Getting Multi-Domain Operations Right

Two Critical Flaws in the U.S. Army's Multi-Domain Operations Concept

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U.S. Army Major Amos C. Fox is the executive officer for 3rd Squadron, 4th Security Force Assistance Brigade at Fort Carson, Colorado. He previously served with the 1st Armored Division, 11th Armored Cavalry Regiment and 4th Infantry Division and at the U.S. Army Armor School. He is a graduate from the U.S. Army's School of Advanced Military Studies at Fort Leavenworth, Kansas, where he was awarded the Tom Felts Leadership Award in 2017.

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Inquiries regarding this and future Land Warfare Papers should be directed to: Nzinga A. Curry, Director, Education & Programs, 2425 Wilson Boulevard, Arlington, VA 22201, email ncurry@ausa.org or telephone 703-907-2636.

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Introduction

The U.S. Army must be lauded for its effort to develop a doctrine to address the technological innovations of the 21st century and the associated threat environment. Throughout the Cold War, Active Defense and AirLand Battle served the U.S. Army well as it looked to fight and win in the face of Soviet deep operations doctrine. But today, Multi-Domain Operations (MDO), outlined in Training and Doctrine Command (TRADOC) Pamphlet 525-3-1, *The U.S. Army in Multi-Domain Operations 2028*, serves as the U.S. Army's starting point for addressing the threats of tomorrow.

Despite this positive first step, the U.S. Army's MDO concept still has two critical flaws. First, given the weight that TRADOC places on dominance within its MDO concept, it is insufficiently described and applied. Analyzing this flaw yields a concept and an application of dominance, or an idea called *Zones of Proximal Dominance* (ZoPD), that can contribute to MDO's usefulness. Second, MDO's insistence on persistence and convergence, underwritten by an assumption that was proven false in the campaigns to counter the Islamic State, fails to adequately account for hard constraints and frontage problems on the corps and field army level. This flaw must be addressed, or the concept becomes infeasible. Further, the results of examining these two flaws lead to certain implications that should also be incorporated into the MDO concept.

These flaws are not discussed to cause a ruckus and to point a finger at the people developing this doctrine, but rather to generate further MDO discussion and refinement; as American strategic theorist J.C. Wylie posits, narrow strategic theories and corresponding doctrines inhibit success in an adversarial environment.[1] He contends that theories and doctrine should possess the conceptual breadth to make them truly useful; that is the purpose of bringing these flaws forward—to help make MDO more useful.[2]

Dominance

As stated above, the first flaw is an insufficient description and application of dominance within the MDO concept, especially considering how much weight TRADOC places on it.

First, TRADOC Pamphlet 525-3-1 states that dominance is one of the four emerging trends shaping the emerging operational environment.[3] It goes on to state specifically that U.S. dominance in emerging operational environments is *not* assured, but then insufficiently elaborates on the impact that dominance plays within MDO.[4]

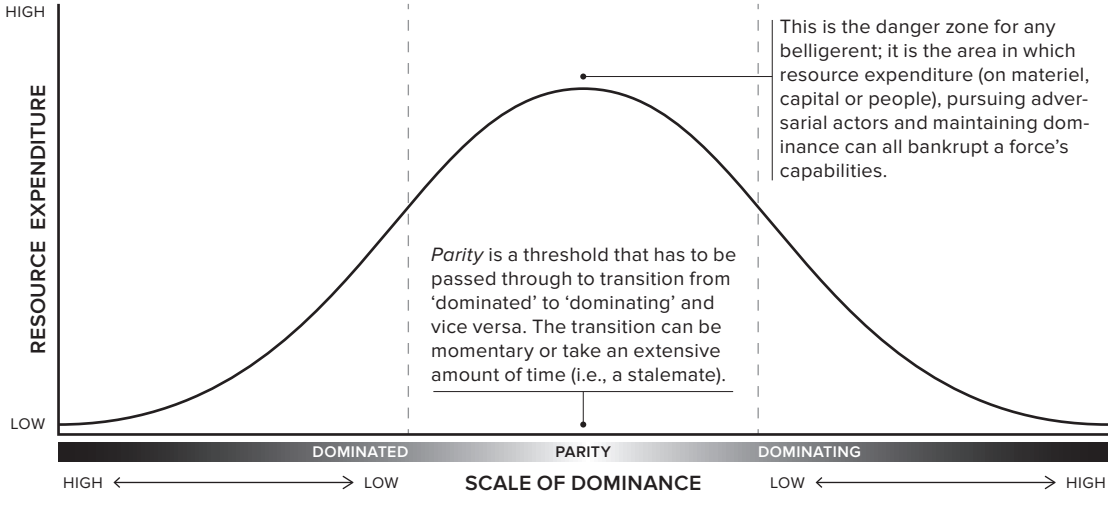
To account for dominance, MDO should begin with several first-order questions, including but not limited to the following. What is the character of dominance? How is dominance measured? What are the modulating features of dominance? And, can a simple model help to express dominance?

The Character of Dominance

Dominance is conditional, meaning that it requires resource stabilization plus resource overmatch vis-à-vis the enemy for a period sufficient to either force an enemy to change their plan or to acquiesce. In that respect, dominance is fleeting, fragile and prone to shock and surprise. Hence, a proportional relationship exists between resource expenditure and the ability to secure or preserve dominance; that is, the greater one's expenditure in resources, the less likely it is that they can achieve and maintain dominance relative to their opponent (see Figure 1).

Figure 1

Scale of Relative Dominance



Measuring Dominance

Dominance, being resource-dependent, is measurable and can be forecasted by zones, degrees and duration. This taxonomy is useful for assessing and anticipating both friendly and enemy dominance. To be sure, those metrics can assist in forecasting when, where and for how long an actor may—or may not—possess dominance or be capable of persistence in each domain or across multiple domains (see Figure 2).

Modulating Features

Because of resource interdependence, anything an actor does to degrade or disrupt an opponent's resources tempers its ability to perpetuate dominance at a specific point in both time and space. This endeavor includes not only those actions directed at disrupting enemies'

resources, but also anything that expends that actor's own resources in ways for which it was not prepared.

For instance, an actor might launch a preemptive or spoiling attack to catch an opponent off-balance, disrupting its bid to grab dominance. Alternatively, an actor might strike indirectly, attacking shaping efforts or a flank to cause an opponent to divert resources and attention from its main effort, hence disrupting the pursuit of dominance. Further, premeditated attritive battles that are not allowed to quickly conclude deplete an opponent's stocks, decreasing its capacity to obtain or retain dominance.

Figure 2

An Overview of Dominance

Dominance is inherently tied to: 1. Resources; 2. time or duration; 3. enemy contact; and 4. self-sustainment.	**Dominance, an equation:** $D = (Re + Ti) \div (En + Su)$
Dominance is measured in: 1. Zones (close to far, multiple domain); 2. degrees (high, parity, low); and 3. duration (short to long).	**Dominance is:** 1. Fragile; 2. fleeting; and 3. prone to surprise.

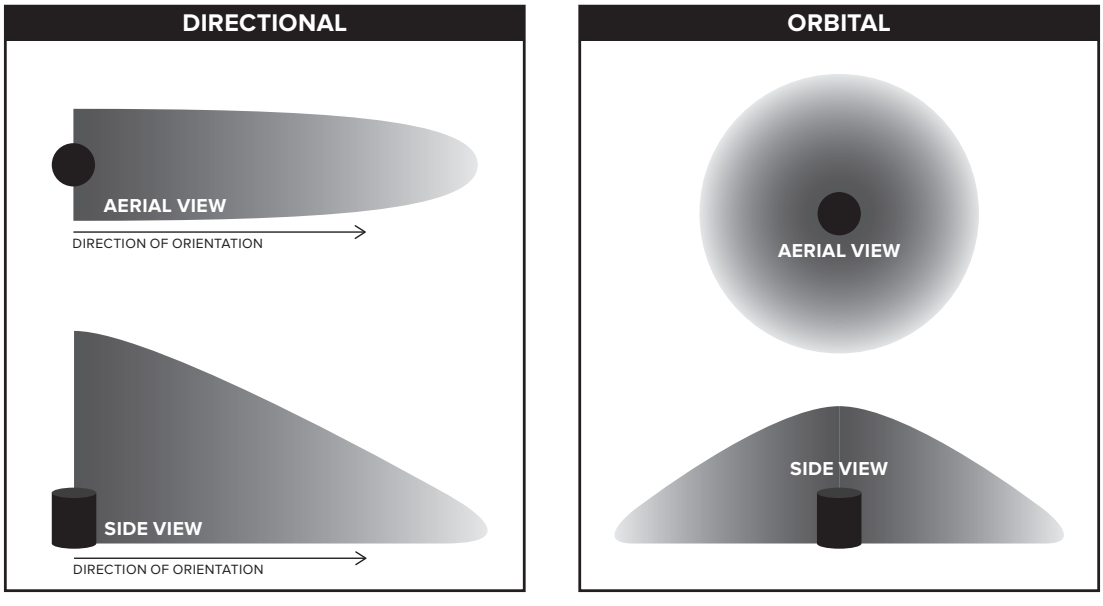
A Dominance Model

As an equation, dominance (*D*) equals one's resources (*Re*) plus time (*Ti*), divided by enemy action (*En*) plus self-sustainment (*Su*): $D = (Re + Ti) \div (En + Su)$.

Conceptually, dominance is applied through actualization—or ZoPD. This is built upon the premise that hard constraints (i.e., resources, manpower and time) curb an actor's realization of dominance and persistence. As a rule, dominance is localized within zones that radiate from a power source (see Figure 3). In technical terms, a power source is any formation in

Figure 3

Zones of Proximal Dominance



contact or that envisions contact with an adversary. For instance, in large-scale combat operations (LSCO), this could be a field army or an army group mustering resources to make headway against an enemy of relatively equal size and strength, akin to Lieutenant General Omar Bradley's First Army during World War II's Operation Cobra (25–31 July 1944; see Map 1).[5] It is important to note that a power source is not bound to just high-level headquarters or large formations. Power sources are found at any echelon where two or more belligerents come into contact or might encounter one another.

Power radiation is proportional to the power source's strength, the strength of the adversary and the ability of both to aptly replenish resources. Further, power radiation is situationally dependent and can be both omnidirectional or unidirectional, but it is most likely focused on adversarial forces. Moreover, ZoPD power radiation derives its level of mobility from its power source.

In ZoPD planning, options are often binary. A broad front results in wide coverage, but it induces fragility across the front because of limited power and resource redundancy. Further, a broad front results in limited operational reach because all (or most) power sources are pushed forward, reducing the ability to resupply, reinforce or generally react in response to adversarial contact. On the other hand, a scaled front with layered power sources increases the ability to offset shock and surprise, and it facilitates operational reach through resource conservation and redundancy.

In summary, applied dominance, or ZoPD, is a useful framework to assist in strategy development and planning at both the operational and tactical levels. By the same token, understanding the character of dominance and ZoPDs can help strategists and planners to frame the operational environment and develop stratagems to disorganize an enemy's grip on dominance. These concepts should be incorporated into MDO to add a layer of practicality to its suppositions about persistence, overmatch and convergence.

Hard Constraints and Frontage Problems

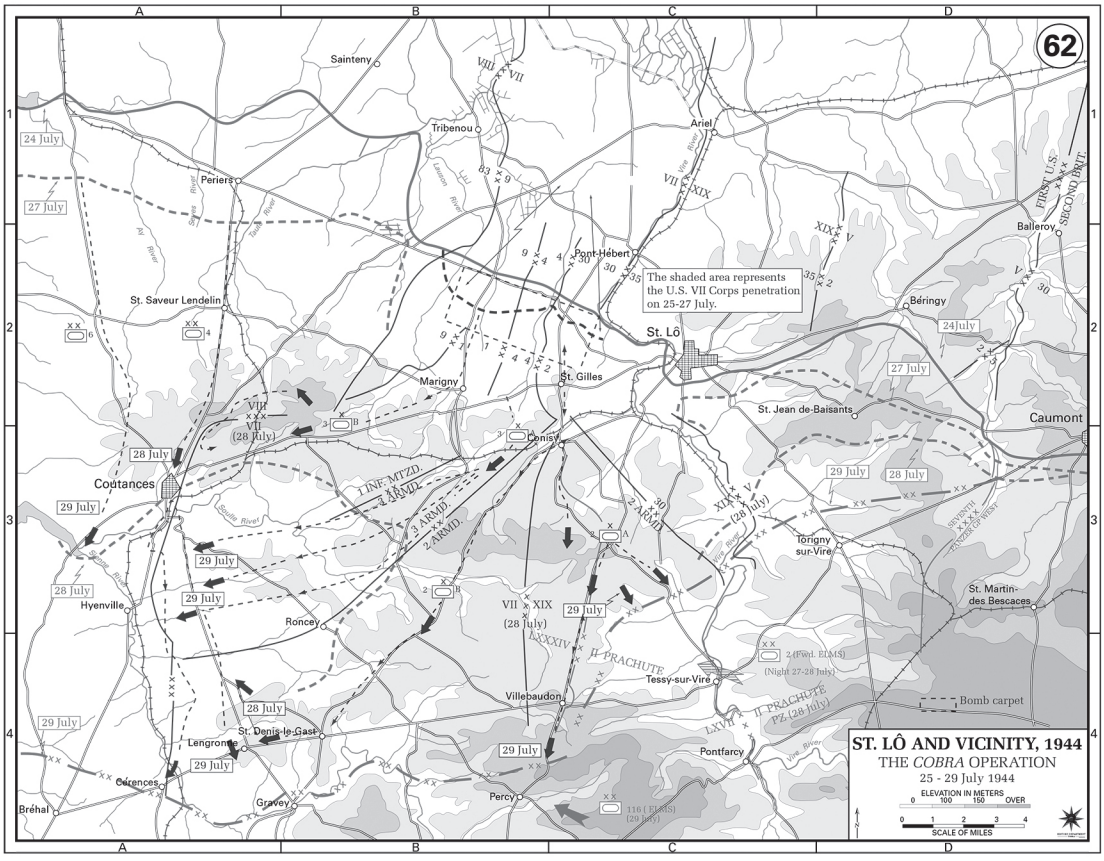
A second flaw with the current MDO concept, i.e., its unbalanced focus on persistence and convergence, fails to adequately consider hard constraints and the associated frontage problems.

Disintegrating an enemy's anti-access and area denial (A2/AD) system is a central tenet of TRADOC's MDO concept. "Persistence" is the animating verb used to describe how the U.S. Army and joint force look to accomplish this. MDO posits that persistent reconnaissance, surveillance, mid-range fires and long-range precision fires are key; it also assumes that the Army will have the resources required to meet the demands of the national defense strategy through 2040.[6] However, incorporating recent combat operations and the concept of dominance into the equation makes this assumption look suspect.

Operation Inherent Resolve (OIR) and similar missions rapidly depleted the U.S. military's stores of precision-guided munitions (PGMs).[7] Mosul, Marawi, Raqqa and some engagements in Africa combined to result in a sharp decline in both on-hand and stockpiled PGMs.[8] At Mosul's apex, the U.S. Army and joint force almost ran out of Hellfire missiles and other PGMs, requiring DoD to pursue special funding to help replenish its stocks.[9] Importantly, this occurred within a relatively short amount of time against small, light infantry-type forces, in a small number of locations. If the U.S. Army and joint force were instead engaged with the

Map 1

St. Lô and Vicinity: The Cobra Operation



Russians or Chinese, they would find the opposite—large, heavily armored forces holed up in many urban areas across a vast front. Given Russia's current position on eastern and central Europe, a brief example seems appropriate.

President of All Russias

In a hypothetical but plausible scenario, the Russian president, nodding to the Romanov Czars, creates the title, "President of All Russias." With historical precedence, he defines "All Russias" in the following manner:[10]

- Muscovy is Great Russia;
- Belorussia, or Belarus, is White Russia;
- Ukraine is Little Russia;
- Crimea (initially annexed by the Romanovs from the Crimean Khanate in 1783)[11] and southern Ukraine are New Russia; and
- Galacia (parts of modern-day southeastern Poland and portions of western Ukraine) is Red Russia.

He continues the territorial expansion that began in 2014 with the re-annexation of Crimea and de facto annexation of eastern Ukraine's Donetsk and Luhansk oblasts. Russia launches an assault from Pskov with the battle-hardened 76th Guards Air Assault Division moving toward Riga, Latvia, and Tallinn, Estonia.[12] However, having read the preponderance of RAND reporting since 2014, Russia launches this assault as a demonstration intended to lure American attention and resources toward the Baltics—and to freeze the U.S. Army's rotational units that are already there.

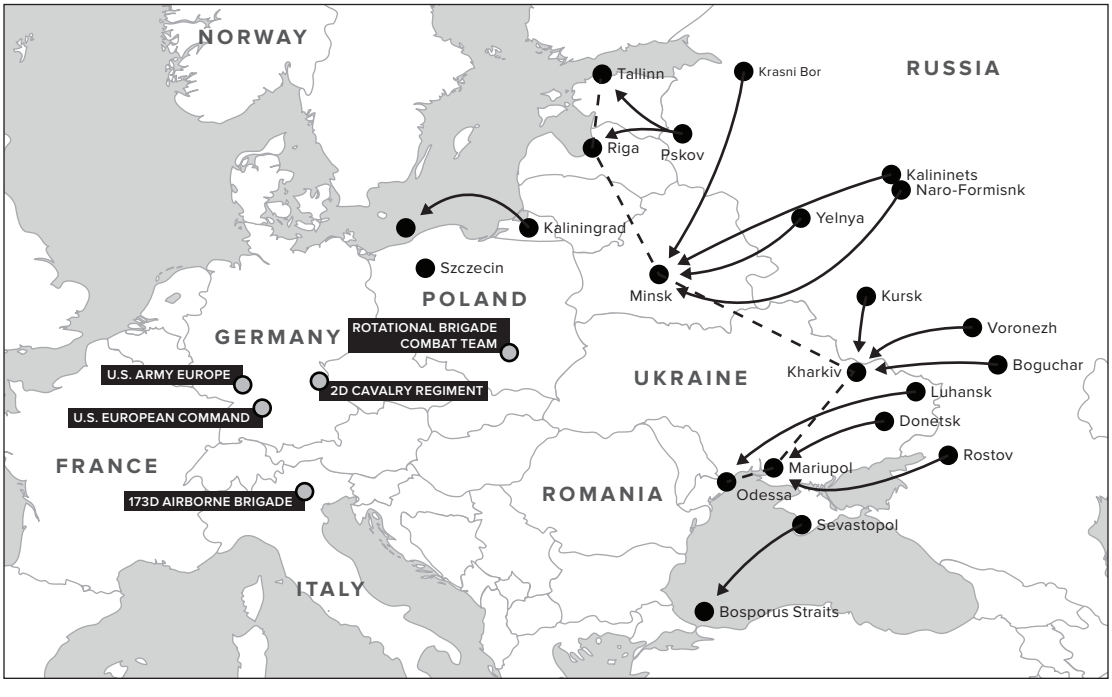
Simultaneously, Russia launches forces from the 20th Combined Arms Army located at Yelnya, Boguchar, and at Kursk toward Kharkiv. The 1st Guards Tank Army, with forces at Kalininets, Krasni Bor and Naro-Forminsk moves toward Minsk. Concurrently, the Russian Southern Military Districts forces in the Donbas, in conjunction with their proxy armies in Donetsk and Luhansk, expeditiously move to seize control of Mariupol and Odessa, something they failed to do in 2014, aiming to protect Crimea's northern flank and so to gain control of New Russia.

At the same time, the Russian Baltic Fleet sails from Kaliningrad and establishes a Baltic blockade that runs from just north of Szczecin, Poland, to Finland's southern coast to increase its ZoPD in the Baltic region and to deny free naval passage to Polish ports along the Baltic coast. Further, the Black Sea Fleet launches combat elements from Sevastopol to block the Bosporus Straits, protecting Russia's southern flank and extending its southern ZoPD (Figure 4).

Assuming that U.S. forces are able to react quickly enough to establish a foothold in Europe, the question becomes, does MDO's assumption about sufficient resources (including PGMs) to support its persistent and converging supposition, key to the "penetrate-dis-integrate-exploit"

Figure 4

Hypothetical Russian Advance for "All Russias"



framework, hold water when the enemy is defending from multiple urban locations along a 920-mile front, with secure lines of communication to its logistical and manpower base? The Battle of Mosul and the PGM crisis from 2015 to today, a vastly smaller problem against a far less numerically significant or resources-rich enemy, suggest that the answer to that question is no.

Given the limiting effect of hard constraints, it is entirely logical to assume that warfighting capabilities such as artillery, rockets, unmanned aerial vehicles, rotary-wing formations, air defense and other capabilities will diminish as the size of the land force increases. To be sure, the use of main efforts and supporting or shaping efforts already exist to account for this simple resource problem. However, in an LSCO environment with an MDO concept built around the idea of the persistence and convergence of enabling capabilities, the problem of main efforts and supporting efforts illustrates that without significant industrial mobilization, most units will be fighting as an economy of force, while only the lead elements will have access to those combat-enabling capabilities (see Figures 5 and 6). It is fair to assume that a problem like the one described above results in TRADOC's MDO concept not passing the feasibility test.

Figure 5

Diffusion of Combat-Enabling Capabilities in LSCO

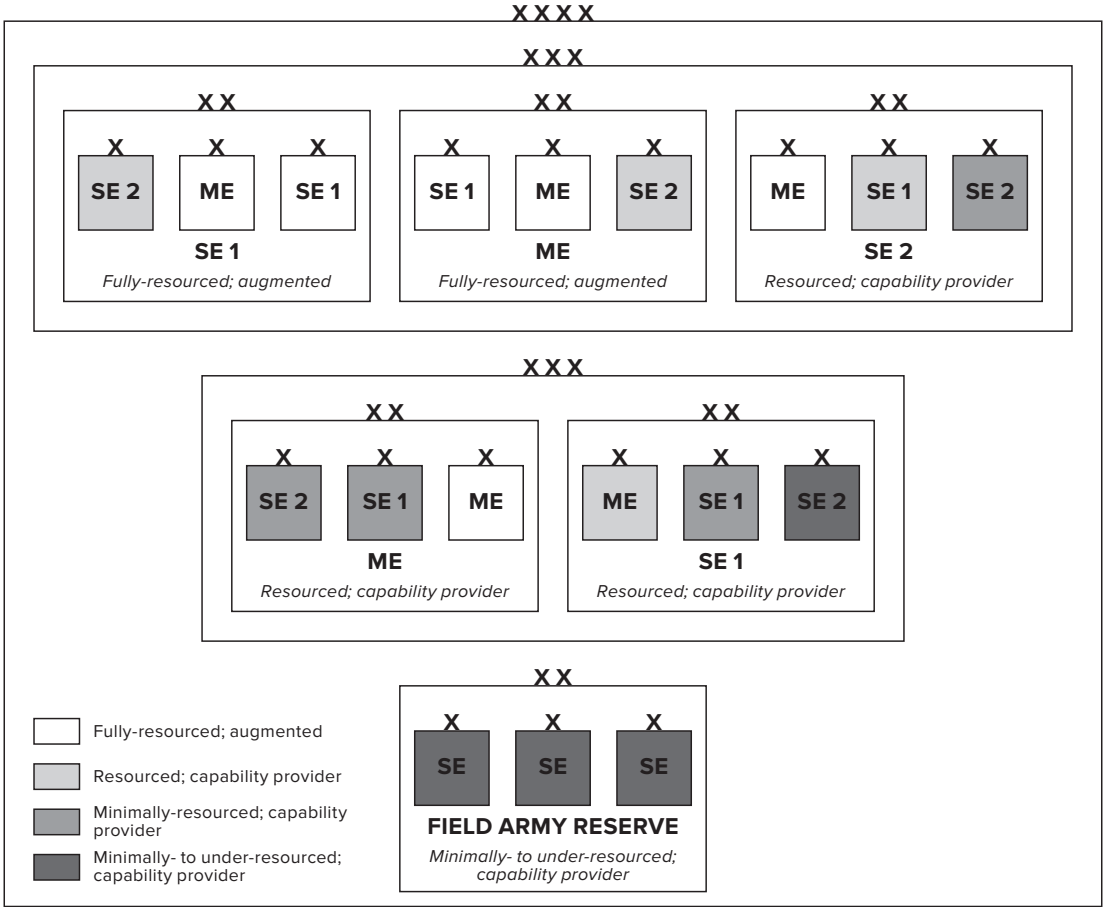
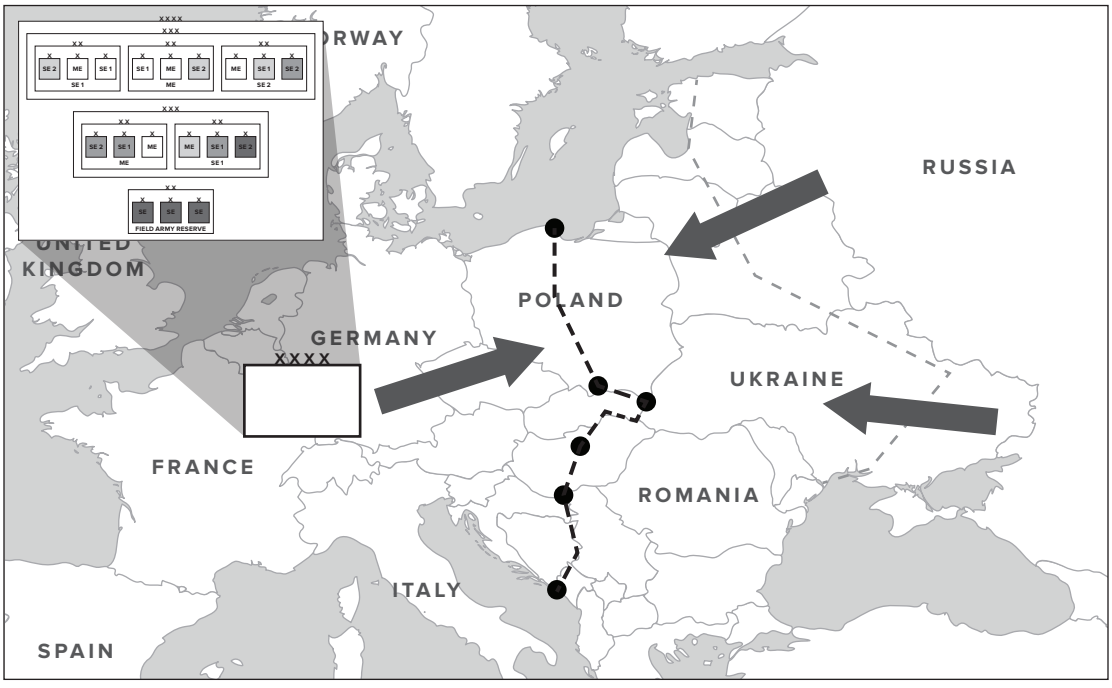


Figure 6

Notional Field Army Moving Into Contact With the Enemy



Analysis

MDO's position regarding convergence further compounds the persistence feasibility problem. TRADOC posits that convergence against a great-power competitor requires, "continuous and rapid integration of multi-domain capabilities to gain cross-domain overmatch at decisive spaces."[13] While MDO does make note of extended time frames, it fails to elaborate on extended physical fronts, i.e., the long distances along which a force will likely find itself operating in LSCO; this is where the problem with persistence and convergence lies.[14]

As the hypothetical scenario illustrates, the U.S. Army and joint force could very well find themselves operating along a highly-contested front, with an enemy defending in multiple urban areas spread across hundreds of miles and with secure lines of communication to its rear (i.e., out of contact with U.S. forces). If this becomes the case, the ability to rapidly integrate multi-domain capabilities to gain cross-domain overmatch in decisive spaces might not exist because the requirement (i.e., the number of locations, distance between locations and quantity of resources necessary to achieve overmatch) exceeds the capability of the Army and joint force. This question lies beyond the realm of theory and is beginning to surface in defense analysis.[15]

Further, the U.S. Army and joint force's inexperience with operating against this level of applied pressure and immense space will inherently create suboptimization as Soldiers of all ranks struggle to work through problems that are outside of the scale of anything that they have previously experienced.

These problems underscore the claim that persistence and convergence in a highly-contested environment against a great-power competitor might not be a meaningful solution to the problem. This situation prevents significant problems for the U.S. Army's MDO concept

as it is currently written. Therefore, MDO should be reworked to account for LSCO problems, to include: scale (i.e., geographic distances that cover vast stretches of land and sea); multiple decisive spaces stretched across a front; and that those decisive spaces are not enemy tank formations sitting in open terrain, but rather a heavily ensconced enemy in large urban areas.

Expanded Assumptions

Several assumptions, beyond those listed in TRADOC Pamphlet 525-3-1, can be drawn from the above examinations of dominance, applied dominance, convergence, persistence and frontage problems. Listed below, these assumptions should be incorporated into the existing MDO concept to help provide context and logic, and to assist strategists and planners in better utilizing MDO outside of doctrinal discussions.

1. Self-preservation is every actor's baseline goal.
2. Actors will not intentionally engage other actors in ways that put themselves in existential crises.
3. All international actors operate within an open-system; that system seeks order and will reallocate assets to maintain equilibrium during armed conflict.
4. Actors will kill off elements of their system when sustaining those elements becomes deleterious to the system.
5. Dominance is a matter of perception because incomplete information obscures available resources, intentions and timing.
6. If an actor perceives an adversary as dominant in relation to itself but chooses to engage that belligerent anyway, it will do so in a way that avoids self-destruction, offsets the adversary's strength and seeks tactical parity.
7. If an actor assesses that the cost of direct confrontation with another actor will rapidly exhaust its fixed resources, it will indirectly engage the adversary.
8. Dominance (D) equals one's resources (Re) plus time (Ti), divided by enemy action (En) plus self-sustainment (Su): $D = (Re + Ti) \div (En + Su)$.
9. Resource expenditure in an adversarial environment (Rx) is equal to quantity of one's force (Qf) plus one's frontage (Ft) plus the number of points of enemy contact along that front (Pc) plus the duration of enemy contact (Dr) divided by one's on-hand resources (Re) plus an actor's ability to replenish those resources (Rp): $Rx = (Qf + Ft + Pc + Dr) \div (Re + Rp)$. Note: This assumption (and equation) should not be law, but instead a model to assist in thinking and understanding resource expenditure. Further, friction or entropy can be factored into the equation to account for the natural tendency of things to not go according to plan.
10. Without economic and industrial mobilization in support of LSCO, battlefield persistence (Pr) is directly linked to resource expenditure (Rx) in an adversarial context; or, $Pr \leq Rx$. Therefore, the greater a subordinate unit's contact at one location, the less its higher headquarters can support subordinate unit contact at other locations along its front.
11. Without economic and industrial mobilization in support of LSCO, the ability of a headquarters to impose multiple dilemmas (Md) on an adversary decreases as the number of enemy contact points (Pc) and duration of that contact (Dr) increases across its front; or, $Md \leq (Ft \times Pc \times Dr \div Re + Rp)$.

Conclusion

The purpose of highlighting a few flaws within TRADOC's MDO concept is to help illuminate those shortcomings in hopes of achieving positive theoretical and doctrinal change. As military theorist J.F.C. Fuller writes:

> Method creates doctrine, and a common doctrine is the cement which holds an army together. Though mud is better than no cement, we want the best cement, and we shall never get it unless we can analyse war scientifically and discover its values.[16]

Illuminating these two flaws within the Army's MDO concept is done to help create the "best cement" as the Army and joint force continue to refine MDO. TRADOC should incorporate the theory of dominance and ZoPD. Doing so will provide MDO's practitioners with a useful framework for planning, analysis and operations, not only from a friendly side, but also when thinking about the enemy.

Several derivative assumptions come from analyzing the features and impacts of dominance. Those assumptions should also be added to TRADOC Pamphlet 525-3-1 because they can increase understanding by clarifying the ideas behind dominance, ZoPD and MDO's challenge-response dynamic among belligerents. In doing so, the assumptions support the practitioner's ability to plan, analyze and develop operations in an MDO environment.

Finally, as the Battle of Mosul (part of a larger, global, counter-terror campaign) illustrates, hard constraints must be accounted for when developing concepts, theories and doctrine. By the time Mosul concluded, the U.S. military was all but out of PGMs. If PGMs are a critical component of MDO, as it is currently written—and the concept is written based on best-case scenarios—then the ideas of persistence and convergence are not feasible. Therefore, the MDO concept needs to rework the role of PGMs, persistence, convergence and the "penetrate-disintegrate-exploit" model. Further, the MDO concept needs to note that both the best-case and worst-case scenarios are merely planning assumptions; otherwise, the entire theory is of little-to-no utility. In order to get MDO right, these two flaws must be addressed.

Notes

[1] J.C. Wylie, *Military Strategy: A General Theory of Power Control* (Annapolis, MD: Naval Institute Press, 2014), x.

[2] J.C. Wylie, *Military Strategy*, x.

[3] Training and Doctrine Command (TRADOC) Pamphlet 525-3-1, *The U.S. Army in Multi-Domain Operations* (Washington DC: Government Printing Office, 2017), vi.

[4] TRADOC Pamphlet 525-3-1, vi.

[5] Carlo d'Este, *Decisions in Normandy* (New York: Konecky and Konecky, 1994), 400–408.

[6] Carlo d'Este, *Decisions in Normandy*, 49.

[7] Marcus Weisgerber, "The US is Raiding its Global Bomb Stockpiles to Fight ISIS," *Defense One*, 26 May 2016.

[8] Paul Shinkman, "ISIS War Drains U.S. Bomb Supply," *U.S. News and World Report*, 17 February 2017.

[9] Jeff Daniels, "ISIS Fight Shows US Military Can Use Lower-Cost Weapons With Lethal Results," *CNBC*, 19 July 2019.

[10] Simon Montefiore, *The Romanovs, 1613–1918* (New York: Vintage Books, 2017), 365.

[11] Orlando Figes, *The Crimean War, A History* (New York: Metropolitan Books, 2010), 14–16.

[12] Bill Sanderson, "Leaked Transcripts Reveal Putin's Secret Ukraine Attack," *NY Post*, 21 September 2014.

[13] TRADOC Pamphlet 525-3-1, 20.

[14] TRADOC Pamphlet 525-3-1, C-2.

[15] Jen Judson, "Does the US Army Have Enough Weapons to Defend Europe? Exercise Defender 20 Will Reveal All," *Defense News*, 27 December 2019.

[16] J.F.C. Fuller, *The Foundations of the Science of War* (Leavenworth, KS: Command and General Staff College Press, 1993), 35.

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2425 Wilson Boulevard
Arlington, VA 22201

703.841.4300 ★ www.ausa.org