few cogent examples of what these terms practically mean for unit operations and tactics.

9 Headquarters, Department of the Army, *FM 3-0: Operations*, (Headquarters, Department of the Army, Washington, DC: October 2022), 1-2.

10 FM 3-0, 1-3.

11 FM 3-0, 1-17 to 1-23.

12 FM 3-0, 1-3.

13 FM 3-0, ix.

14 Headquarters, Department of the Army, *FM 100-5: Operations*, (Headquarters, Department of the Army, Washington, DC: 1986), p.17.

15 Antulio J. Echevarria, *War's Logic: Strategic Thought and the American Way of War*, (New York: Cambridge University Press, 2021), 181-2.

Like the writings of maneuver warfare theorists in the 1980s, MDO can seem disconcertingly silent on Jominian first principles regarding supplies, lines of communication, and advanced bases.¹⁶ Does maneuver drive logistics or logistics drive maneuver? And, what are the enemy flanks that can be realistically exploited? An example of how these ideas *could* be tangibly described can be found in Basil Liddell-Hart's biography of General William Tecumseh Sherman.¹⁷ Liddell-Hart describes how time and again Sherman maneuvered his forces to threaten two objectives at once and keep the enemy uncertain about which path to defend. And, Liddell-Hart shows how Sherman's manipulation of enemy anxieties about lines of communication, available supplies, operational consumption, and political expectations were fundamental calculations for maneuver success. But, in today's context, MDO writings offer few examples so cogent or practical.

The purpose of recounting MDO's ideational milieu is that any particular warfighting concept does not exist in a vacuum. It can be as much an interpretation of the past as it is a prediction of the future. Understanding the assumptions and logics of its historical interpretation is useful for critiquing the concept and understanding what to do next. A warfighting concept is never static, although sometimes the proclamation of a concept as doctrine causes some to argue that the debate is over. But, for our purposes, let's assume that MDO is an unfinished idea that will become reality only if institutions build the actual force elements with the equipment and training needed to execute its ideas. So, for the second half of the essay, let's turn to the future for MDO, and what its next ideas might be.

The Russo-Ukrainian War: The Problematik in Action

Regarding next steps for MDO, the Russo-Ukrainian War has been especially illuminating. One of course should start with a few caveats and cautions. First, while both belligerents are attempting combined arms operations, neither is fighting truly integrated multi-domain operations. The aviation capabilities—fixed-wing and rotary-wing—of both adversaries, but Ukraine in particular, are not the same as those of the United States, the combined capabilities of NATO, or China. Russia and Ukraine also lack the higher echelon training and cross-domain coordination capabilities that the American military enjoys. Second, as Brent Stirling has pointed out, discerning and distilling lessons from another war has potential pitfalls we should keep in mind, including: biasing preexisting preferences, failing to sustain support for a valuable lesson due to bureaucratic crosswinds, and ignoring the potential for adversaries to adapt from the same cues.¹⁸

Nonetheless, the Russo-Ukrainian War suggests four key points regarding evolving patterns in the character of warfare between two strongly resolved, large-scale, modern militaries. First, synchronizing combined arms, now at the multi-domain level, remains difficult and hardly eased by the abundance of communication paths and apps. Combined arms synchronization doesn't have to be perfect (holding out for perfect synchronization would likely be self-defeating), but it has to be good enough. Both Russia and Ukraine have struggled to synchronize combined arms, and have found their maneuver forces stacked up impotently

¹⁶ Echevarria, *War's Logic*, 182.

¹⁷ Basil Liddell-Hart, *Sherman: Soldier, Realist, American*, (Boston: Dodd, Mead, and Co., 1929).

¹⁸ Brent L. Sterling, *Other People's Wars: The U.S. Military and the Challenge of Learning from Foreign Conflicts*, (Washington DC: Georgetown University Press, 2021), p.273-80.

in vulnerable situations.¹⁹ Key enemy battlefield operating systems—fires/counter-fires, air defense, communications and electromagnetic spectrum warfare, and sustainment—must be suppressed, disrupted, dislocated, or degraded before maneuver can occur—or else the enemy can mercilessly exploit gaping holes in the friendly force’s “protection” shield. Second, the range, sensor capabilities, connectedness, and lethality of these battlefield operating systems makes dispersion essential for survivability, but also possible. Both Russia and Ukraine have been forced to practice techniques of camouflage, cover, concealment, deception, and denial (C3D2) for their tactical assembly areas, logistics depots, and command posts that are dozens of kilometers behind the front lines. For MDO, the result is the continuing centuries old trend toward an extended, non-contiguous battlefield with deep zones of combat.²⁰

Third, Russia and Ukraine have found that the ability to advance forward or hold a piece of ground today is often determined by the balance of advantage between competing battlefield operating systems.²¹ Tactics, in their purest form, is the application of technology on the battlefield. In the past it was applying technologies of firepower and maneuver on terrain; today it includes the move/counter-move competitions in electronic warfare, air defense, and counter-battery fire. Finally, both Russia and Ukraine have demonstrated that logistics is the foundation for operational success. Warfare between two modern militaries retains fearsomely high levels of munitions consumption.²² For MDO, mass still matters. MDO mass comes from large numbers of artillery rounds, anti-tank guided missiles, ground-launched rockets, precision-guided missiles, and now unmanned autonomous systems—small and large.²³ A significant stockpile of war consumables is crucial for ensuring operational options, momentum, and endurance. MDO logistics requires capabilities, coordination, and sufficiency across the national, operational, and tactical levels. In sum, adaptation battles and logistics aim for cumulative or attritional effects that create the conditions for maneuver through enemy exhaustion, rather than shock—which is an idea that differs from MDO’s current emphasis on creating “windows of opportunity.”

19 The analysis of Jack Watling and Nick Reynolds on battlefield developments in the Russo-Ukrainian War is superb. Jack Watling and Nick Reynolds, “Stormbreak: Fighting Through Russian Defences in Ukraine’s 2023 Offensive,” *Royal United Services Institute*, Sep 4, 2023. See also Jack Watling and Nick Reynolds, “Meatgrinder: Russian Tactics in the Second Year of its Invasion of Ukraine,” *Royal United Services Institute*, May 19, 2023. See also Mykhaylo Zabrodnyi, Jack Watling, Olesandr V Danylyuk, and Nick Reynolds, “Preliminary Lessons in Conventional Warfighting from Russia’s Ukraine: February-July 2022,” *Royal United Services Institute*, Nov 30 2022.

20 Randy Nooman, “The Russian Way of War in Ukraine: A Military Approach Nine Decades in the Making,” *Modern Warfare Institute* (blog), June 15, 2023, <https://mwi.usma.edu/the-russian-way-of-war-in-ukraine-a-military-approach-nine-decades-in-the-making/>, accessed Aug 29, 2023.

21 Mick Ryan, “The State of the Ukrainian 2023 Campaign,” *Futura Doctrina* (blog), Aug 2, 2023, <https://mickryan.substack.com/p/the-state-of-the-ukrainian-2023-campaign#:~:text=The%20Ukrainians%20did%20not%20achieve,Russian%20headquarters%2C%20logistics%20and%20artillery>, accessed Aug 29, 2023. See also Stephen Biddle, “Back in the Trenches,” *Foreign Affairs*, August 10, 2023, <https://www.foreignaffairs.com/ukraine/back-trenches-technology-warfare>.

22 This lesson has been underestimated time and again over the last 125 years, particularly in the First World War and the Yom Kippur War.

23 Ryan, “The State of the Ukrainian 2023 Campaign.”

Next steps for Multi-Domain Operations

These four factors—combined arms synchronization, dispersion and concealment, adaptation battles, and logistics sufficiency—act in natural tension with each other. They have important implications for the next steps of MDO as a concept—particularly for its inner workings. Much refinement still lies ahead in *how* a multi-domain force arrays missions and capabilities across its echelons, which is the start point for effective synchronization. The recent co-authored essay from the commander of Army Futures Command and the Army G-2 provides the clearest sketch so far of how the U.S. Army envisions structuring battlespace responsibilities.²⁴ In this vision, theater armies shape the deep rear through orchestrating security assistance and sustainment support, as well as shape the deep forward through pattern of life characterization of the information, cyber, electromagnetic environment, and operational environment. Corps are the primary echelon responsible for “deep battle”—attacking the battlefield operational systems that are essential to modern warfighting—and synchronizing multi-domain effects. And, divisions synchronize the myriad capabilities needed to make brigade combat team maneuver successful: reinforcing fires, counter-battery in the close area, medium and short-range air defense, major gap crossing, counter-mobility obstacle belt development, and electromagnetic spectrum warfare.

With these revived echelon requirements, the U.S. Army is revamping its division artillery, division engineers, division air defenses, corps fires, and electronic warfare elements. These formations unwind the flattening of combat support capabilities that occurred during the two decade post-Cold War era of stability and counterinsurgency operations. However, the creation of theater fires elements also adapts to the new potential of long-range precision fires to strike at distances or environments that were previously the purview of other domains. An open question remains whether a ground long-range strike complex needs to be self-contained within its own unit (“Multi-Domain Task Force”) or organically incorporated into corps-level and theater-level fires. The other looming force array question for MDO is how to task organize capabilities for littoral operations? While the Marine Littoral Regiment provides one answer, it does not provide a solution of sufficient scale for even a single area of operations, such as in the South China Sea, much less an Indo-Pacific theater of war.

For a concept that emphasizes the reinvigorated role for corps and divisions, orchestrating the deep battle is an area that needs more rigorous thinking. Early reports from MDO-era command post training events indicate that corps and division staffs struggle to prioritize their efforts.²⁵ Instead, the deep battle risks becoming a prioritized laundry list of targets to be serviced, without careful thinking of what is trying to be achieved in time and space. In this regard, the U.S. joint force could perhaps borrow from Chinese “systems” warfare.²⁶ What combinations of fires and effects across time and space will neutralize enemy battlefield operating systems for fires, air defense, and logistics? Ultimately, the deep fight is inherently joint. In both sensors and shooters, the Army can bring more to the table than in the past, but all of

24 James Rainey and Laura Potter, “Delivering the Army of 2030,” *War on the Rocks* (blog), Aug 6, 2023, <https://warontherocks.com/2023/08/delivering-the-army-of-2030/>, accessed Aug 29, 2023.

25 David M. Spangenberg, “The Deep Area: Misconceptions and Challenges,” No. 22-701, March 2022, <https://api.army.mil/e2/c/downloads/2023/01/31/47a47b66/18195.pdf>, accessed Aug 26, 2023. See also Center Center for Army Lessons Learned, “Deep Operations Reference Catalog,” No. 21-607, July 2021, <https://api.army.mil/e2/c/downloads/2023/01/31/a23282fc/21-607-deep-operations-catalog-public.pdf>, accessed Aug 26, 2023, p. 2-4.

26 Such appropriation would not be unusual; over time AirLand Battle appropriated several ideas from Soviet concepts regarding the operational maneuver group and reconnaissance strike complex. It can also be seen as an idea that harkens back to AirLand Battle’s original idea of eight “battlefield operating systems” that was lost when the terminology became the more anodyne term “warfighting function.”

the solutions will be joint to some degree and require joint collaboration. How the Army should integrate with deep fires at the theater level has yet to be resolved.

Beyond the theater-level deep fight, the Army has its own deep fight closer in that will consume its attention. With the extended ranges and capabilities of sensing and strike, divisions and corps must now isolate enemy close combat area units from the supporting warfighting systems and/or that support the enemy's scheme of maneuver—fires, logistics, electronic warfare, reconnaissance-surveillance, command and control. The Russo-Ukrainian war has shown that figuring out how to break through well-prepared defenses in depth supported by indirect fires and mobile reserves—not just tanks, but also attack rotary-wing aviation reserves—is a costly, and time-consuming endeavor that depends primarily on combined arms by echelons above tactical brigades.

But, the deep fight is not solely a US or NATO advantage. Adversaries now have their own powerful and lethal reconnaissance-strike complexes creating new dynamics between dispersion and concentration for Multi-Domain Operations. First, not only close combat units must disperse, but also command posts, firing batteries, aviation forces, supply stockpiles, and follow-on reserves. The battlespace will increasingly constitute zones of combat that extend in depth at least dozens of kilometers. Battlefield geometry will be dynamic, even in the rear, with constant attention required to coordinate how echelon-above-brigade systems (EW, air defense, counter-fires) are moving. Second, the sustainment ecosystems to support dispersed, high operational tempo formations in deep zones of combat need deeper examination. How sustainment elements are echeloned across hierarchies and geography will likely need to change. Resiliency, redundancy, and multiple supply options may gain favor over dedicated unit supply trains.

These systems fights will involve “adaptation battles” that will ebb and flow through measure/counter-measure/counter-counter measure cycles of competition.²⁷ Philosophical tactical principles will be enduring, but techniques and procedures—technical methods and small unit practices—for their execution will likely have to adapt repeatedly in a never-ending race to gain an advantage in technological exploitation, systems employment, or tactics.²⁸ These are systems/counter-systems fights between specific networks, sensor-executor links, and sub-units across echelons. Adaptation battles will be a key pillar of tactics of an MDO force, and MDO as a body of concepts needs to do more to set the practical conditions for their manifestation. Adaptation does not just happen through encouragement. It is most effective when it is given parameters in advance for “free-play” and then aggressively pulled from the ranks into identified channels of discussion, validation, and dissemination for the entire force. Think GitHub, not CALL (Center for Army Lessons Learned).

Perhaps the area where adaptation is occurring most quickly is in the proliferation of unmanned autonomous systems (UAS) at every level and practically every battlefield operating system.²⁹ This is the sort of adaptation competition that places a premium on finding the right mix of modular, upgradable, and high-end systems combined with cheap platforms that can undergo attrition. In an encouraging trend, the U.S. Army is increasingly supporting experimentation and adaptation in small UAS. But, watching how quickly dynamics are changing in Ukraine with constellations of UAS now operating in front of the FLOT, one wonders: is the U.S. Army is moving fast enough?

27 Ryan, “The State of the Ukrainian 2023 Campaign: Progress and Challenges.”

28 Biddle, “Back in the Trenches.”

29 Recent U.S. Army Chief of Staff, General James McConville has made this point repeatedly in public statements and Congressional testimony.

One final key implication for Multi-Domain Operations will be how to conduct integrated *tactical* combat operations with multi-national alliance formations.³⁰ The experiences of Ukrainian forces have reiterated the challenges of stitching together formations with different equipment sets, communication systems, and task organizations. But, what does this mean for MDO? For America, the trend is towards coalition warfare with a level of tactical integration far beyond the Cold War era of national corps. Once again, the Ukrainian example shows what is possible. The key is having the right apps to connect them, an effective logistics system for them, and a commonly understood method of employment.³¹

From a U.S. Army and NATO perspective, the challenge of MDO-level integration stands out. In the future, there will be an even greater premium for communications and data interoperability at the tactical level, since most NATO corps and divisions will be multi-national. NATO ground forces may have to be more tactically integrated among national forces than the U.S. joint force will have to be tactically integrated among services. Second, NATO corps today lack the multi-domain enablers needed to both shape the deep area and protect the friendly close-combat area. How NATO countries will generate and lash together these multi-domain enablers is a huge uncertainty over NATO warfighting.³² NATO and its members face several hard choices.³³ What is the requirement for MDO capabilities? How should NATO integrate and who will buy and maintain echelon above brigade capabilities? How will NATO practice to build readiness and demonstrate capacity/capability?

This leads us to the concluding point about Multi-Domain Operations. The Russo-Ukrainian War has shown that it is not enough to possess ISR, EW, UAS, space networks, and long-range strike capabilities. They must also be well-maintained, with well-trained crews, well-practiced tactics, and well-integrated with other formations. And, these capabilities can still be stymied by defenses in depth. Even with all MDO's discussion of new cross-domain capabilities and kill chains, the solution is the same as it ever was: well-practiced and coordinated combined arms operations with sustainable logistics mass that strike the right balance between caution and aggressive action. And, like AirLand Battle in the 1980s, Multi-Domain Operations will only be "operationalized" into a winning warfighting concept at the micro-level by the sweat, hard training, and rigorous after action processes of crews, companies, battalions, and staff echelons. The real MDO will be hammered out by the doers of the concept in the woods, hills, desert, swamps, and urban mock-up villages of training centers. Just as important will be the wargames, command post exercises, and echelon-above-brigade maneuvers that test how these ideas scale up to the operational level. Thus, the torch of MDO has passed from the thinkers to the implementers and the doers.

30 A military's warfighting concept should ultimately be the servant of national strategy, and a consistent thread of U.S. grand strategy over several administrations has been an emphasis on the strategic advantages gained from fighting with allies and partners.

31 Christopher G. Pernin, Jakub P. Hlavka, Matthew E. Boyer, John Gordon IV, Michael Lerario, Jan Osburg, Michael Shurkin, and Daniel C. Gibson, *Targeted Interoperability: A New Imperative for Multinational Operations*, (Santa Monica, CA: RAND Corporation, 2019). https://www.rand.org/pubs/research_reports/RR2075.html.

32 Jack Watling and Sean MacFarland, "The Future of the NATO Corps," RUSI Occasional Paper, Royal United Services Institute, January 2021. See also Andreas Marlow and Wilson Blythe, "Multi-Domain Warfighting in NATO: The 1 German-Netherlands Corps View," *Military Review* May-June 2022, 16-27.

33 Many thanks to Edwin Werkheiser for these insights.



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