

# People Who Know, Know MDO

## *Understanding Army Multi-Domain Operations as a Way to Make It Better*

by Colonel Marco J. Lyons, U.S. Army,  
& Colonel David E. Johnson, PhD, U.S. Army, Retired



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Colonel David E. Johnson, PhD, USA, Ret., was a principal researcher at the nonprofit, nonpartisan RAND Corporation and an adjunct scholar at the Modern War Institute at West Point. After a long and dedicated career, first as an Army officer and then as a researcher, writer and lecturer for the defense community, he passed away in October 2022.

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Contents

In Brief .....v

In Memoriam: Dave Johnson .....vi

Introduction ..... 1

Why Army Multi-Domain Operations?..... 2

How Could This Be?..... 2

Don’t Tell Us What—Tell Us How ..... 2

What are Other Services Doing? ..... 3

Historical to Future Multi-Domain “Envelopment” ..... 4

Expanded Battle and Hyperwar ..... 4

The Meaning of Combined Domains..... 5

The Future of Integrated Operations..... 6

Conclusion: Future War and Joint Operations ..... 6

Notes ..... 8



## **In Brief**

- Future operational warfighting concepts should be grounded in actual intelligence about the future battlefield, the adversary and the adversary's primary weapon and other combat systems.
- Multi-Domain Operations (MDO) may be thought of in terms similar to combined arms theory and warfare.
- MDO is not unique to the post-Cold War era or recent U.S. military experience.
- Future battlefields against major power adversaries call for more survivable command, control, communications, computers, intelligence, surveillance and reconnaissance capabilities (C4ISR); robust logistics; and more integrated combined forces.
- It is urgent that Army and joint concept developers present MDO in as simple and as clear terms as possible because the U.S. joint force faces near-peer or peer adversaries in future combat operations.

### *In Memoriam: Dave Johnson*

David E. Johnson, principal researcher at the RAND Corporation and author of the influential *Fast Tanks and Heavy Bombers: Innovation in the U.S. Army, 1917–1945*, a seminal study of military innovation, passed away at the end of October, just as he was finishing this paper. His life's work focused on military strategy, doctrine, history and high command, and invariably reflected his incisive mind. Fully fitting tributes have already been written by Gian Gentile, John Gordon, Charlie Dunlap, John Spencer and John Amble. For me, Dave was a practical, no-nonsense mentor who shared his deep respect for history and logical thinking. He wanted to make the Army a better institution, wanted to make Army officers and leaders better examples of professionalism, and he encouraged this in me—and in many others.

I first met Dave through the 2017 Army Science Board (ASB) study of the early Multi-Domain Battle (MDB) concept. Our study team traveled across the country interviewing scientists, defense leaders and researchers—including Dave. Our interview with him was unique. I could not miss that he was focused on the practicality of the MDB concept: could it work, and how? He did not stop questioning the underlying assumptions and probing how it would be executed on a battlefield with joint partners. His ASB study contributions showed that he was not distracted by flashy-sounding technological solutions or tangential analysis. Later, as he counseled me in my professional assignments, he always pushed my thinking back to how Army formations could prevail in combat. Ultimately, he was committed to Army readiness, especially readiness for major war, even though this has not always been a popular issue in public defense discussions.

Dave cared about the health and future of the profession of arms, and saw everything through the lens of duty, exemplified in so many of the anecdotes he shared with me about his early Army career, but also about past generations of Soldiers. We talked a lot about the World War II generation of Army planners; they were thrown, in many cases unprepared, into a cataclysm—yet they quickly learned to focus on what really mattered: the basics. Not only that, but they made sure their lessons were passed on to the Soldiers who came behind them. That generation of planners had to bring together masses of force, over great distances, through what we now call contested environments, and win at the decisive point—and they had almost no practical examples to draw from. Dave and I talked at great length about the profound sense of duty that must have weighed on their shoulders. He believed that they learned fast and did what they did because they implicitly believed it had to be done. There was no other choice—only duty.

With Dave's passing, the Army has lost one of its great minds, one of its towering thinkers. He combined a powerful mix of qualities in a warrior: directly communicative, persuasive, compelling, erudite but caring. He was always available to me and was always direct in his counsel. He tirelessly encouraged me in my self-study and writing. He thrived on tackling the most difficult military problems, and he motivated me to do the same. His work had a great impact on me and on my development as a student of war, and I will be forever in his debt.

—Colonel Marco J. Lyons, U.S. Army

## **People Who Know, Know MDO: Understanding Army Multi-Domain Operations as a Way to Make It Better**

### **Introduction**

A new crop of service and joint warfighting concepts has sprouted up over the past few years; they are all attempting to find a military operational concept that will work against China. The Army's entry in the warfighting conceptual fray is Multi-Domain Operations (MDO). Understanding MDO is particularly important now because the Army is turning the concept (how it wants to fight) into doctrine (how it will fight).

Why is this important? Quite simply, the Army is the nation's principal service that is "organized, trained, and equipped primarily for prompt and sustained combat incident to operations on land."<sup>1</sup> At its most basic level, MDO will provide the architectural plans for how the Army will rebuild itself for future challenges in the domains of land, air, sea, space and cyberspace.<sup>2</sup> Indeed, the Army has gone so far as to establish its first new four-star headquarters in over 30 years—Army Futures Command—to serve as its architect.

There is, to put it mildly, no broad consensus on what MDO is. A 2019 NATO paper called for clear definitions to "dispel naysayers" who have a "pessimistic and dismissive view of MDO . . . as a mere buzzword, synonymous with joint operations."<sup>3</sup> This lack of clarity leads to claims that, to execute MDO, the Army will require substantial—even fundamental—change from organizations to authorities to overseas posture.<sup>4</sup> Essentially, realizing MDO will require more than an Army renovation; it will require a tear-down and rebuild. A more pessimistic charge is that the U.S. military, much less the Army, does not actually have enough process or technological capability to effectively integrate effects across all warfighting domains.<sup>5</sup>

Our goal in what follows is to explain the origins and broad details of Army MDO to serve as a basis for informed future discussions about its implications and relevance.



## Why Army Multi-Domain Operations?

The 2018 publication of *The U.S. Army in Multi-Domain Operations 2028* expanded what had previously been termed multi-domain battle into a broader concept that includes competition. This concept describes how the Army contributes to deterring adversaries in competition and defeating enemies in conflict.<sup>6</sup> This is not, of course, how MDO actually works. To be fair, the 2018 Army MDO concept does explain to some degree how Army formations execute these operations, e.g., penetration of enemy standoff capabilities and dis-integration of enemy antiaccess area denial systems. Nevertheless, despite the fact that the 2018 concept document includes a full-page “logic map,” the logic undergirding MDO is never explicitly explained. This is a critical flaw in the concept in the view of retired Army Brigadier General Huba Wass de Czege, one of the key writers of the Army’s 1980s AirLand Battle concept. Wass de Czege writes that, to be credible, “MDO must clearly define the military problem and articulate a theory of victory that is understandable and logical to Allies and adversaries alike.”<sup>7</sup>

## How Could This Be?

Where we are today is the result of a long trip. It has been five years since the release of an Army-Marine Corps white paper that committed those two services to the development of a multi-domain concept;<sup>8</sup> five years since the first version of the Multi-Domain Battle concept; and four years since the completion of the current MDO concept signed by the Army Chief of Staff. To go back even further, it has been 10 years since the 2012 Capstone Concept for Joint Operations introduced globally integrated operations, global agility and cross-domain synergy—in essence, a discussion of how to integrate operations across domains.<sup>9</sup> In the 2014 U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-3-1, *Army Operating Concept*, integration is discussed in multiple places and in different contexts.<sup>10</sup> Its importance was obvious then. Consequently, some argue that the situation is not as dire as it appears because current joint doctrine and service future operational concepts are, in effect, all-domain—the charge noted earlier. Others disagree; a 2017 Army Science Board study of the multi-domain battle concept found that existing joint and service doctrines, if executed with the current joint force against a peer adversary, would result in U.S. defeat.<sup>11</sup>

Quite simply, if existing approaches do not work in the future world of competition and conflict against peer adversaries, who may have decided regional advantages, we need a new concept. Consequently, what Army MDO is trying to do is realize the challenge posed by General Stephen Townsend, former commander of TRADOC, who had responsibility for concept development before the creation of Army Futures Command. He emphasized:

This change is not cosmetic—it is about growing an idea to its greatest potential in order to change the way we fight today and ensure overmatch against our adversaries of tomorrow. To do this we need clarity and alignment across the joint force, whole-of-government inclusion, and perspective that reinforces our need to compete effectively outside periods of armed conflict.<sup>12</sup>

This is a tall order.

## Don’t Tell Us What—Tell Us How

Discussions of MDO tend to focus on trumpeting what it *is*, with less attention to what it *does*. It is variously described as operations where units down to the lowest tactical level are operating in and across all warfighting domains<sup>13</sup> or as a newer, better version of AirLand Battle

combat.<sup>14</sup> Nevertheless, as Lieutenant Colonel Amos Fox, U.S. Army, wrote, the *how* of MDO has not been fully explained, e.g., how the proper functioning of such a central idea as “dominance” is essentially missing in the concept.<sup>15</sup>

Apparently, it is harder to explain *how* MDO works than *what* it is. There is a solution to this conceptual gap, as seen in a recent explanation that emphasizes that context is critical.<sup>16</sup> To be relevant, a military concept should be situated in the real-world challenges—the *why*—that it is designed to address. In the current environment, this means dealing with the newly emerging geopolitical realities posed by China and Russia. Clarity in the *how* of the concept also provides an explanation for the necessity of the U.S. Army to transform itself to become a multi-domain capable force.<sup>17</sup> It justifies closing materiel and other gaps between what can be done now and what is needed in the future. This is an important part of the larger dialogue.

### **What are Other Services Doing?**

There are other service conceptions of MDO beyond those of the Army. The U.S. Navy Distributed Maritime Operations returns that service to fleet operations against peer enemies. The Marine Corps Expeditionary Advanced Base Operations and related Marine Littoral Regiment are meant to reclaim a major amphibious operations capability in support of the Navy. Air Force ideas about joint all-domain command and control assert that they may become the central nervous system of next-generation joint operations and are directly relevant to Army MDO.<sup>18</sup> Perhaps most important for the entire joint force is that there have been unmistakable calls for advancing all-domain warfare. Two years ago, General John Hyten, then Vice Chairman of the Joint Chiefs of Staff, laid out the idea of future all-domain operations as being able to fight globally, against a globe-spanning adversary, at all levels of conflict intensity.<sup>19</sup>

In the past, joint warfighting concepts eventually emerged that were a consensus view among the services of how the joint force would fight. These joint concepts also largely incorporated then-existing service concepts. This approach has worked during joint operations to date. If it continues to do so in the future, pulling service concepts together should get the joint force to all-domain operations. But, this has not happened. The challenge before the services and the Joint Staff is to articulate what constitutes a joint theory of victory and what comprehensively explains how to actualize that theory. This is the really difficult work that is in front of us.

To better make sense of the necessity for a new MDO concept, anyone crafting that concept must address the strategic problem of identifying a starting point. This is generally best approached by designating a place, an adversary and the adversary’s capabilities that must be countered. This approach to explaining clearly why the concept is needed and how it will accomplish strategic objectives through military operations is a solid starting point for putting the project on a sound logical footing. In short, the concept development effort must be presented as grounded in a real-world military strategic concept.

The 2018 TRADOC concept did name China and Russia as adversaries—actually, as strategic competitors and as threats—and the adversary capabilities underlying the concept are based on the People’s Liberation Army and the Russian Armed Forces weapons and other combat systems. This is a good start. But the overall context for conflict is vague, which makes it difficult to understand what MDO is specifically expected to accomplish—beyond defeat of opposing military forces. The Army and joint concept for MDO should be approached like a meta-concept, not unlike the original AirLand Battle concept. That concept was an attempt to build off of a strong foundation of subsidiary theories, e.g., the superiority of deep attack and

the primacy of seizing the initiative. The focus on these primary tenants was driven specifically by the potential enemy's (the Warsaw Pact's) doctrine and superiority in numbers. MDO should be approached in a similar manner.

### **Historical to Future Multi-Domain “Envelopment”**

MDO is not new; it is peppered throughout the history of amphibious warfare. From the 490 BC Battle of Marathon during the Persian Wars to the first modern, large-scale amphibious assault at Gallipoli in 1915, amphibious operations have been difficult to execute.<sup>20</sup> But, if successfully executed, they maximize surprise and psychological and moral dislocation—qualities desired by accomplished battlefield commanders. The 1847 Battle of Vera Cruz during the Mexican-American War was the first large-scale amphibious operation conducted by U.S. forces.<sup>21</sup> There are important examples of mechanized warfare MDO throughout the 20th century, including World War II, e.g., the Solomon Island Campaign<sup>22</sup> and Operation Iceberg.<sup>23</sup> MDO is certainly not unique to the 21st century.

Throughout the history of war, the land and sea domains were seen as mediums through which to project military power.<sup>24</sup> The air warfighting domain developed quickly in the early 20th century. A similar pattern emerged with space in the 1990–1991 Gulf War, then again during the 2001 invasion of Afghanistan and the 2003 invasion of Iraq. It happened again in cyberspace with the 2010 Stuxnet attack on Iranian centrifuges.<sup>25</sup> These warfighting uses of space and cyberspace may turn out to be extremely tentative first steps to much larger scale operations in these domains in the future.

MDO is meant to maximize the effectiveness of contemporary arms, physical and non-physical, through the warfighting domains, across the continuum of competition-conflict, up to large-scale combat operations.<sup>26</sup> Deputy Defense Secretary Bob Work, speaking in 2015, laid out the aims in an early conception of what is now called Army MDO. It would be an operational concept that could organize, equip and employ forces with the ability to attack enemy forces repeatedly, continuously and progressively from multiple, distinct vectors by exploiting advanced capabilities, expanding effects through all warfighting domains simultaneously.<sup>27</sup> This was what is now termed “convergence” in its embryonic form. Work's description comported with the often-expressed view that MDO is an evolution of joint operations.<sup>28</sup> Work's conception of offensive action through multiple, converging attack vectors suggested futuristic pincer battles—“advanced Cannae”—or an entirely new form of envelopment warfare.

### **Expanded Battle and Hyperwar**

The precursor to MDO, multi-domain battle, was described in 2017 by General David Perkins, then TRADOC Commander, as an expansion of the battlefield.<sup>29</sup> Perkins was referring to the evolution from the extension in geographical space and time brought by the 1980s Air-Land Battle to the extreme ranges of space and the virtual dimensions of cyberspace. MDO is “hyperwar” in the sense of “hyper” meaning “over, beyond, above, excessive, and outside normal”; MDO is war with its character pushed to extreme boundaries, beyond what was previously considered possible. Hyperwar, as proposed here, is also an extension of the hypercompetition described by Nate Freier and others at the U.S. Army War College.<sup>30</sup>

MDO is rooted in the basic nature of war: in violence, chance and friction. At its simplest, it is deliberate combinations of entities from more than one domain, e.g., air-ground aviation attacks, airborne landings and shore-to-ship fires. It is complex in the sense of combining

multiple, diverse operations and actions to achieve some combination of dislocation, disruption and disintegration of the enemy. MDO works by exploiting opportunities for strike, fires and maneuver in different warfighting domains in complementary combinations.

The efficacy of MDO was demonstrated in an April 2019 corps-level warfighter exercise in which the U.S. 1st Infantry Division effectively reduced enemy defenses through the integration of fires, aviation attacks, tactical deception activities, vertical envelopment by light infantry and heavy armored penetration.<sup>31</sup> This fairly intricate pattern of apparently diverse operation types echoed the World War II era integration of artillery, aviation, tanks and infantry.<sup>32</sup> The outcomes of this warfighter exercise seemed to validate General Perkins's vision of two years earlier in that it leveraged the dislocating effects of indirect approaches. Importantly, MDO does not obviate the need for engagements and battles.

### The Meaning of Combined Domains

The 2018 *The U.S. Army in Multi-Domain Operations 2028* described the role of Army forces employing the concept in contributing to joint force operations confronting the Chinese and Russians (emphases original):

The *U.S. Army in Multi-Domain Operations 2028* concept proposes a series of solutions to solve the problem of *layered standoff*. The **central idea** in solving this problem is the *rapid and continuous integration of all domains of warfare* to deter and prevail as we compete short of armed conflict. If deterrence fails, Army formations, operating as part of the Joint Force, *penetrate* and *dis-integrate* enemy anti-access and area denial systems; *exploit* the resulting freedom of maneuver to defeat enemy systems, formations and objectives and to achieve our own strategic objectives; and consolidate gains to force a *return to competition* on terms more favorable to the U.S., our allies and partners.<sup>33</sup>

Layered standoff is the problem posed by Chinese and Russian antiaccess and area denial capabilities. The paragraph above outlines the core operational tasks that help explain how MDO works, providing a theory of multi-domain warfare—or, perhaps more accurately, to coin a term, combined domains warfare.

Like other theories, the theory of combined domains is built on past theories. So, for example, the 2017 *Multi-Domain Battle: Combined Arms for the 21st Century* concept paper argued that the contemporary battlefield required the ability to use combined arms principles to exploit temporary windows of advantage in and across domains.<sup>34</sup> With access to new warfighting domains in space and cyberspace, combined arms could be mixed with the theory of deep operations in early Soviet Red Army doctrine<sup>35</sup> and with the theory of the extended battlefield in the Army's earlier AirLand Battle doctrine—and could evolve to the expanded battlespace that General Perkins discussed. Finally, to complete the conceptual evolution, the speed, accuracy and information-based characteristics of current and projected capabilities point to the theory of combined domains—an admittedly novel theory, yet to be fully explored.

MDO works through complementarity and combined domains in a way similar to combined arms theory. In a way, if combined arms is a tactical theory and concept, then MDO is like combined arms at the operational level, substituting domain military effects for tactical battlefield effects. Combined arms, as a theory and concept of warfare, fully matured in the early- to mid-20th century with advancements in artillery, extension to the third dimension with

aviation, the shock provided by tanks and the maneuverability of motorized and mechanized infantry.<sup>36</sup>

### **The Future of Integrated Operations**

A theory of combined domains warfare is based on ideas of combined arms, expanded battlespace and positions of advantage. In the idea of combined arms is the theory of complementarity. In expanded battlespace is the theory of extensibility (or that effects may be extended over distances, physical or nonphysical). Inside positions of advantage is a suggested theory of relative military value (underlying maneuver warfare is the theory that an adversary will be increasingly forced to take action against his will based on a perception of the relative value of his position versus the enemy).<sup>37</sup> By exploring the theory underlying MDO, military practitioners can better explain *how* it works.<sup>38</sup>

Based on a theory of complementarity and domain interconnectedness, MDO works by creating combinations of interacting effects—physical, nonphysical, mental and moral—to weaken and collapse the enemy’s will to resist. These effects are accomplished by operations in and through multiple warfighting domains. Thus, MDO works by integrating effects in engagements and battles in different domains, physical and nonphysical. These effects demand integration at very different ranges and moments in time that account for rates of movement and changes in location and disposition. The purpose: to achieve the traditional effects of dislocation, disruption and defeat.

As MDO is essentially integrated operations—i.e., complexes, or groupings of different operation types, extensively linked in complicated ways—they lend themselves well to large-scale combat operations. Future large-scale combat operations can be broken down into major operational tasks, which then point to operation types. Based on the MDO work already done, this means subordinate concepts for achieving information and decision advantage; striking with precision and mass; deploying and sustaining military power for optimal tempo; gaining advantage in land, sea, air, cyberspace and space battles; and consolidating gains. This then leads to force design demands: more survivable command, control, communications, computers, intelligence, surveillance and reconnaissance capabilities (C4ISR) than the enemy; robust logistical systems; and more integrated and interoperable combined forces.

### **Conclusion: Future War and Joint Operations**

Experimentation to analyze and assess whether future MDO will work is critical. These efforts should begin with a reasoned set of required capabilities for a projected future joint force. Given U.S. geostrategic realities, likely future national security strategy and threats posed by potential adversaries, this future joint force will have to be a globally integrated “response” force. Needed future joint force capabilities may be derived from analysis of future joint response operational demands given large-scale threats, a hostile environment (for access), and requirements for forced entry. Using a joint force capabilities study from the past, templated capabilities should include: C4ISR and missile defenses; long-range precision strike leading to theater precision and large-area attack; forward deployed building to early entry forces; direct assault/insertion building to full spectrum forces; and theater support.<sup>39</sup> From these future required capabilities, broad actions that describe how these capabilities contribute to a theory of victory can be identified, e.g., protect and maintain forces through effective C4ISR (prevent surprise) and missile defense; suppress and disrupt at range; maneuver in ways that maximize surprise; concentrate effects; and mass for battles.

To be clear, MDO has not yet been used extensively in great power wars, though early incarnations of it were used in some of the later stages of World War II. It is impossible to say with certainty how MDO will unfold in a great power war. There is, however, an underlying theory—suggested above by the term *combined domains* warfare—that can be used for training, education and force design purposes. This line of thinking rests on the notion that MDO will turn out to be “right enough,” to echo Michael Howard’s well-known remarks about military innovation and change.<sup>40</sup>

It should be noted that the 2018 Army MDO concept broke important new intellectual ground; this gain needs to be exploited with more analysis. The concept made important forward strides in advanced future warfighting theory by linking competition and conflict. The concept also incorporated important notions such as globally integrated operations and tried to link cross-domain synergy and overmatch with the idea of convergence. Nevertheless, more work remains to be done to answer the question about *how* MDO work is critical; the answer will contain the seeds of a theory for how the Army and joint force fight in the future. It is the crucial work needed to turn concept into doctrine and theory into practice.

Thus, the urgent imperative is for the Army and joint concept developers to present a clear articulation of how MDO can function effectively enough to support national security objectives—how it links ends against real-world enemies, operational and tactical ways, and warfighting capabilities.

The Chinese and the Russian battlefield threats await.



## Notes

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