A car bomb explodes next to Iraqi special forces armored vehicles 16 November 2016 as they advance against Daesh forces in Mosul, Iraq. Although nearly four hundred thousand civilians had reportedly fled the city, several hundred thousand still remained, caught in the crossfire while Daesh tenaciously defended its last major foothold in Iraq. The battle-seasoned special forces along with other coalition-supported conventional forces made slow progress inside Mosul as they conducted fierce house-to-house fighting against defensive positions that Daesh had months to prepare. (Photo by Felipe Dana, Associated Press)

Theater Land Operations

Relevant Observations and Lessons from the Combined Joint Land Force Experience in Iraq

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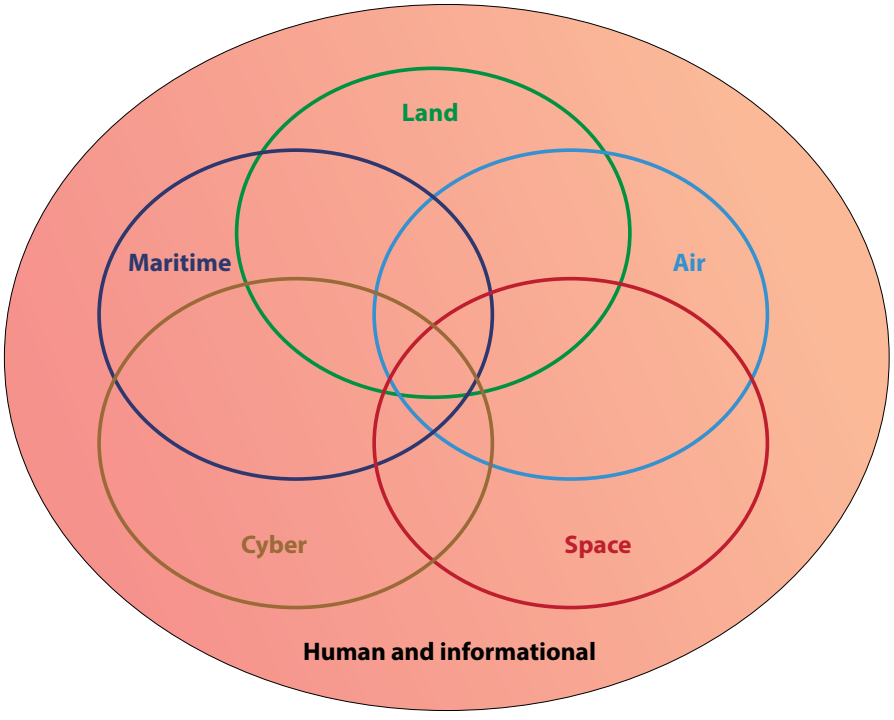
In 2016, the campaign to destroy the Islamic State as a fighting force while also pushing any remaining fighters out of Iraq was in full swing. The combined joint force land component command (CJFLCC) in charge of the joint fight during Operation Inherent Resolve was based on the headquarters of the 101st Airborne Division, but the mission differed notably from previous division-level efforts during

the coalition-led counterinsurgency fight in Iraq. As a combined joint land component, it was the lead agency for a nineteen-nation coalition that supported combat operations across the entire country, and it was the principal interlocutor and liaison with the Iraqi Security Forces (ISF) leadership. The ISF consisted of a combination of Iraqi army, air force, special operations forces, and police who together provided the essential and decisive but finite ground-maneuver component. Throughout 2016, they conducted large-scale offensive maneuver-and-hold operations to clear Daesh (a derogatory Arabic language acronym for the Islamic State) from the Euphrates and Tigris River valleys with an emphasis on the principal urban areas including Fallujah and Mosul.

The CJFLCC mission was focused on the military defeat of Daesh and required a diverse and active advise-and-assist network. Mission accomplishment necessitated the establishment of combined, joint, and supporting fires; intelligence, surveillance, and reconnaissance (ISR) capabilities; and logistical networks to enable ISF operations. This was supported by a force generation effort to prepare, train, and equip key units of the ISF for combat against Daesh. The CJFLCC was a principal integrating node at the upper tactical and operational levels inside Iraq, and it held and exercised significant authorities and influence over the coalition support to the ISF-led campaign. The CJFLCC operated across all domains and, to some extent, functioned as a key integrator across all domains. For example, even in this largely landlocked tactical fight, maritime ISR, fires, and strike effects launched from the sea made a significant and sustained contribution to the CJFLCC mission.

In this situation, the CJFLCC came head-to-head with the nature of the modern battlefield as it operated against a capable, though not near-peer, enemy whose grasp of action across domains, including cyber and human, was notably high. The year 2016 saw the marked degradation of Daesh inside Iraq as the ISF successfully retook 60 percent of the ground previously lost. This fight has significant lessons for future warfare, including some that may inform the nascent multi-domain battle (MDB) concept (see figure).



(Graphic by authors)

Figure. Proposed Multi-Domain Model

Lessons Learned

Success in 2016 was in part due to MDB-style cross-domain application of capabilities integrated with "old school" ISF-led close combat. To properly share significant lessons learned from this fight, we provide the following key observations.

Observation 1: Global capability sourcing is now the norm. Geography is less of a constraint on sourcing capabilities than at any time in previous history. While physics still applies to constraints, particularly in air, land, and sea, the options to source a diverse range of capabilities globally is now a reality. The range and reach of the physical domain capabilities are at a historical high, and the cyber and human domains are not limited by time or space. Coalition force contributions are also

now more diverse and add value as multiple options exist across the domains. For example, some nations have different legal frameworks that enable action in cyberspace or in the information environment more quickly or with fewer constraints. This had a direct tactical and operational impact inside Iraq during 2016. Instant and ubiquitous modern communications and information technology have compressed the boundaries between the strategic, operational, and tactical levels. And, in some domains such as cyber and human, the boundaries can be meaningless or at least blurred.

Observation 2: The human domain is of preeminent importance, and it is the key to both victory and defeat. Operations in Iraq in 2016 once again confirmed the basic observation that wars are fought by people for human ends and purposes. This has long been a central tenet in both Eastern and Western theories of war; ultimately people (on both sides) decide whether they have won or lost, not platforms or systems.[1]

The nature of the human relationships between the coalition force and the ISF (plus a diverse range of other stakeholders) was pivotal to mission success. While this is always important, the 2016 situation served to drive home the criticality of human relationships. This time, the ISF was unequivocally in the lead, and only the Iraqis had the means and authority to close with and destroy the enemy on the ground in close combat, arguably the priority requirement for campaign success. This time, coalition forces could not do it themselves; they had neither the force nor the authority to do so. Therefore, the coalition advise-and-assist purpose was, at its heart, designed to assist the Iraqis to grow and field the levels of organizational confidence, trust, and respect necessary to win against this enemy on this ground. This was a human/cognitive objective. The innumerable daily connections and interactions that took place around the planning and execution of the campaign against an unconstrained, ruthless enemy were absolutely central to Iraqi success and confidence. We watched and engaged at multiple levels (battalion to Army) and in many places. Over nine months, we witnessed the Iraqis begin to understand and then firmly believe that they could and would win.

The human network and the method of maneuvering and influencing across and through it to build a collective organizational outcome is dynamic and endless, and it is arguably more complex and difficult than any military technical synchronization challenge. Information and capabilities from all domains operated together to achieve this human, cognitive, and emotional outcome. Perhaps the ultimate marker of success was the Mosul counterattack plan and orders, written and issued in October 2016 by Iraqis to Iraqis with coalition commanders sitting respectfully to the side and listening. At this moment, we clearly knew they would take Mosul—no easy challenge—and defeat this enemy. If, as Carl von Clausewitz suggested, war is an act of violence to compel our opponent to do our will, then the Iraqis had reached a tipping point in their ability to compel that had been building and growing since the recapture of Ramadi almost a year before.[2] The coalition contribution exercised a major influence on the rate, nature, and strength of this Iraqi human and organizational evolution.

Observation 3: Multi-domain capabilities are now applied at every level from strategic to tactical. Gone are the days where a localized battalion or company attack relied almost exclusively on capabilities that were provided by the parent brigade or division (e.g., infantry, armor, artillery, engineers). It was common practice in 2016 for action at the lowest tactical level to be directly supported by nationally and coalition sourced multi-domain capabilities (e.g., ISR, information operations [IO], cyber, electronic warfare [EW], military deception, and others). Often this occurred without the direct knowledge or input of the tactical maneuver force itself. In one attack against Daesh forces near the town of Sharquatt in late 2016, a multinational

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full-spectrum application of strike, IO, EW, cyber, public affairs (PA), and military deception around a small "economy-of-force" Iraqi ground maneuver force caused the enemy to break and run without fighting. Kinetic fires were comprehensively integrated, and the result approached very close to the MDB ideal. The fires solution was effectively "service agnostic," and was often selected from a range of options sourced from across a coalition joint force.

A large scale, comprehensive, and successful example of MDB was evident in the advance to secure Qayyarah Airfield West, which involved a multidivision advance by the ISF and a contested river crossing of the Tigris using, at the time, all available Iraqi major tactical bridging assets. This advance and attack was enabled and supported by the application of capabilities in all domains drawn from organizations and sources from the strategic to tactical levels. Comprehensive IO, EW, PA, counter-improvised explosive device, and military deception assets integrated with a multitarget strike sequence, drawing on the full set of lethal and nonlethal capabilities to destroy, degrade, and influence enemy target sets in depth. This package of capabilities was integrated and synchronized around the ISF maneuver plan and aimed directly at the full range of threat vulnerabilities.

Observation 4: Expanded capability options are now drawn from beyond traditional military and national boundaries. The traditional military maneuver means and fires are as critical as ever, but they can now be augmented and amplified in ways that are quite literally only limited by the imagination. Many of these capabilities are delivered by nonmilitary agencies and by other countries or actors. The net effect is that options to exploit enemy vulnerabilities—directly or indirectly, lethally or nonlethally—have expanded. Their combined and synchronized application offers a way to exponentially amplify the overall effect on an adversary.

The MDB focus on joint integration is entirely correct but needs to be further expanded beyond military and national boundaries. This requires finding new ways to access and apply the full range of available capabilities. The premier example of this in Iraq 2016 was the evolution of a "new," holistic way of looking at targeting that evolved to encompass and apply all possible means to defeat the enemy. The "old" ideas of kinetic and nonkinetic, and lethal and nonlethal, proved inadequate to capture the full range of options available. Traditional kinetic targeting was merged with the application of "all available means" capable of informing and influencing the enemy and the operating environment. This had to be founded on a comprehensive understanding of the enemy, the operational environment, and the friendly force set. Systemically, it also led to the breaking down of traditional specialty "silos" to build an "all means" approach to targeting enemy vulnerabilities through all domains. This is likely to remain one of the pivotal skills on any future multidimensional battlefield.

Observation 5: Federated planning, trusted information sharing, and decentralized action—is the new norm. Most practitioners in complex, contemporary land operations can relate to the expression "herding cats." One look at the coalition and "other" liaison officer set in Erbil, the capital of Iraqi Kurdistan, at any time during 2016 would cement this image. There is a now a need to do even more and find a way to get those same "cats" to run as a pack of wolves.

Given the Daesh enemy, our range of modern capabilities, and the nature of the Iraq mission, a *federated* planning and *decentralized* execution model within a common mission framework proved essential.[3] There was no centralized, detailed control option on the table; the world was just not like that. We learned one may not own or ever even see those who apply a particular capability in support of an operation. They may not be military or even in your national force structure. They may not have identical mission end states but rather carry an overlap in interests or a discrete set of limited common objectives. *You may have limited or no authorities over their employment*. In this environment, it is the commander's priorities combined with the mission objectives, extant authorities, and a federated planning approach applied around a common battlefield framework that enables effective decentralized action by multiple actors. This in turn allows for the widest range of capabilities to be applied in real time without detailed centralized direction or control. (This is not to undersell the ongoing essential requirement for command-directed, relentless synchronization and orchestration by the staff, especially in the traditional military capability lanes.)

Ultimately, all stakeholders will act either as directed or because it is in their mutual interest to do so, and they must all be enabled through federated planning, a common intellectual framework, and constant

Soldiers with Battery C, 1st Battalion, 320th Field Artillery Regiment, Task Force Strike, execute a fire mission with an M777 howitzer 7 August 2016 during an operation to support Iraqi security forces at Kara Soar Base, Iraq. Battery C soldiers supported the Combined Joint Task Force–Operation Inherent Resolve mission by providing indirect fire support for Iraqi security forces as they continued to combat Daesh and retake lost terrain. (Photo by 1st Lt. Daniel I. Johnson, U.S. Army)

communication and information sharing. Only then are they free and able to run as members of a pack.

Observation 6: Nontraditional command-and-control solutions are the new way to do business, and self-synchronization is increasingly important. Falling directly from Observation 4 is a need to rethink command and control (a military idea) for the multi-domain battlespace. The standard Army solution is to "own" a capability through traditional command and control (C2) arrangements such as operational or tactical control, or to have direct authorities over its employment. Plans are nested and initiated by formal orders based on a hierarchy of authority. Throughout 2016, this traditional approach remained critical, especially in relation to the execution of the decisive ground maneuver fight. The highest risks were incurred in the close combat maneuver fight, and the CJFLCC focus was supporting the ISF's effective application of their finite ground combat force inside an enabling "bubble" of multi-domain shaping support. A principal function of the CJFLCC remained the careful synchronization of effects in support of the main effort ISF close combat force.

The Iraq 2016 experience also revealed that traditional C2 is not the only way to do business in the modern multi-domain battlespace. *Unity of effort* remained the essential requirement and needed to be achieved even when traditional unity of command was incomplete, imperfect, or not possible. *Command relationships* (the human dimension) proved critical and were founded on close personal interaction and open communication between the critical actors regardless of the stated formal C2 status or line diagram. One look at most C2 diagrams of the last fifteen years tells you it is not a simple matter of "working for the boss." For example, no tactical commander will ever own another nation's offensive cyber capability or special IO capabilities, but you can set conditions for their integrated

employment via inclusive *federated* planning and clear communication. This allows those stakeholders with similar objectives to independently operate in a way that amplifies and reinforces your organic capabilities. In short, it allows for *self-synchronization* to achieve a unity of effort around common objectives and established priorities.[4] At its most limited level, it can actively defend against inadvertent friendly fratricide.

Authorities always remain critically important because they set the control and influence held by a commander by function or in time and space, and they provide great leverage to encourage and regulate the actions of other organizations over which the commander may have little or no direct control. The importance of C2 and authority design and the level of delegation cannot be overstated. For example, the vesting of deliberate strike authority inside Iraq with the CJFLCC commander served as a forcing function for cooperation and drew many actors into a conversation about objectives and mutual interest. The absence of an authority at your level does not mean that capabilities cannot be sourced but rather reemphasizes the importance of federated planning and trusted information sharing. Where authorities are held higher, work needs to be done to ensure the necessary capabilities can be accessed and synchronized in a timely manner. For example, one smart colonel observed, "It is far easier to drop a bomb in this theater than it is to send a tweet."[5] He was right, and we need to work on either the delegation of authorities or establishing mechanisms where capabilities can be appropriately and effectively accessed through the directed authorities structure.

Observation 7: A disciplined, systematic framework that binds the strategic to the tactical is as important as ever. Given the complexity of multiple actors and capabilities operating from the strategic to the tactical levels, the importance of a clear, disciplined framework around which capabilities can be effectively and efficiently applied, organized, coordinated, and self-synchronized is paramount. This is not a new idea, but the experience of Iraq 2016 has served to reinforce this as a fundamental requirement in future multi-domain battle. There is a need to define fights at echelon and for shaping operations in a way tailored to each mission.

The development of a battlefield framework in Iraq in early 2016 based on the doctrinal close, deep, and rear construct was central to creating a common targeting picture that enabled federated target development and the application of multiple means—lethal and nonlethal—in a coherent way. It also allowed a nesting of inform-and-influence efforts by multiple actors from across the coalition and those who were operating from both inside and outside of Iraq. Even without direct interaction between actors, the framework allowed self-synchronization and deconfliction. This also provided a mechanism through which the employment of scarce assets such as ISR and strike could be regulated and applied. Also pivotal to dealing with the complexity and range of cross-domain action by multiple actors was the development and employment of a purpose-designed assessment methodology that was tailored to mission and grounded in a systematic analysis of measures of both effectiveness and performance tied tightly to mission objectives.[6] This is another example of difficult but essential work that remains, probably forever, a mix of art and science.

Based on the Iraq experience, there is an unequivocally clear need for the multi-domain battlespace to operate around a battlefield architecture and systematic framework that allows and supports the effective and efficient application of all capabilities.

Observation 8: Policy, procedures, and systems have a critical impact on mission accomplishment. What can practically be done is heavily influenced by an organization's policy, procedures, and systems. By their nature, these things are historical. In the case of command, control, communications, computers, and intelligence systems, they are complex, extensive, and expensive. One primary lesson from Iraq 2016 is that there is a need for a "first principles" review of policy, including doctrine, procedures, and systems in the light of the multi-domain reality.[7] One obvious weakness remains information sharing across organizational and national boundaries. Despite fifteen years of war, the bureaucracy remains a twentieth century design that is slow, rules based, and formulaic. This is an international problem that requires a concerted relook by multiple actors, agencies, and nations. It will certainly take hard work and may mean carrying the fight against traditional gatekeepers, but it needs to be done before the next big fight.

Shared understanding and situational awareness provide a further absolutely pivotal example of requirements that are central to allowing effective and efficient

An Australian soldier assigned to Task Group Taji conducts bayonet training 3 January 2016 with soldiers assigned to the 71st Iraqi Army Brigade at Camp Taji, Iraq. The combined task group consisted of around three hundred Australian Defence Force personnel drawn largely from the Australian Army's 7th Brigade, alongside approximately 105 New Zealand Defence Force personnel. This training was critical to enabling the Iraqi security forces to counter Daesh as they worked to regain territory from the terrorist group. (Photo by Spc. William Lockwood, U.S. Army)

multi-domain capability application. During 2016 in Iraq, the on-the-run development of a CJFLCC off-the-shelf, coalition-accessible, software-generated common operational picture was central to galvanizing coherent action and ensuring effective force protection. Once built, this tool spread like a positive systemic virus and grew as more and more agencies (higher, lower, and lateral) tracked it or contributed directly to it. It allowed multiple actors to "see" the fight from wherever they were located globally and to focus their efforts around friendly force "truth." It was one simple tool that had a far-reaching positive impact because of the shared understanding it generated.

Observation 9: The quality of people remains the most important element. Not everyone can handle complexity, especially under pressure and in a high threat, time-constrained environment. This is not a new observation, but it remains a fundamentally important one. Iraq-style MDB in 2016 needed complex-problem solvers who were able to overcome institutional and intellectual boundaries. For example, one National Guard captain almost single handedly corralled the plethora of IO stakeholders and linked them to both the coalition plan and the Iraqi psychological operations network. There was no textbook or doctrine for that. Simultaneously, more senior and experienced personnel struggled with "how to get anything done in this place." The clear need is for resilient, critical thinkers who are good with humans and who are self-aware, determined, and output focused. People need to be adaptable (able to do new things), versatile (able to do many things), and agile (able to change what they are doing quickly). The specialists need to be more general and the generalists more interested in specialties. We need an end to silos, or at least we need permeable walls. The key is selection, training, and especially education and then experience. As stated above, not everyone is able to handle the challenges of the MDB operating environment, and the capacity to do so cannot be assumed. Such capacity is not especially resident

An RQ-4 Global Hawk awaits standard maintenance while a heavy fog rolls across the 380th Air Expeditionary Wing flightline at an undisclosed location in southwest Asia 12 January 2017. Global Hawks have provided coalition partners such as the Iraqi security forces with accurate intelligence necessary for precisely striking important Daesh facilities and supply routes in support of Combined Joint Task Force-Operation Inherent Resolve. (Photo courtesy of Wikimedia Commons)

in any particular unit, branch, or culture. Everyone needs testing and developing in a battle-lab–style exercise and intellectual environment that will prepare them for the challenges of MDB in practice.

Conclusion

While there are no doubt many other observations that could provide significant material for both training and education, the above nine were significant in their applicability to not only Iraq in 2016 at the theater level, but also to future warfare as seen in the evolving MDB concept. As we continue to experiment and test future concepts for use in the warfare of today and tomorrow, we must not hesitate to leverage recent and current conflicts for appropriate lessons. While by no means is the fight against Daesh near-peer, the group's ingenuity and evolution on the battlefield no doubt mimics what more capable nation-states will employ in any future conflicts. Let us learn today's lessons and apply them for future effect. ■

Notes

1. Michael I. Handel, *Sun Tzu and Clausewitz: The Art of War and On War Compared* (Carlisle Barracks, PA: U.S. Army War College, 1991).

2. Carl Von Clausewitz, *On War*, trans. Michael Howard and Peter Paret (New York: Oxford University Press, 2007), 31.

3. *American Heritage Dictionary* online, s.v. "federate," accessed 31 May 2017, https://www.ahdictionary.com/word/search.html?q=federate. *Federate* is defined as "to cause to join into a league, federal union, or similar association." *Federated planning* is defined here as planning and analysis for the achievement of a common purpose by a diverse range of multiple actors and entities drawn from both within and without the lead planning organization. Federated planning in Iraq would regularly be led by the combined joint land component but would involve and

draw inputs from a diverse range of coalition, Iraqi, national, interagency, international, and nongovernmental actors, entities, and organizations.

4. Vice Admiral Arthur K. Cebrowski and John J. Garstka, "Network-Centric Warfare: Its Origins and Future," *Proceedings* 124, no. 1 (January 1998): 28–35. The authors defined *self-synchronization* as "the ability of a well-informed force to organize and synchronize warfare activities from the bottom up. The organizing principles are unity of effort, clearly articulated commander's intent, and carefully crafted rules of engagement. Self-synchronization is enabled by a high level of [knowledge of] one's own forces, enemy forces, and all appropriate elements of the operating environment. It overcomes the loss of combat power inherent in top-down command directed synchronization characteristics of more conventional doctrine and converts combat from a step function to a high-speed continuum." Self-synchronization is defined here as doing the right thing at the right time for the right reason without having to be directed by someone higher in a chain of command.

5. J5 combined joint force land component command, comment to author Maj. Gen. Roger Noble, June 2016, Baghdad.

6. A campaign assessment methodology is the process and system designed and implemented to assemble data and input that allows for the ongoing systematic analysis of the effectiveness and efficiency of campaign execution in pursuit of the specified mission objectives. A robust assessment methodology allows for a systematic ongoing review of progress and the identification of critical issues, and it facilitates and assists in the timely and targeted command-directed modification of the plan in response to the real-world outcomes of campaign execution.

7. A "first principles review" is an analysis of a policy without immediate deference to standing convention, policy, and thinking. It is a review from scratch and through an analysis of its core elements. The focus of this type of review is on the primary purpose in order to construct a solution that works in the contemporary context: what are we trying to do, why, and how do we best do it; not, what do we do now and how could we adjust? This does not mean disregarding mandated legal or policy requirements, but it can include scrutiny of those requirements and actions to modify the law or policy if this is considered essential or necessary.

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