President Barack Obama talks with Iraq's Prime Minister Nouri al-Maliki during secure video teleconference in Situation Room, The White House, October 21, 2011 (White House/Pete Souza)

Flawed Jointness in the War Against the So-Called Islamic State

How a Different Planning Approach Might Have Worked Better

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Not long after the first round of anemic air strikes against the so-called Islamic State (IS) on August 8, 2014, it became clear to most that the initial effort ordered by President Barack Obama and undertaken by U.S. Central Command (USCENTCOM) lacked an overarching strategy based on a well-founded understanding of the enemy and on a weighing of the full spectrum of available response options. Instead, USCENTCOM's

leaders fell back on their familiar past experiences and assessed IS as simply a resurrection of the recently defeated Iraqi insurgency rather than as the very different and ambitiously aggressive state-in-the-making that it actually was. As a result, they opted to engage the jihadist movement with an inappropriate counterinsurgency (COIN) approach that misprioritized rebuilding the Iraqi army as its predominant concern rather than pursuing a more promising strategy aimed at not only addressing Iraq's most immediate security needs but also attacking the enemy's most vulnerable center of gravity in Syria from the first day onward.

To be sure, throughout the 4-year-long effort belatedly codenamed Operation *Inherent Resolve* (OIR), the performance of the coalition aircrews who fought the war at the execution level was invariably able and impressive, reflecting the high standards of competence first showcased in Operation *Desert Storm* in 1991 and later sustained in all subsequent U.S.-led air operations worldwide. Yet by having wrongly adjudged IS as just a reborn insurgency and having misguidedly engaged it as such, USCENTCOM took as long to neutralize a fairly tractable low-technology enemy in the bounded spaces of Iraq and Syria in the second decade of the 21st century as it took the United States, in a total war for ultimate stakes, to defeat the far more powerful Imperial Japan and Nazi Germany in two theaters on opposite sides of the globe during World War II.

This review of the OIR experience considers how an alternative approach that made better use of USCENTCOM's fighting components in a more productive flow plan might have yielded the desired outcome more quickly and at a substantially lower cost in overall sorties flown, expensive munitions used against often meaningless targets, and innocent Iraqi and Syrian noncombatant lives lost along the way. Such a more purposeful response would have begun by USCENTCOM's having first sized up the adversary for what it actually was—a self-avowed embryonic state—and conducted the necessary prior target system analyses in both Iraq and Syria that would be essential for underwriting the campaign's strikes against the enemy's greatest vulnerabilities, assigned a subordinate Combined Joint Task Force (CJTF) commander for OIR whose component was best suited for conducting the campaign's initial operations, and then amended that command structure's leadership as deemed most appropriate once the U.S. role in the campaign shifted from an air-only counteroffensive toward overseeing a more truly joint and combined air-land campaign. Such a more fruitful approach would have leveraged USCENTCOM's air component as the *supported* force element at the campaign's start. Later, the coalition air component would have been swung to a more fully *supporting* role under a CJTF ground commander once U.S. and allied special operations forces (SOF) teams and joint terminal attack controllers (JTACs) began working with indigenous Iraqi and Syrian ground troops in a final land-centric push to defeat the enemy once and for all.

Some Consequential Missteps at the Campaign's Start

Any effort to learn usefully from the early failings of OIR must first recognize that the main reasons for the campaign's initial slowness to show much progress did not emanate from within USCENTCOM, but rather were occasioned entirely by a top-down decree from the Obama White House. As was later recalled by USCENTCOM's deputy commander at the time, Vice Admiral Mark Fox, it was "the Obama administration's . . . palpable reluctance to get more deeply involved that was the underlying cause of the campaign's slow and halting activities during the early days of the crisis." Admiral Fox further underscored that "it was Obama's decision to completely withdraw all U.S. forces from Iraq in 2012 that created the vacuum that [IS] filled in 2014," and it was the Obama national security team's "insistence on extremely restrictive rules of engagement [ROEs] to ensure the avoidance of noncombatant fatalities and reluctance to expand the fight into Syria until having been absolutely dragged there by events that accounted for [USCENTCOM's] initial muddled response to the [IS] threat."[1]

That said, even with all due allowance for the constraints imposed by Obama and his White House subordinates that so badly hampered USCENTCOM's freedom of action at the campaign's start, that organization's long-ingrained land-warfare predispositions also figured prominently when it came to generating the command's ultimately chosen response to the rise of IS. As one Air Force colonel aptly recalled in this regard, "it would be an understatement to say that there was a very Army-centric dose of operational art [prevalent at USCENTCOM's headquarters] in the summer of 2014." That fact, he stated, worked mightily "to constrain any semblance of an interdiction campaign" emerging as a part of that command's initial combat response.[2] In a compelling testament to that predisposition when it came to their initial tasking to take on IS, USCENTCOM's leaders almost by natural force of habit misread the jihadist movement as simply a regenerated insurgency of the sort that they had previously fought throughout the preceding decade. That flawed assessment naturally drove them to pursue an inappropriate COIN strategy and to accede to equally inappropriate and inhibiting ROEs quite independent of the constraints insisted on by Obama's White House. That approach stressed the minimization of civilian casualties as the campaign's main imperative rather than going with all determination for the Islamist movement's throat.

Those initial planning missteps, however, were themselves natural outgrowths of an arguably even more suboptimal decision by USCENTCOM's commander, General Lloyd Austin III, USA; namely, his having assigned a three-star infantry general to oversee the first round of fighting against IS, even though he surely knew that any such effort would entail air-only operations for a year or more, at least on the part of any involved U.S. forces. To be sure, as Admiral Fox

U.S. Soldiers assigned to Battery C, 2nd Battalion, 319th Airborne Field Artillery Regiment, 82nd Airborne Division, fire M777 155mm howitzer during fire mission near Mosul, Iraq, February 3, 2017, in support of Combined Joint Task Force—Operation *Inherent Resolve* (U.S. Army/Craig Jensen)

later pointed out, USCENTCOM's air component commander at the time had a full enough plate already, providing needed air support to the ongoing war in Afghanistan, whereas the Army general ultimately tapped to command OIR "had a joint task force headquarters already set up in Kuwait and had no combat responsibilities in Afghanistan."[3] Yet if there ever was a nascent challenge in USCENTCOM's area of responsibility that begged for an air-centric solution, at least while IS was still gaining strength and when the now-moribund Iraqi security forces (ISF) were nowhere near ready to take on the jihadist movement, it was at the start of OIR in mid-August 2014 and throughout the campaign's first year thereafter.

Nevertheless, General Austin and his chosen subordinate commander for OIR, Lieutenant General James Terry, USA, both proceeded to cast their impending effort instead as a *land* war, with USCENTCOM's air component relegated solely to providing on-call support to a still only anticipated land counteroffensive yet to come. In a revealing post hoc confirmation of that largely unheeded reality on the ground in Iraq, when General Austin finally presented his envisioned construct for such a land campaign to Secretary of Defense Ashton Carter 6 months later for the latter's approval, Carter immediately saw that the plan "was entirely unrealistic at that time" because it "relied on Iraqi army formations that barely existed on paper. . . . Building the kind of Iraqi force that could retake Mosul would ultimately take the better part of a year."[4]

Assigning a CJTF Commander

Perhaps at least partly due to awareness of that fact, as was later acknowledged by OIR's first deputy air component commander, Major General Jeffrey Lofgren, USAF, the prospective command arrangements for the coming campaign were "hotly debated with the [USCENTCOM] commander over several weeks." Although General Lofgren did not indicate when that back and forth first began, who its main protagonists were, or what spectrum of concerns it addressed, the simple fact that the debate was both heated and protracted would seem to suggest that it centered, among other possible issues, on the ultimate question of whether the strategy for the war's opening round should be land-centric

or air-centric and, directly related to that question, whether the CJTF for the coming fight should be led at the start by an Army general or by an Airman. General Lofgren further acknowledged that "the Air Force was asked to provide manpower to the CJTF and did not do so initially, which [ultimately] shaped the early constructs [for the campaign]."[5] In the end, he recalled, "the [USCENTCOM] commander's going with the choice of ARCENT [U.S. Army Central Command] to plan and oversee it was driven more by comfort [on General Austin's part] and the fact that the air component was not postured to be able to execute the CJTF mission."[6]

Yet there was no reason in principle why USCENTCOM's air component commander could not have been tasked with assuming initial oversight of at least the air portion of the impending campaign and then laying down the essentials for a more appropriate starting course of action both easily and seamlessly within the framework of the existing CJTF structure in Kuwait. Ultimately, what should have mattered most was not the "command and subordinate staff that had [previously] worked and trained together," and that General Austin was most "comfortable" with, but rather what class of expertise and associated skill set would be best suited for the commander ultimately chosen to plan and lead a successful campaign against the unique challenge that IS presented, at least at the start of OIR.[7] That challenge all but begged for a well-targeted air attack plan as the looming campaign's centerpiece.

To be sure, once OIR had evolved from its hesitant air-only start in August 2014 into its more well-developed pace as a land-centric campaign 3 years later, it was entirely natural that the most senior Airmen in its chain of command would have felt that a ground-force general offered the most apropos competency for overseeing such an endeavor. As the third successive Airman assigned as CJTF-OIR's deputy commander for operations and intelligence, Major General Dirk Smith, USAF, recalled in this regard when serving in that capacity from May 2017 to May 2018:

I wonder how the ISF and our partners in Syria would have done at developing the necessary trust and deep partnership with an Airman in lieu of a U.S. Army three-star as the CJTF-OIR commander? The [Army-specific concept that lay at the heart of the campaign's strategy] *requires very close commander-to-commander relationships and a keen understanding of ground schemes of maneuver.*

Adding that the successive Army CJTF-OIR commanders under whom he had served "knew [personally] many of the ISF general officers from their previous multiple combat deployments to Iraq," he stressed that any Airman serving in the same capacity "would need to be deliberately experienced and developed" to a similar high degree in order to be successful.[8]

In a similar vein, Major General Andrew Croft, USAF, who had served under Major General Smith as the deputy commanding general for air in CJTF-OIR's land component and as its Joint Air Component Coordination Element director during the campaign's final phase, likewise recalled:

By the time I got there, the advise-and-assist mission that was being done by the Army brigade up in Mosul was absolutely critical to the fight. It therefore made sense to have the battalion-brigade-division-corps chain of command and processes in place that the Army brought to the battlefield. . . . We tied in the airpower from our positions, but had an Airman commanded the CJTF, we still would have needed the same ground-centric capabilities.[9]

Fortunately for the ultimate success of OIR, its Army-led headquarters by mid-2016 and thereafter—at long last having included an uninterrupted succession of experienced two-star Air Force fighter pilot generals in the key position of deputy commander for operations and intelligence—finally developed a smoothly running battle rhythm in which USCENTCOM's air component figured both centrally and effectively as the sole kinetic contribution to an overall ground-centric war plan. As the third of these senior Airmen, Major General Smith, later pointed out:

Given the great work done by [his Air Force predecessors, Major Generals] *Peter Gersten and Scott Kindsvater, when I stepped into the position, I felt like I was very empowered by the CJTF commander . . . to ensure that "airmindedness" could be in every CJTF senior leader discussion. It also allowed me to provide detailed understanding of issues from the CJTF and subordinate land component commanders' perspective to the* [air component commander and his deputy].[10]

That eventually well-tuned integration of U.S. and coalition airpower as the lead player in OIR's effort against IS, however, was anything but the norm during the campaign's first year. As later explained by Major General Charles Moore, Jr., USAF, who had been the most senior U.S. Airman in Baghdad during the war's initial months by virtue of his posting in the Office of Security Cooperation in Iraq, his organization engaged on a daily basis with USCENTCOM, including with all of its subordinate components and with the Iraqi government. Eventually, he recalled, by around the start of 2015, the Air Force sent Brigadier General John Cherrey, a combat-seasoned A-10 pilot, to OIR's forward headquarters in Kuwait to help plan and direct air operations in its still slowly developing war against IS.

For at least the campaign's first 5 months, however, CJTF-OIR had *no* formal air representation in its command section. Yet during those same first few months, the *only* American combat operations being conducted against IS were from the air, with OIR's Army personnel focused solely on rebuilding what had been lost from the fragile ISF following President Obama's withdrawal of all U.S. forces from Iraq in 2012. That meant that USCENTCOM's only component actually engaged in combat operations against IS was not in command of those operations. In that plainly

dysfunctional situation from an ideal joint-Service perspective, CJTF-OIR's first commander, Lieutenant General Terry, would brief the daily air operations flow via videoteleconference from Kuwait to USCENTCOM's commander, General Austin, sitting in his headquarters back in Tampa, Florida. As Major General Moore later recalled, in that odd briefing arrangement, USCENTCOM's air component commander, Lieutenant General John Hesterman III, participating from his Combined Air Operations Center (CAOC) in Qatar, "was often left with little to say when it was his turn, which usually occurred last."[11] It was not until May 2015, nearly a year into the campaign, when Major General Gersten arrived in position as CJTF-OIR's assigned deputy commander for air. This provided direct senior air representation on Lieutenant General Terry's staff for the first time since the campaign began. In light of that long-delayed move to insert a senior air presence in the CJTF's command section, it should hardly be surprising that the air contribution to USCENTCOM's war against IS was so ineffectual throughout its first year when it came to weakening IS in its most vital strategic center.

Regarding the air component's eventual effort to heighten the airpower focus within CJTF-OIR, the campaign's second successive air component commander, Lieutenant General Charles Brown, Jr., USAF, almost as a first order of business after having reported aboard in that position, moved his Air Support Operations Center from collocation with CJTF-OIR's land component headquartered in Baghdad, which was almost exclusively Iraq-focused, to CJTF-OIR's headquarters in Kuwait so as to achieve a broader airpower focus across that command's entire area of operations, most notably including in Syria as well as Iraq. As to his rationale for that important move, General Brown later recalled, "I wanted to conduct more deliberate strikes in Syria to support the future close fight in Iraq. I often shared with my staff that although Iraq may be first in priority, it was second on my playlist when it came to where I wanted to apply airpower."[12] That perspective and intention, one can fairly state in hindsight, should have been a key part of CJTF-OIR's campaign approach from the very start.

The Lost Opportunity of a More Promising Approach

As a notional alternative to the command structure for OIR that ultimately emerged, what if General Austin had instead picked his air component commander to take the lead, at least at the start of campaign planning, from the first moment USCENTCOM was tasked by the White House to engage IS? Given the realities of the strategic landscape that prevailed in Iraq and Syria in late July and early August 2014, a more promising initial move by USCENTCOM's commander would have been to accept that there would be no sufficiently combat-ready indigenous ground troops in the region for his air assets to "support" in a truly influential way for at least a year, and that until such a reality was finally at hand, he should instead pursue a more logical approach for the interim by designating his air commander as his first subordinate CJTF-OIR commander and duly empowering that Airman to apply his and his staff's collective skills toward determining how best to carry the fight to IS, at least until a true joint and combined air-land campaign was ready to be unleashed with determination.

In a strong seconding motion to such an alternative approach, General Brown later suggested that at least during the campaign's initial stages, as CJTF-OIR's land component was mainly focused on rebuilding the ISF, USCENTCOM's air commander "could and probably should have been designated as OIR's supported commander, with an eventual handover of CJTF-OIR to the most senior ground general once serious offensive land operations were set to begin. This alternative approach would have had the right leadership and expertise in charge more properly aligned with the initial scheme of the campaign."[13] A similar sentiment was offered by an Air Force F-16 pilot who flew in two successive OIR rotations during its largely ineffectual opening round. This Airman remarked that what Army and Air Force leadership within USCENTCOM had *both* failed to recognize in sufficient time was

> *that* [IS] *was a proto-state requiring more than just support to the indigenous ground maneuver elements. It also required a distinct and separate aerial bombing campaign on strategic targets and air interdiction, and this needed to happen right away while the coalition was still gestating. That, in turn, meant duly supporting the embattled Iraqis . . . while concurrently doing our utmost to hurt* [IS's] *warfighting capability with a sustained air campaign. Yet we did the former but not the latter during OIR's pivotal first two years. . . . At a time when the campaign should have been mainly air-centric, it wasn't. Its construction from 2016 onward was probably correct. But its construct at the beginning was flawed.*[14]

On this important count, even retired Colonel Peter Mansoor, USA, who had served as a key advisor to General David Petraeus in Iraq during the latter's eventually successful surge of 2007, suggested that "if this [effort against IS] was going to be just an air campaign [which it most definitely was for U.S. forces during its first 2 years], it would have made much more sense to have an Air Force officer in Baghdad and have him lead the charge."[15] With such more appropriate leadership in place, an Air Force commander for CJTF-OIR at the outset would have had every inclination and opportunity to mobilize the vast intelligence resources at his disposal to take the fullest measure of IS and to undertake the needed initial target system development *before* committing to any ensuing plan for the war's opening round.

Of course, in order to ensure the eventual reconstitution of the ISF to the degree necessary for it to engage IS effectively in sustained land combat, there would still have been a need for CJTF-OIR to interact closely from the effort's first day onward with the ISF's leadership. And that need would have demanded a depth of land-warfare expertise and familiarity with the Iraqi situation

Marines attached to 26th Marine Expeditionary Unit load GBU-54 bomb onto AV-8B Harrier on flight deck of USS *Kearsarge*, supporting Operation *Inherent Resolve*, Arabian Gulf, December 28, 2015 (U.S. Navy/Tyler Preston)

on the ground that *no* Airman could have been expected to offer. However, as David Deptula rightly noted, that role could easily enough have been fulfilled by a suitably experienced two-star Army deputy CJTF commander for land operations with intimate previous connections with his ISF counterparts. "But without an Airman in charge," Deptula added, "there would have been *no* possibility of a strategy being developed from the very start that put the [IS] center of gravity in Syria in the crosshairs as a campaign first priority rather than second priority."[16]

True enough, anyone viewing CJTF-OIR's challenge as it eventually unfolded could rightly conclude that the organizational wherewithal and skills offered by USCENTCOM's air commander would have been ill-suited to render him a compelling choice for effectively overseeing such an air-land campaign endgame. In that regard, the Air Force fighter pilot who served for a year previously as CJTF-OIR's deputy commander for operations and intelligence after the campaign had already been well under way, Major General Kindsvater, reasonably doubted whether an Airman could have effectively led what he called the "multidivision and then corps/two-nation fight" that was being conducted by CJTF-OIR when the needed skills for exercising proper command oversight in such a capacity have never, as he rightly put it, been traditionally part of the Air Force's "functional expertise."[17]

Yet the "multidivision and then corps/two-nation fight" that CJTF-OIR ultimately ended up conducting against IS was not the only alternative available to USCENTCOM for taking on the jihadist movement from the campaign's first day onward. To the contrary, there is every reason to believe that an Airman as CJTF-OIR's initial overall commander might well have chosen a different template for engaging the jihadist threat by pursuing a more air-centric course of action that would not require, at least at the outset, the spectrum of land warfare skills that later would be essential for commanding a preponderant ground force of the sort that ultimately became the centerpiece of OIR. In this regard, Major General Charles Corcoran, USAF, who served as the chief of staff to USCENTCOM's air component in 2013 and 2014, offered one retrospective insight into how an Airman as the overall CJTF commander might have approached the initial planning for the impending campaign in a way substantially different from the route ultimately chosen. Having had a catbird seat in the CAOC from which to observe developments from up close as the jihadist movement first arose, he later recalled that a major reason for OIR's faltering

missteps at the campaign's start was "simply our lack of understanding of the enemy." He then added, "Target system analysis takes time," and USCENTCOM had not done its needed homework before embarking on its Iraq-dominant, COIN-oriented, and land-centric initial response to IS, when what was actually needed was a plan fundamentally different in both nature and level of intensity. "We need to learn this lesson," he insisted, and continued:

We can't wait for a conflict [as we did while IS was first gaining strength throughout Iraq and Syria] *to understand our potential enemies and their critical infrastructure. We need to do this analysis now . . . in peacetime. . . . Once we have that in hand, we can* [then] *develop a campaign to dismantle and defeat* [the enemy] *using all forms of power at our disposal, including airpower.*[18]

Unfortunately, militating against much of a chance of USCENTCOM's having arrived at any such more appropriately focused approach toward engaging IS from the very start, "CJTF-OIR from day one onward was more accurately a U.S. Army Corps headquarters," as the British Royal Air Force's air contingent commander for the campaign later recalled, "and the U.S. Army was more comfortable with Iraq than with Syria because of its previous years there—perhaps an explanation for its delays in executing an effective plan for Syria." To make matters worse, with no formal air representation in the subordinate command structure that USCENTCOM had cobbled together for OIR for at least the campaign's first 5 months, "air was rarely embedded early in CJTF planning and had to fight valiantly to be heard."[19]

An Initial Dearth of Needed Target Intelligence

Of course, to have been most productive from the start, any alternative approach toward countering IS with a principal focus on interdicting its most vital assets on the move would have required USCENTCOM and its air component, along with their organic intelligence and planning organizations, to have stepped out with the greatest dispatch toward generating the needed wherewithal to conduct the requisite target system analysis and weaponeering for underwriting such a campaign. On this count, any number of OIR principals have hastened to stress how USCENTCOM lacked the needed inputs at the campaign's start to conduct such an undertaking. For example, in pushing back against any intimation that "we had a ton of options to move more rapidly in Syria," the Special Presidential Envoy for the Global Coalition to Counter the Islamic State of Iraq and the Levant, Brett McGurk, pointed out that "we had nothing to work with in Syria and very little fidelity as to what was happening on the ground" in that country during OIR's first halting months.[20] Similarly, Vice Admiral Fox noted "the absolute lack of targeting intelligence" needed during OIR's initial phase to underwrite an effective interdiction campaign.[21]

Yet there was ample testimony from line operators actually engaged in the fight that the needed information was there all along—had it only been marshaled, assessed, and disseminated in a timely way. As the above-quoted F-16 pilot later recalled:

During each sortie during the campaign's first month, we would watch all sorts of [IS]*-related activity going on in Syria. . . . The targets were definitely out there for us to kill. I saw them day after day. . . . No one listened to us. True, we were unsure going into Syria at the time, because it was new and different. . . . But had we acknowledged* [IS] *for the proto-state entity that it was, we could've moved swiftly on these targets of opportunity despite all the other issues with ground fidelity.*

Clinching his argument, he added,

The overall strategy did not need to be a new one. It simply should have been: Find their center of gravity and hit it quickly and accurately. Part of OIR was admittedly trying to get the Iraqis back on their feet. But at the same time, we should have pulverized [IS] *leadership and cash flow at the beginning. We eventually got there, but we lost some serious opportunities up front with blatantly identifiable targets . . . in which we could have done some serious damage and saved lots of lives. We flew over such targets in Syria day in and day out with bombs on our jets, reported them to everyone we could, and still we did nothing about it.*[22]

General Brown himself later remarked, "One area I was pushing for was target system analysis to get to the 'so what' and target more effectively. I didn't want to wait for a product that was six months or so in the making but instead wanted a 50 percent solution so we could start striking in a more deliberate manner."[23] Had such a more energetic response been undertaken by USCENTCOM in a sufficiently timely way at the campaign's start, General Brown's more promising approach, applying more permissive ROEs, could have caused far more serious harm to the movement's most valued assets, and at an earlier stage of the campaign had IS been correctly assessed and engaged from the outset as a proto-state rather than an insurgency.

Opportunity Costs

Viewed in hindsight, the disappointing early returns yielded by the halting air war that unfolded against IS for more than a year was mainly a result of the Obama administration's obsessive top-down micromanagement of the campaign and its insistence at the bombing's start on oppressive restrictions on attackable targets in the vain and totally unrealistic hope of achieving zero civilian fatalities. However, it also was a predictable result of USCENTCOM's suboptimal command arrangement and resort to an inappropriate COIN strategy from the campaign's first moments onward. After what Secretary Carter later well characterized as USCENTCOM's "ad hoc launch" of its initially flawed war plan in early August 2014, the vast oil reserves in Iraq and Syria that were being controlled and exploited by IS

KC-135 Stratotanker pilot with 340th Expeditionary Air Refueling Squadron preflights aircraft before taking off from base in U.S. Central Command area of responsibility in support of mission conducting airstrikes in Syria, September 23, 2014 (U.S. Air Force/Matthew Bruch)

for copious financial gain were not targeted and struck until a full 15 months later, offering yet another testament to the downside costs of the misguided gradualism and inappropriate focus of USCENTCOM's initial approach to its counter-IS effort.[24] That faulty mindset and the campaign plan that naturally flowed from it gave the jihadist movement some $800 million a year in black market revenue that allowed it to continue recruiting Islamist zealots from around the world and to continue terrorizing the Iraqi and Syrian noncombatants who were caught in its grip.

In marked contrast, a more productive strategy would have concentrated instead on interdicting IS's flow of oil and other vital supplies from the campaign's first moments onward rather than wasting valuable sorties in a misprioritized air "support" endeavor flown over Iraq's cities mainly to serve the advise-and-assist interests of Army generals in Baghdad who, in fact, commanded *no* forces actually engaged in the fight. Had such an alternative approach been pursued instead by CJTF-OIR from the campaign's start, the vast majority of USCENTCOM's early air surveillance operations would have been flown not over Iraq's urban areas but, as Major General Moore later put it, "across the border in Syria and in the Anbar desert[,] building situation awareness for our interdiction attacks. Imagine the Ho Chi Minh trail, but in a desert!"[25]

By and by, more determined new leadership in the White House by the start of 2017, driven by a deeper commitment to ending the war decisively, issued new directives to USCENTCOM for the latter to lift its most burdensome impediments to more rapid progress toward that reformulated goal. That pivotal top-down change soon made the crucial difference that finally allowed well-prepared indigenous friendly Iraqi and Syrian ground troops, supported by unerringly effective coalition airpower, to sweep IS off the battlefield in both Iraq and Syria.

Some Implications Worth Pondering

In the end, despite its slow and ineffectual start, OIR turned out to have been another successful exercise in joint and combined force employment in which U.S. and coalition airpower ultimately overwhelmed IS with an invincible monopoly of asymmetric aerial firepower, thereby ensuring that eventually well-endowed and highly motivated Iraqi and anti-regime Syrian ground troops, supported by U.S. SOF teams and JTACs, would ultimately crush the once-formidable jihadist movement. That performance offered a compelling testament to the intrinsic leverage

of today's American air posture in all Services once freed from the restraints imposed by flawed initial leadership directives that misunderstood the enemy as a reborn Iraqi insurgency and that wrongly insisted on ROEs meant for a different kind of war.

Nevertheless, when viewed from an overall strategic perspective, the Obama administration's and USCENTCOM's needlessly prolonged Operation *Inherent Resolve* was oxymoronic in both concept and execution throughout its first year or more. Although USCENTCOM had no hand whatever in occasioning the inhibiting gradualism that was forced on it at the campaign's start by the administration's unrealistic insistence on zero civilian casualties, that command should have immediately begun its response planning after having been tasked to engage IS by first understanding the movement for what it actually was and then by regarding it—and by engaging it with real rather than merely avowed "inherent resolve"—as a self-declared state in the making, featuring targetable state-like characteristics. A related misstep in USCENTCOM's initial goal-setting was arguably its decision to secure Iraq first by tasking its air component to devote most of its assets exclusively toward providing dedicated air "support" to a still-not-combat-ready ISF instead of reaching out concurrently to strike IS's core equities in Syria that bore more directly on the movement's capacity for sustained fighting.

Finally, even if it was not to be for General Austin to have chosen his air commander to head up CJTF-OIR at the campaign's start, it was essential that USCENTCOM's air component, once it became clear that the rise of IS would eventually demand a determined U.S. response, move with the greatest dispatch toward crafting an option that would most fully exploit the strategic leverage offered by U.S. and coalition airpower. Yet as Lieutenant General Deptula remarked tellingly after the campaign was over, the apparent absence of any such consideration in USCENTCOM's initial planning "occurred in part because its air component, by all outward signs, did not effectively argue for such a more promising course of action."[26] At a minimum, as Major General Croft later reflected in this regard, "we [in the air component] clearly should have put an Airman . . . into the CJTF upper-echelon staff earlier."[27] Commenting for his part on this lost opportunity for USCENTCOM's air component while IS was still gestating in Iraq and Syria, retired General Charles Horner, USAF, the overseer of USCENTCOM's casebook air offensive that largely occasioned the successful outcome of Operation *Desert Storm*, stressed the criticality for Airmen in any joint warfighting headquarters to always "think ahead of their non-air-minded counterparts and superiors, lead them to understand that they are working the problem as those ground-oriented players view it," and persuade the latter whenever appropriate that "there is a better way."[28] Fortunately, such a response eventually gained effective traction within USCENTCOM's air component and helped to produce OIR's winning result in the end. **JFQ**

Notes

[1] Vice Admiral Mark Fox, USN (Ret.), email message to author, August 9, 2020.

[2] Comments provided by Colonel Steven Gregg, USAF, October 23, 2018.

[3] Fox, email message to author.

[4] Ash Carter, *A Lasting Defeat: The Campaign to Destroy ISIS* (Cambridge, MA: Belfer Center for Science and International Affairs, October 2017), 14.

[5] Comments provided by Lieutenant General Jeffrey Lofgren, USAF, March 5, 2019.

[6] Ibid.

[7] Ibid.

[8] Major General Dirk Smith, USAF, email message to author, April 1, 2019.

[9] Major General Andrew Croft, USAF, email messages to author, January 3 and January 10, 2019.

[10] Smith, email message to author.

[11] Major General Charles Moore, Jr., USAF, email message to author, April 24, 2019.

[12] General Charles Brown, Jr., USAF, email message to author, July 5, 2019.

[13] Ibid.

[14] Major Greg Balzhiser, USAF, email message to author, August 8, 2019.

[15] Quoted in Matthew Jamison, "From Air War to Ground War: The Obama Administration's Evolving Campaign Against ISIS and the Assad Regime," *Strategic Culture*, June 24, 2016, available at <www.strategic-culture.org/news/2016/06/24/from-air-war-ground-war-obama-administration-evolving-campaign-against-isis-assad-regime/>.

[16] Lieutenant General David Deptula, USAF (Ret.), email message to author, April 1, 2019.

[17] Major General Scott Kindsvater, USAF, email message to author, August 5, 2018.

[18] Major General Charles Corcoran, USAF, email message to author, April 22, 2018.

[19] Air Vice-Marshal Johnny Stringer, Royal Air Force, email message to author, April 16, 2018.

[20] Brett McGurk, email message to author, April 18, 2019.

[21] Fox, email message to author.

[22] Balzhiser, email message to author.

[23] Brown, email message to author.

[24] Carter, *A Lasting Defeat*, 18.

[25] Major General Charles Moore, Jr., USAF, email message to author, April 23, 2018.

[26] David A. Deptula, foreword to *Airpower in the War Against ISIS*, by Benjamin S. Lambeth (Annapolis, MD: Naval Institute Press, January 2021).

[27] Major General Andrew Croft, USAF, email message to author, August 12, 2020.

[28] General Charles Horner, USAF (Ret.), email message to author, August 31, 2020.

Air Force pararescuemen assigned to 83rd Expeditionary Rescue Squadron load simulated casualties on board CH-47F Chinook, flown by members of Army Task Force Brawler, during personnel recovery exercise, Afghanistan, March 6, 2018 (U.S. Air Force/Gregory Brook)

The Future Joint Medical Force Through the Lens of Operational Art

A Case for Clinical Interchangeability

By Joseph Caravalho, Jr., and Enrique Ortiz, Jr.

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Today there is little dispute over the constant nature of war. Over time and throughout history, however, the character of war has been fluid. In a recent strategic assessment, General Joseph F. Dunford, Jr., former Chairman of the Joint Chiefs of Staff, described the future security environment as both complex and uncertain, with adversarial competition and overt conflict being transregional, multidomain, and multifunctional in nature.[1] The joint force has adapted to keep pace with this new character of war, although doing so has been no easy feat. The U.S. military has been challenged recently by burgeoning and worsening regional instability driven by both state and nonstate actors. The United States can justifiably expect contested domain dominance in any future military operation. Additionally, the current operational tempo—with no clear end in sight—is affecting the

Marine aids Royal Thai sailor with simulated casualty while participating in mass casualty evacuation drill during exercise Cobra Gold 2020, at Hat Yao Beach, Sattahip, Kingdom of Thailand, February 27, 2020 (U.S. Marine Corps/Hannah Hall)

military's equipping, training, and modernizing posture. Indeed, the Department of Defense (DOD) has prioritized pressing readiness issues—namely lethality and modernization, among others.

These collective problem sets drove the Joint Staff to implement the doctrinal approach of globally integrated operations.[2] The key concept is central to the name: integration. Under this construct, an employed joint force must quickly integrate capabilities across all domains and organizations, implement global agility while operating in small footprints, exercise flexibility, leverage partners, enable speedy decisionmaking, and operate with disciplined discrimination to decrease unintended consequences.

Politically, the American population has tolerated the fiscal cost of conflicts for the past two decades, in large part because U.S. interests were safeguarded while human casualties remained low. This latter point proved paramount to maintaining the American will to endure, as the collective population agonized over every warfighter lost in combat.

The joint health enterprise (JHE)—commonly referred to as the military health system (MHS)—has been key in driving recent combat casualty rates to the lowest in the Nation's history. However, with the advent of a new, uncertain future security environment, the JHE faces potentially overwhelming obstacles that threaten a reversal. It therefore must contemplate national strategic redirection through novel and innovative means.

In the 2017 National Defense Authorization Act (NDAA-17), Congress not only acknowledged military medicine's unmatched wartime successes,[3] but also conveyed deep frustration with the MHS overemphasis on the peacetime health care delivery benefit at the expense of a strengthened operational joint medical force readiness.[4] This comprehensive reform was informed by the 2015 Military Compensation and Retirement Modernization Commission Report, which recommended DOD ensure Servicemembers receive the best possible combat casualty care while also increasing access to and value of home station health care.[5] This report also affirmed that joint military readiness must be proficient in delivering both routine health care and combat casualty care in operational environments.[6] A former Deputy Secretary of Defense recently directed the Under Secretary of Defense for Personnel and Readiness, with Joint Staff support, to work with the Services to develop an implementation plan to meet NDAA-17 MHS reform requirements. His intent was to reform the MHS from a collaborative Service-centric health system to a

high-performing integrated health system focused on joint readiness.[7] This process has continued through several NDAA iterations intended to shape the future direction of DOD medicine.

The Operational Environment

In anticipated conflicts of the future, geographic distance will pose an operational challenge. To expand its reach against widely dispersed unconventional military threats, the joint force has leveraged small, disaggregated unit employments. Ground commanders have had to optimize their warfighting capacity through modular, tailored employments and effective use of partner capabilities.

The future security environment will impact the joint medical force in this same way. The force therefore must support warfighters through globally integrated health services (GIHS)—the strategic management and global synchronization of joint medical assets.[8] Key to this approach is the Services' collective ability to deploy tailorable, interoperable, and networked medical forces. In turn, these joint medical forces must efficiently and effectively combine and synchronize their capabilities to best support joint operations. Medical support, like logistic support, must factor in geographical considerations as much as—if not more than—the size of the joint force's population at risk.

The Problem

Limited resources, unmet requirements, and the accompanying geographic combatant command (GCC)–Service tensions are not uncommon operational challenges. When viewed separately, medical operations are no different. The Joint Concept for Health Services highlighted this dilemma in its problem statement: "How can the joint force provide comprehensive health services to deployed forces in an operating environment characterized by highly distributed operations and minimal, if any, pre-established health service infrastructure?"[9]

At the root of the GCC–Service tension are the ground commanders' requests for minimum-sized medical units capable of surgical resuscitation. Anything more than this small size would often be larger than the unit being supported. Even with the ad hoc creation of smaller surgical teams, the Services have strained to meet increasing operational demand. This gap has created contentious sourcing efforts and, at times, unfilled, validated requirements. This shortfall has also proved unacceptable to the collective endstate. The GCCs have exercised innovative approaches to mitigate this lack of contingency surgical support, including increasing the time standards for evacuation, partnering with coalition medical assets, and canceling specific military operations.

Another source of Service tension is the concomitant requirements of delivering health care at home stations and providing operational medical support in deployed settings. In fact, Congress has acknowledged this dichotomy, noting that peacetime health care comes at the expense of medical force readiness.[10] In NDAA-17, Congress conveyed its concern that the Services were risking their medical relevancy to operational readiness. As mentioned, the Services' lack of agility to tailor small-unit capabilities has threatened their ability to use limited resources to meet an ever-increasing demand.

Directed NDAA-17 reforms, albeit culturally challenging, have presented the Services the opportunity to rightsize their force structure for the specialties and capabilities forecast to meet current and future joint force requirements. This ongoing opportunity lends itself to improving global force management processes, with more agile business rules friendlier to tailoring of forces into small-unit employments.

The Art: Innovative Means of Integration

The JHE's strategic endstate is a high-performing integrated military health system. In turn, the joint force implements GIHS as the desired military endstate. Service surgeons general take this concept into account when executing their respective roles to recruit, organize, train, and equip medical forces for deployment. Ultimately, the joint medical force provides a fully capable, integrated, and synchronized medical capability to meet the commander's operational needs.

Integration is the most critical component to optimize operations and capacity. Three distinct, invaluable ways to deliver effective integration are *interoperability*, *interdependence*, and *interchangeability*.

Joint Publication 3-0, *Joint Operations*, defines *interoperability* as the ability to act together coherently, effectively, and efficiently to achieve tactical, operational, and strategic objectives.[11] For the joint medical force, interoperability occurs at all three spheres of influence—tactical, operational, and strategic—and is guided by joint planning and standardization.

Interdependence is the purposeful reliance by one Service on another Service's capabilities to maximize the complementary and reinforcing effects of both—that is, synergy.[12] Joint interdependence is essential for joint effectiveness. A good example of interdependence is the continuum of care, in which ground-based hospitalization is interdependent with Air Force strategic patient movement capabilities. Essentially, interdependence obviates the need for each Service to be self-sufficient, thus eliminating costly redundancy.

Although *interchangeability* is not a doctrinal term, in the military setting, the word can be described as an innovative and agile way to readily exchange forces that possess equivalent capabilities—that is, capable of changing places. Indeed, the authors' contention is that health professionals in uniform are among the closest thing to a military commodity. (Another example is the military Catholic priest: the uniform does not matter; mass will always be the same.) Within military medicine, clinicians train to the same national standards in their respective internships, residencies, and fellowships. Clinical knowledge, skills, and abilities are the same for any specialist or subspecialist, regardless of underlying Service affiliation.

Service medical assets can and should operate interchangeably whenever and wherever appropriate to support the mission at hand. Although the environment and operational conditions differ among the Services' primary warfighting domains, this situation could be easily overcome through predeployment training. Any Army, Navy, or Air Force clinician could execute his or her clinical skills in any warfighting domain under appropriate operational command and control. Rather than the requirement to permanently assign clinicians to a particular Service or medical unit, clinicians would simply augment to a Service-aligned medical unit most appropriate for the warfighting domain. The guiding precept should be to avoid unnecessarily aligning clinical assets by Service to that of the supported operational force, since doing so adds complexity without any accompanying advantage.[13] This recommendation is not a new operational concept for medical assets; its overwhelming success has been best demonstrated in North Atlantic Treaty Organization (NATO) Role III settings—that is, military treatment facilities—both at home station and while deployed.[14]

To achieve GIHS, a joint medical force must operate with a baseline of common knowledge, skills, and abilities (KSAs) that enable all three methods of integration described above. These common clinical KSAs do not limit Services from having additional Service-unique KSAs. Other means to achieve global integration include joint developed medical leaders; interoperable Service capabilities guided by common standards and procedures; extensive interagency, multinational, and private partnerships; cross-domain synergy through joint medical force development; and global coordination.

The Risk

Strategically, interchangeability effectively provides depth by increasing supply-side capacity—that is, the number of clinical capabilities available for deployment. Even within the theater of operations, integrated formations give operational commanders agility and timely maneuverability. Alternatively, relying solely on doctrinal unit employment through a formal request for forces may well prove untimely for the joint force.

This type of Service-agnostic clinical employment flexibility may introduce operational risks. At the tactical level, Service-unique characteristics make wholesale integration impractical. The joint force could mitigate risk by aligning medical units to the Service typically affiliated with the intended warfighting domain, namely, Army with land, Navy with sea, and Air Force with air. Tactically, sound command and control of these units would be delivered by Service-aligned leadership; it is only the clinical expertise that is interchangeable in this model. Practically speaking, over time, NATO Role II settings—surgical resuscitation sites—may represent common use of clinically interchangeable capabilities among the Services.[15]

Cultural resistance to change is another risk to the future joint medical force. Without transformation, however, the force faces a future of irrelevance to the warfighter of tomorrow. If this force is not ready or able to tailor itself to meet inherent requirements, it risks not integrating effectively, which threatens mission failure: higher casualties and jeopardized strategic security objectives. At a time of a supply-demand mismatch among deployable surgical resuscitative capabilities, it is imperative for the military medical community to explore and adapt innovative ways to support the employed joint force and its populations at risk.

Future military operations require modular surgical resuscitative capabilities to support small, widely dispersed, and disaggregated unit deployments. Current integration efforts and associated mitigations are not enough to meet the joint force need. Even when considering all available clinical assets within the three Services, there remains an overwhelming supply-demand mismatch among military medical assets. Because clinical skills and competency standards are the same across the board, Service force providers should combine specialized medical and surgical assets in an interchangeable fashion to meet deployment requirement demands. This interchangeability could positively address risk concerns and provide commanders in the field with the comprehensive medical services they need to fight and win. **JFQ**

Notes

[1] Joseph F. Dunford, Jr., "Strategic Challenges and Implications," *Joint Force Quarterly* 83 (4th Quarter 2016), 2–3.

[2] *Capstone Concept for Joint Operations* (Washington, DC: The Joint Staff, 2012), iii.

[3] *National Defense Authorization Act for Fiscal Year 2017 Report (to accompany S. 2943)*, Senate Committee on Armed Services, S. Rep. 114-255, 114th Cong., 2nd sess., 2016, 173, available at <www.congress.gov/congressional-report/114th-congress/senate-report/255/1?overview=closed>.

[4] Ibid.

[5] *Report of the Military Compensation and Retirement Modernization Commission: Final Report* (Washington, DC: Department of Defense, January 2015), 4.

[6] Ibid., 58.

[7] Ibid., 7.

[8] *Joint Concept for Health Services* (Washington, DC: The Joint Staff, 2015), ii.

[9] Ibid.

[10] *National Defense Authorization Act for Fiscal Year 2017 Report*, 173.

[11] Joint Publication (JP) 3-0, *Joint Operations* (Washington, DC: The Joint Staff, 2013), GL-10.

[12] JP 1, *Doctrine for the Armed Forces of the United States* (Washington, DC: The Joint Staff, 2017), I-2.

[13] Ibid., III-6.

[14] See "Chapter 16: Medical Support," in *North Atlantic Treaty Organization* [NATO] *Logistics Handbook* (Brussels: NATO, October 1997), available at <www.nato.int/docu/logi-en/1997/lo-1610.htm>.

[15] Ibid.

F-35B Lightning II fighter aircraft with Marine Medium Tiltrotor Squadron (VMM) 265 (Reinforced), 31st Marine Expeditionary Unit, takes off from flight deck of USS *America* during air defense exercise, Philippine Sea, March 23, 2020 (U.S. Marine Corps/Isaac Cantrell)

Sustaining Relevance

Repositioning Strategic Logistics Innovation in the Military

By Paul Christian van Fenema, Ton van Kampen, Gerold de Gooijer, Nynke Faber, Harm Hendriks, Andre Hoogstrate, and Loe Schlicher

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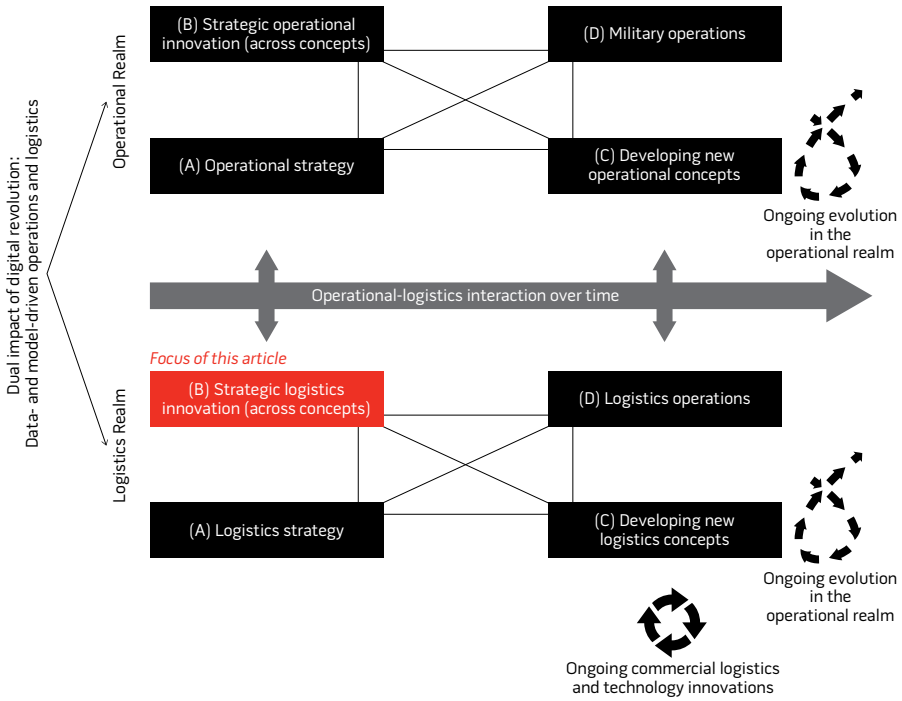
Military organizations tend to think about their overarching strategy in two ways: how their organization will remain relevant and which future operations they must be able to conduct.[1] In the information era, military organizations struggle with the "design capabilities that will offer . . . credible strategic options and then the ability to win, through fighting smarter."[2] Building on the revolution in military affairs programs, a new era of digital innovations in the commercial realm underpins the U.S. National Defense Strategy and Third Offset Strategy to explore the use of new technologies for the military.[3] While new operational concepts such as hyper war and kill webs are emerging, attention to the strategic element

Figure 1. Positioning Strategic Logistics Innovations



of innovation seems difficult to realize regarding military logistics.[4] Strategic innovation concerns processes of proactive and systematic thinking about gaps that an organization can fulfill by developing new game plans.[5]

In the U.S. military, the Third Offset Strategy has major and unexplored implications for logistics. New technologies have crossover effects for operations and logistics. For instance, drones are becoming part of new operations, and they can support logistics, such as picking up wounded soldiers or secretly resupplying special operations forces. New technologies, however, need new versatile support networks. They also incur cyber risks, particularly in an antiaccess/area-denial environment.[6] Innovations powered by crossovers between operations and logistics cannot be addressed with present routines.

In the military logistics domain, innovations are mostly organized in a reactive and stovepiped manner.[7] Moreover, within the Department of Defense (DOD) or a ministry of defense (MOD), responsibility for military logistics is allocated to myriad organizations. On the one hand, there are intra-Service logistics, such as the U.S. Army Logistics branch, and on the other hand, cross-Service shared entities, such as the U.S. Transportation Command, the Office of the Under Secretary of Defense for Acquisition and Sustainment, and the F–35 Lightning II Joint Program Office. Other nations have a similar collection of logistics organizations. We focus on this entire collection of organizations, as we are interested in military logistics as a function of the military and strategic innovation as a process vital to sustaining an edge over relevant opponents.

Military logistics innovation lacks a cross-service strategic picture. It hardly enjoys the backing of a strong military academic research community, with the exception of historical logistics studies.[8] The operational domain by comparison performs better in this respect, with multiple think tanks, DOD units, and universities constituting a vibrant intellectual community. To sustain relevance in the digital era, we need insight into effective strategic logistics innovation processes, including instruments for stimulating and synergizing micro-innovations.

This article contributes to the ongoing challenge of strategically rethinking logistics for the military, but not by proposing a new concept for the digital era—that is, the *what*. Since these concepts rapidly change, this article instead emphasizes the process side—the *how*. Instead of talking about specific concepts, such as forward floating depot or distribution-based logistics, this article is concerned with strategic logistics innovation as a *process of coordinating the development of new logistics concepts*.[9]

The digital era requires attention to strategic innovation in both the operations and logistics realms (see figure 1). We embed strategic innovation in both realms in a model that includes strategy, development of new concepts, and operations.[10] Focusing on strategic logistics innovation, we argue that these realms should interact more intensely in the digital era; the logistics realm must leverage commercial logistics and technology innovations.[11] Specifically, strategic innovation is required to coordinate multiple micro-cases of concept development.

We propose collaborative services and innovation to connect multiple problem-solving areas and process multiple trends. *Collaborative* denotes interaction among stakeholders involved in different problem-solving areas. *Services* in this context are not organizational entities such as the Navy, but interactions aimed at value contributions—for example, technology as a service.[12] *Innovation* concerns the development of new products or procedures. Taken together, collaborative services and innovation stress the importance of a vibrant military logistics community that is externally connected. We propose interventions that accelerate concurrent development of new operational and logistics concepts. These interventions enable logistics capability development for new generations of warfare.

Military Logistics: Beyond "You Ask, We Deliver"

Logistics are planning processes for implementing and controlling the efficiency and effectiveness of transpor-

Sailors move away from MH-60S Sea Hawk helicopter assigned to "Eightballers" of Helicopter Sea Combat Squadron 8 as it lifts cargo from flight deck of USS *Theodore Roosevelt* during replenishment-at-sea with USNS *Henry J. Kaiser*, Pacific Ocean, July 1, 2020 (U.S. Navy/Erik Melgar)

tation and storage of goods from the point of origin to the point of consumption. Future autonomous systems are increasingly part of the logistics equation. This reality leads to an extended definition of military logistics as activities required for the following:

- procuring military organizations' physical goods (for example, supply chains and military mobility, among others); acquiring people and future autonomous systems and administrating and moving these entities toward, within, and out of a theater[13]
- accommodating the military all over the world (for example, facilities and services for people and future autonomous systems)
- ensuring soldiers, and future autonomous systems, receive and use relevant commercial and military technology for their jobs (for example, technology management and maintenance).

Even in the era of cyber information warfare, logistics remain relevant to human warfighters and physical resources. Generally speaking, logistics connect both intent and delivery. While standard logistics enable commercial businesses to outperform competitors on services and costs, the objective of military logistics is to serve user demands with acceptable costs and capital use in mind. The military logistics perspective is broader, comprising both peacetime logistics and support for on- and offshore operations, planned and unplanned.[14] This perspective must also establish, organize, and run lines of supplies so armies can move and fight. The primary objective of military logistics is to enable and sustain a specific state of preparedness for war at the lowest possible overall cost. Thus, the metric for military logistics success is readiness—*not* profit.[15] More specifically, military logistics is required to operate in a cost-efficient mode during peacetime, and then transition to a posture wherein effectiveness is paramount to the secondary consideration of cost. After all, a military conflict does not come with the luxury of second chances afforded to business competition.

Opportunities and Challenges

Increasingly, organizations focus on new opportunities stemming from advanced technologies as a mode for changing logistics.[16] In launching new establishments such as the DOD Joint Artificial Intelligence Center, organizations leverage artificial intelligence (AI) for coordinating—in a responsive manner—learning, predicting, and innovating.[17] For example, during the COVID-19 pandemic, the Joint Artificial Intelligence Center "has built

Marine refuels AH-1Z Viper at forward arming and refueling point during Integrated Training Exercise 1-21 at Marine Air Ground Combat Center Twentynine Palms, California, October 16, 2020 (U.S. Marine Corps/Zachary Zephir)

a prototype AI tool that uses a wide variety of data streams to predict [infection] hotspots and related logistics and supply-chain problems."[18] Military organizations want to optimize support for real demand or underlying needs for pivotal functions, such as transportation, ammunition, maintenance, health, and cleaning.

Traditionally, military logistics has been affected by operational innovations aimed at information advantage and coordination and execution of nonkinetic effects. In an inverse manner, logistics could shift to an innovative-challenging role (for instance, logistics could be motivated not to support fuel-consuming energy production systems primarily, but instead favor alternative energy sources to make bases cheaper, more independent, and more environmentally friendly).[19] Or logistics could sustain special operations forces with intelligent drones in ways that inspire new operational concepts. Therefore, interaction between operations and logistics could become more reciprocal, as depicted in figure 1.

Future operations are likely to involve multiple domains and focus on critical infrastructures (some without clear geographical sites), symbolic-meaning networks, and urban areas. Success will depend on data integrity, as well as decision and information superiority, chiefly the distinction between real and fake information. As stated during a U.S. Senate hearing on the future of warfare, "Great Powers can and will fight across all the domains. This will present new threats in areas where we've had unfettered access."[20] The present task is to prepare the military for operations that fluidly shift across domains or engage parallel domains, activating different kinetic and nonkinetic technologies and associated logistics processes. This task represents a next-level challenge for joint operations in terms of integration. Relatedly, the military needs strategic logistics innovation to develop coherent platforms capable of such seamless activation. Logistics, therefore, needs to be brought into the joint strategic environment and integrated into joint strategic planning.

A seamless blend of human intelligence and AI will require highly versatile command and control to direct "a fluid transition from one operation to another."[21] Semi-autonomous swarms of technologies will be able to operate with unprecedented levels of precision and flexibility. Military organizations collaborating with partners such as Microsoft and Amazon will leverage innovations in the commercial sector.

These operational projects, however, lack strong intellectual counterparts on the logistics side, which results in disconnected logistics–information technology

infrastructures and suboptimal logistics support for novel operations. Logistics often does not have the attention of senior commanders, who underestimate the complexity of military logistics innovation and overestimate the usefulness of commercial services. New technologies such as AI become relevant when they support strategy and operations—which senior commanders are very interested in. Logistics performance increasingly depends on technological innovations,[22] while at the same time physical-cyber vulnerabilities of logistics systems and processes themselves are drawing more attention.[23] Opportunities are emerging to better predict technology availability and logistics demand, as well as to confirm information reliability. This ability translates into enhanced precision, speed, and operational continuity. In addition to these technology-induced opportunities, logistics changes in an organizational sense. In a departure from the traditional in-house approach, logistics transforms into cross-organizational supply networks.[24] This change introduces, in addition to new technologies, new challenges when military organizations are required to work with their military counterparts or businesses.

Current Practice

Current logistics within military organizations faces internal and external problems. Internally, military logistics organizations tend to rely on concept development that sequentially follows operational concept development. Logistics is typically understood in terms of fixed concepts and tends to be fragmented across multiple decentralized organizations. This fragmentation stems from the combination of specific Services (for example, Army, Marines), logistics autonomy, and economies of scale (for example, central purchasing and provisioning of similar categories of products and services). As a result, logistics often focuses on reactive, plan-based execution rather than innovation-oriented strategic exchange with operational and external partners. Some even argue that "civilian logistics has surpassed military logistics."[25] Military organizations struggle with the prolonged time—often multiple decades—required to develop, acquire, absorb, and use and maintain new technologies, including soft technologies such as new logistics concepts developed elsewhere (for example, last-mile logistics concepts). This situation widens the gap between logistics and the fast-moving operational organization that it serves.

Externally, logistics innovation involving outside partners faces multiple hurdles along the way. For example:

- Military organizations collaborating with national or international partners face difficulty when trying to collectively improve networked logistics. Problems include collaboration challenges, turf wars, as well as learning and mutual adaptation.[26]
- New concepts do not guarantee success. For instance, efforts to change relationships with suppliers toward performance-based logistics suffer from deteriorating performance and control problems.[27] Laudable initiatives such as the North Atlantic Treaty Organization's Operations Logistics Chain Management project struggle with nations' willingness to share logistics information and to participate in collective responsibility.
- Innovative concepts for logistics collaboration are typically frozen or not executed in line with their original intention. An example of such drifting is a European pooling arrangement that introduced using spare military aviation capacity, replicating similar initiatives in, for example, the airline industry and electricity market.[28] At the network level, an optimal utilization rate of assets can be realized. However, the planners' strategy shifts over time toward a more nationally oriented perspective.

These internal and external challenges for military logistics organizations call for changes to innovation processes in order to render them more strategic. How can military logistics organizations break through crippling inertia to create a dynamic logistics function that relates to both operational efficiencies and strategic flexibility? Presently, the unstructured and fluid nature of modern warfare cannot be catered to.[29] Especially in the digital era, "you ask, we deliver"—as a unilateral customer-supplier relationship—will not do the job in terms of logistics innovation and future logistics services. Both collaborative services and innovation imply a tighter link to related problem-solving areas in order to ensure relevant capability development.

Trends and Effects

Several trends influence the networked problem-solving required for capability development, including military logistics capabilities. We organize these trends based on their effects.

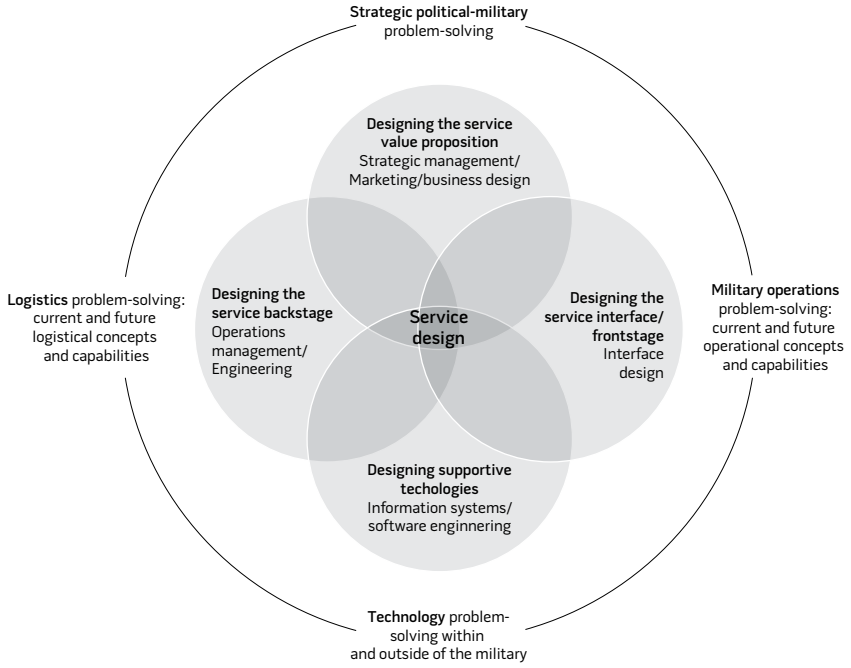
Actors. The first effect stems from automation and changes to weapons systems. Other military tasks are increasingly executed by networked semi-autonomous or remotely controlled technologies.[30] Moreover, the qualities of weapons systems continually change in terms of enhanced complexity, digitization, network capabilities, and frequency of (modular) updates. These two trends lead to a theater with fewer people on the battlefield but with networked, advanced technologies tied to military sustainment organizations and industries remotely monitoring and updating their technologies in the background.

Spatial Dimension. The second effect concerns the unprecedented scale and speed of future warfare. New technologies truly lead to the "death of distance." Examples include hypersonic missiles, as well as command and control at great distances, including outer space. These trends lead to future operations and enabling logistics that are extremely mobile and can link globally distributed conflicts in short timespans.

Virtualization. The third effect concerns the digitization of operations and their influence. With virtualization, warfare and targeting partially shift to nonphysical domains or multidomains. Logistics as physical services by real people no longer seems relevant. However, the technologies required for digital operations will have traditional logistics

Figure 2. Service-Centric Foundational Approach to Interdependence of Problem-Solving Modes

(Original model in gray from Patrício and Fisk).



Source: Lia Patricio and Raymond P. Fisk, "Creating New Services," in *Serving Customers: Global Marketing Perspectives*, ed. Raymond P. Fisk, Rebekah Russell-Bennett, and Lloyd C. Harris

needs such as energy and maintenance/update services.

Radical Renewal of Production and Logistics. The fourth effect concerns the military intelligently sensing needs, and developing and producing technologies and parts, in a highly customized and flexible manner. Hence, smart production and logistics alter production chains. Products are composed of interchangeable modules, and their digital components are frequently updated, such as the technology in Tesla cars. Additive manufacturing decentralizes production capabilities and eliminates several spare parts in supply chains.

Cross-Domain Fluidity. The fifth effect concerns the increasing number of domains in warfare, which calls for cross-domain operations and logistics command and control. Operations become not only networked but also unanimously effective across domains.[31] For instance, the Defense Advanced Research Projects Agency's Adapting Cross-Domain Kill-Webs program "will assist users with selecting sensors, effectors, and support elements across military domains . . . to form and adapt kill webs to deliver desired effects on targets."[32] Each domain's logistics challenges must be considered in conjunction with the others. Multimodal transportation, for example, can leverage capabilities associated with land, sea, air, and space.

Interdependence, Services, and Networked Problem-Solving for Innovation

Interdependence of strategic political-military, military operations, logistics, and technology problem-solving is well acknowledged in command and control.[33] This interdependence takes three forms: political control processes, information interdependence for coordination (for example, an operation generates required logistics information, logistics performance determines operational capabilities, and operations trigger demand for new technologies), and services. Digitization has increased the role of the third form—services—leading to increasingly connected and advanced platforms spanning multiple levels. In the commercial world, service systems are conceived as integrated approaches for connecting strategies and operations, with the latter including technology, resources, and logistics. As a mental exercise, a customer could be replaced with the adversary, service-value propositions with desired effects by political-military stakeholders, and services with operational (targeting) processes. This allows for the adoption of a foundational military network model combining the four modes of problem-solving and the three forms of interdependence, with an emphasis on services (see figure 2). This service-centric foundation details interdependencies of collaborative services and innovation.

Next, when we look at innovation, the interdependence of problem-solving modes is vital for capability development. We understand this interdependence as networked problem-solving (for instance, "Technology matters but so do concepts of operation," and "New ways of using technology can stun an adversary"[34]). Unfortunately, stakeholders associated with each mode of problem-solving tend to pursue their own issues and develop their own mindsets.[35]

Presently, military logistics tends to remain somewhat passive and reactive. For strategic logistics innovation, we argue that networked problem-solving—across the four modes—must be improved as a means of processing trend effects.[36] Networked problem-solving can be analyzed using two dimensions: coupling and temporal relatedness (see figure 3). We propose a dual shift: Logisticians should no longer wait for the other problem areas to conclude their processing of trends; they must tighten their interactions with counterparts.[37] Moreover, a proactive role for military logistics innovation calls for concurrent development.[38]

The present institutionalized environment does not seem ready for collaborative services and innovation. Interventions are required to break down the stovepipes of stakeholders in strategic

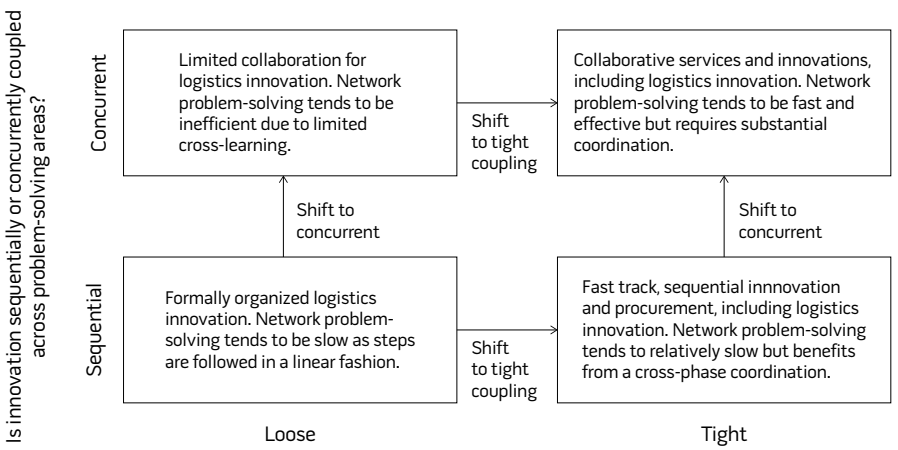
political-military, military operations, logistics, and technology areas.

Interventions to Foster Collaborative Services and Innovation

Intervention 1: Develop Sensitizing Concepts. This first intervention introduces and elaborates core ideas and concepts that can be shared across the scattered community of stakeholders associated with each problem area. We propose sensitizing concepts that encourage theoretical development. Decades ago, Herbert Blumer argued that "a sensitizing concept . . . gives the user a general sense of reference and guidance in approaching empirical instances. . . . Sensitizing concepts merely suggest directions along which to look."[39] This is already taking place via various formal and informal communications such as conferences, Web sites, listserves, publications, and interpersonal communications. Examples of sensitizing concepts permeating the network of problem-solving areas include "togetherness" concepts such as multidomain, interoperability, network, connected, and (spider)web, and concepts stressing self-reliance, self-repair, and resilience. These sensitizing concepts will be shaped within and across problem-solving areas in different ways; their meanings are likely diverse across stakeholder groups, yet a "translation" vocabulary might be developed as a means to coordinate these interpretations and generate new understandings. This process's deliberate management might undergird networked problem-solving, including activating military logistics innovation in a concurrent mode. Moreover, logistics concepts developed within a service unit such as special operations forces might become a learning platform for others in the military ecosystem.

Intervention 2: Blend Concepts. In 2003, the importance of concept blending was acknowledged in military literature describing *transformation* as "a process that shapes the changing nature of military competition and cooperation through new combinations of concepts, capabilities, people and organizations."[40]

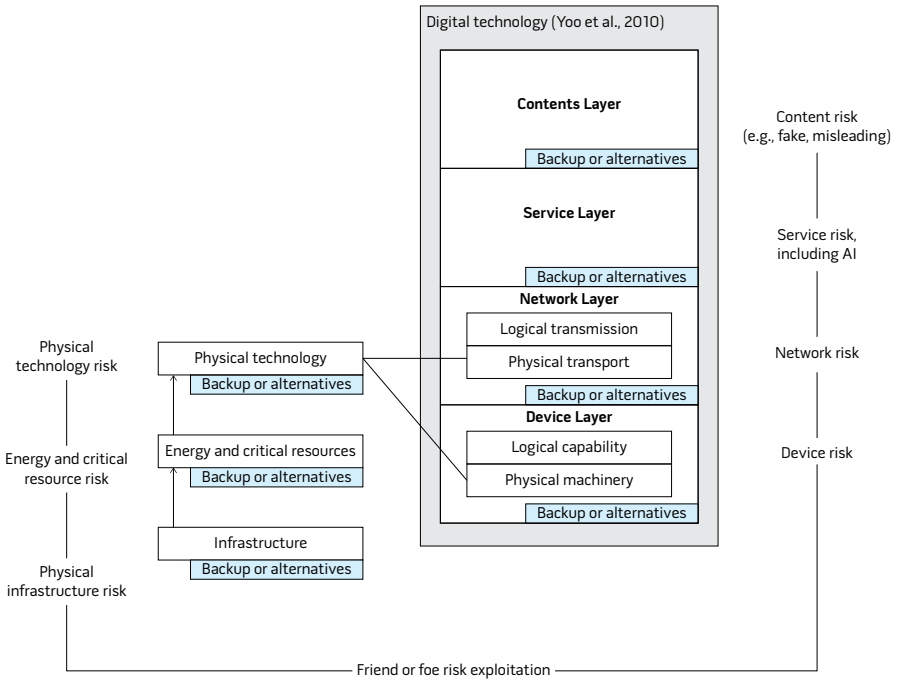
Figure 3. Positioning Networked Problem-Solving



Concept blending merges content elements from different input spaces.[41] It not only respects input spaces but also moves forward to new blended or hybrid concepts. Thus, content elements are transferred while the core structure of the concept within a particular problem-solving area is maintained. In order to exist in the operational domain, hybrid warfare necessitates a blend of elements from various domains. Conceptual blending primarily mixes requirements and insights from operations with logistics concepts from the military or its commercial partners. For instance, the operational domain calls for extremely flexible high-tech human-machine nodes in a network. This situation could be blended with elements from both existing combat logistics concepts and electronic commerce concepts, such as drone delivery and smart management of stocks.

Intervention 3: Compress Experiential Cycles and Run These in a Concurrent and Interdependent Manner. While traditional methods propose sequential steps, researchers have found that innovative companies compress their development of new products and services. Leading and accelerating this process are more important than the resulting designs or concepts. This faster pace does not simply consist of taking less time for sensing-seizing-reconfiguring.[42] Research shows that organizations also must rely on improvisation, real-time experience, and flexibility. This type of dynamic process must be carefully filtered and calibrated to disrupt institutionalized ways of doing things and to prepare for the future. Interaction across operations and logistics encourages mutual understanding and idea generation. Hence, collective (digital) spaces for operations-logistics experimentation are of paramount importance. These spaces can be conceived of as add-ons to already existing, specialized operations and logistics simulation and experimentation. Facing challenges presented by multi-domain battle, U.S. military Services are experimenting with integrated operations (for example, a recent exercise combining Army air and missile defense with Air Force F-35s).[43] While, at present, joint operations tend to be sustained in a separate manner, we suggest a concurrent exploration of logistics opportunities and risks at the network level that move beyond shared services. In other words, concept development could be executed in parallel instead of sequentially.[44] This type of development implies intensifying task interdependence and coordination requirements (from a sequential "I wait for you" to a concurrent interdependence "What you do matters to and inspires my work, and vice versa").[45] The fruits of these enhanced coordination efforts are acceleration, quality improvement, and exploration of the unknown. Researchers propose different information-processing

Figure 4. Risks Involving Multiple Problem Areas



strategies between concurrently linked processes depending on, for instance, the level of ambiguity. Military logistics concept development could vary across these strategies depending on the rhythm of operational concept development. Finally, suppliers are increasingly entering the equation, taking responsibility for key services to sustain weapons systems and provide logistics services right to the tip of the spear. If its weapons systems operate in a networked mode, the military must fine-tune suppliers' active involvement in operations and logistics, considering criteria such as effectiveness and security.

Intervention 4: Explore Cross-Area Opportunities and Risks. We already referred to opportunities and risks across problem-solving domains. In the digital era, technology has become more complicated in the sense of different layers. The dark gray rectangle in figure 4 shows these complex digital technology layers, from content (for example, fake news and misinformation problems) down to services, networks, and devices (for example, control software problems).[46] Examples of layered military technology include command and control systems, weapons systems, and business-logistics services. We highlight the physical dimension of this layered digital technology because of its importance to logistics. The physical dimension relies on energy, critical resources, and, ultimately, infrastructure (for example, glass fiber networks, satellites, and technologies for solar energy). Each technology component could be exploited by adversaries, and each requires backup or alternatives to ensure survivability. The interplay of risks and opportunities across the technology components is complex and unknown. Networked problem-solving is required in dealing with this exciting playground of friendly and enemy forces in offensive and defensive manners. For instance, fake news in the content layer could lead to incorrect situational awareness, with disastrous strategic-military and operational implications. On the physical side, new targets (for example, networks, devices, energy, critical resources, and infrastructure) have emerged that could be attacked in a kinetic or digital-cyber sense. Additionally, a digital attack on infrastructure control software may ultimately have a ripple effect on the content layer.[47] An unexpected attack on energy installations may completely disrupt economic and military activities.[48]

The problem-solving areas mentioned earlier need to develop capabilities to address the individual pieces of this complex puzzle and, thus, the issue as a whole. Involvement of suppliers is indispensable, since they have most of the technology components expertise. The industrial capabilities report offers strategic-sectoral risk assessment.[49] In addition, at a micro level, analysis of risks pertaining to technology components, as depicted in figure 4, is necessary. Comprehensive "digital twins" of weapons systems and software for understanding their associated supply chains will help in understanding which physical and digital technologies are in use and which supply chains are required for maintenance and updates. Conversely, the military must analyze the fabric of opponent technology for new opportunities in order to achieve operational and strategic objectives.

Conclusion

This article contributes to the ongoing challenge of strategically rethinking logistics for the military. We propose a collaborative services and innovation approach, along with a shift in thinking from known concepts toward concept development and strategic innovation. A strategic, proactive, and networked view of logistics innovation will ensure military logistics remains future-proof, is able to "adapt and integrate sustainment operations into the maneuver commander's plan," and continues functioning as a "combat multiplier."[50] We propose four interventions to foster strategic logistics innovation in close interaction with the operational realm.

Implementing this view on collaborative services and innovation requires awareness of different ways of relating to DOD and MOD external partners such as allies and weapons manufacturers. Partners feature their own strategic focus and values depending on their positioning in the public or commercial sector.[51] With its close ties to suppliers, the military could be considered a hybrid and culturally unique organization. It relies on a variety of interorganizational

relationships. Increasingly, the military organization could be viewed as an extended enterprise, comprising its core as a lead organization and partnering organizations on whom it depends.[52]

How might a shift toward collaborative services and innovation be embraced? Strategic logistics, or innovation, must become accepted in the joint strategic environment and planning process. This strategic legitimacy must then be translated into integrating—not homogenizing—a patchwork of operational and logistics AI innovations and infrastructures. As a precondition, such efforts involve the strategic management of military logistics organizational relationships along with their operational counterparts and other partner stakeholders.

First, internally within DOD or an MOD and its branches, the military logistics organization must develop new institutional frameworks, invest in continuous improvement, upgrade its workforce, and accelerate its own digital transformation.[53] The organization must also develop its abilities to securely share business processes and data while dealing effectively with multiple relationships and contracts using AI. Second, externally to DOD or an MOD, strategic and operational ties should convert into an adaptive learning network. With a core network of first-tier partners, the military logistics organization might proceed through ongoing strategic capability development cycles in leveraging digital innovation. To an extent, this core network is dynamic; depending on the problem areas' stakeholders, logisticians combine common tendering and arm's-length contracting, on the one hand, with grants or reciprocal collaboration with, for instance, research labs and universities, on the other. Second- and third-tier partners should engage with a long-term vision and link up with internal parties of the military logistics organization. As strategic logistics (innovation) legitimacy is ensured and collective AI innovations and infrastructures emerge, military logistics organizations should keep abreast of (digital) innovation of the core network to remain truly relevant. **JFQ**

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Show of force during Iranian Revolution, 1979

Embracing Asymmetry

Assessing Iranian National Security Strategy, 1983–1987

By Spencer Lawrence French

The Iran-Iraq War has affected Iranian leaders' decisionmaking calculus over more than three decades, shaping military strategy, force structure investments, and risk tolerance. The cumulative effects of the war are strikingly evident today in Iran's asymmetric strategy against the United States and the Gulf States. Iran's decisions in 2019 and 2020 especially—such as attacking international oil tankers, launching missiles at oil and military targets, and leveraging Shi'a proxies across the region—reflect Iran's experience during the Iran-Iraq War when the country faced better equipped adversaries while simultaneously struggling with economic troubles and international isolation. Iran's war strategy was born from the country's inability to achieve strategic ends through conventional means. Unable to escalate the conflict vertically in Iraq, Iran sought to escalate it horizontally against those supporting Iraq's war effort while deploying proxies, terror, and economic warfare capabilities in a piecemeal and reactive fashion. Thus, while these wartime efforts were often successful at the tactical level, they had limited operational effects and failed to achieve the desired strategic coercion.

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Current supreme leader Ali Khamenei, who was president of Iran during the war, and nearly all of Iran's current top military and national security leaders either helped implement or at the very least witnessed this strategy during the war.[1] From their limited perspective of the war, these leaders potentially concluded that the tactical effects of persistent low-intensity asymmetric warfare did have strategic impact and that better synchronization at the operational level or more resources could have led to victory. The success of Iran's asymmetric warfare in advancing its objectives in Iraq in the 2000s likely reinforced the wrong lessons about the coercive power of asymmetric warfare and colored the country's analysis of the Iran-Iraq War. Given the lasting impact the war has had on Iran's military actions, examining the country's experience during the conflict offers a unique window into Iranian decisionmaking today.

Background and the Origins of Iran's Asymmetric Approach to Conflict

In September 1980, the Sunni-dominated Arab nationalist state of Iraq invaded Iran under the pretext of liberating the ethnic-Arab population of Khuzestan Province and annexing the oil-rich province along the Persian Gulf. To Saddam Hussein, Ayatollah Khomenei "constituted an implacable ideological foe,"[2] and Iran, motivated by political Islam, represented an existential threat to Ba'athist Iraq. By 1980, Iran's post-revolution political isolation and officer purges had begun a spiral of declining armed forces combat effectiveness, which represented a window of opportunity that Saddam felt compelled to seize. The heavy losses sustained in the first months of the conflict exacerbated this decline, and Iran was simply unable to reconstitute, rearm, and retrain its first-rate Shah-era forces. Lacking military hardware and professional leadership, Iran was forced to blunt and reverse the Iraqi gains using massed irregular light infantry forces. While costly, this approach ultimately proved successful, and by the summer of 1982, Iran had pushed Iraqi forces back to pre-war boundaries.

However, instead of seeking terms, Khomenei expanded his war aims from restoring the territorial integrity of Iran to including the abdication of Saddam, as well as obtaining war reparations from Iraq. Despite the clear military risks, the possibility of exporting its Islamic revolution to Iraq was impossible to refuse. For the next 5 years, Iran mounted largely ineffective offensives while Iraq conducted an adequate defense of the approaches to Baghdad. Iran's ground forces ultimately proved unequal to the task of seriously threatening Baghdad, seizing the centers of Shi'a religious life in Iraq, or convincing Iraq's Gulf financiers to end their support. Iran simply lacked the ground forces capable of seizing territory, air forces capable of breaking Iraqi morale and wartime infrastructure, or naval forces capable of blockading Iraq and the Gulf States.

Fighting with Insufficient Weapons

By 1984, Iran had practically exhausted, and had no way to replace, its pre-war heavy weapons. While able to contain Iraqi counterattacks and launch limited offensives of its own, Iran was incapable of defeating Iraq on the battlefield. The Iranian Revolution terminated the country's relationship with the United States, its primary arms supplier, and caused the United States to curtail Iran's access to other foreign weapons suppliers. Iran's military industrial base in the late 1970s and 1980s was unable to fill the gap, being primarily focused on infantry weapons systems and ammunition.[3] The chaos of the Iranian Revolution further reduced the country's already limited arms production.[4] Thus, in the months preceding the war, Iran had no domestic or international source for arms, technical assistance, or training.

Iran became unable to replace platforms and trained crews once they were lost. The Central Intelligence Agency (CIA) estimated that, by mid-1984, the Iranian air force, once the preeminent air power in the region, had fewer than 80 fully operational fighter aircraft, compared with more than 400 under the Shah.[5] Estimates suggest that Iraq had an eight-to-one advantage over Iran in combat aircraft.[6] Further combat losses and the lack of replacement parts meant that, by mid-1986, Iran likely had no more than 50 operational fighter aircraft.[7] The situation was no better on the ground. By 1984, Iraq had a four-to-one advantage in armored vehicles,[8] and by 1986, this gap had increased to a six-to-one Iraqi advantage.[9]

Fighting on an Anemic and Hobbled Economy

Crushing arms embargoes, financial shortfalls, and an inability to expand its domestic production of sophisticated weapons systems meant that, while Iran was able to secure some supplies from China, North Korea, Syria, and Libya, as well as spare parts from Europe, its procurement was dwarfed multiple times over by Iraq.[10] Additionally, most of these purchases were for small arms ammunition, infantry antitank weapons, and spare parts, as opposed to combat vehicles, self-propelled artillery, or other sophisticated equipment necessary to truly challenge the Iraqi army on the approaches to Baghdad. Furthermore, Iran was unable to locate a reliable source of Western and, particularly, U.S. parts and end items, thus forcing it to replace U.S. equipment with Eastern Bloc equipment. This complication resulted in logistics, training, and doctrinal problems as Iran attempted to assimilate the new equipment while simultaneously at war.

Throughout the mid-1980s, oil prices were relatively low, but coordinated U.S. and Saudi actions further reduced prices to $15 per barrel in mid-1986, reducing Iranian state revenue by two-thirds.[11] During the mid-1980s, Iran thereby lacked the currency reserves to meet its procurement requirements on the foreign market and was unable to meet its needs domestically, largely due to "shortages in raw materials caused by import restrictions, low productivity, and faulty management practices," exacerbated by a "scarcity of expert personnel, insufficient

USS *Stark* listing to port after being struck by two Iraqi-launched Exocet missiles, Persian Gulf, May 17, 1987 (U.S. Navy)

receptivity to innovations, and excessive bureaucratic formalities" and an overall "weak technological industrial base."[12]

U.S.-sponsored financial and trade sanctions further reduced Iranian access to foreign capital. Over $6 billion in Iranian assets remained frozen even after the 1981 Algiers Accords. The United States also reimposed sweeping sanctions in 1984 in response to Iranian support for Lebanese Hizballah while blocking Iranian attempts to obtain World Bank loans.[13] Finally, facing domestic pressure over the Iran-Contra affair, and in response to Iranian attacks in the Gulf, the Ronald Reagan administration levied a ban on all Iranian imports to the United States in 1987.[14]

A Vicious Cycle and Stalemate

In short, Iran was caught in a vicious cycle of poor combat effectiveness. Losses in armor or aircraft could not be replaced because Iran possessed neither a reliable international supply nor a robust domestic production base. Even if Iran secured equipment, it was woefully lacking in trained operators and maintenance personnel. Iran was forced to substitute by drawing on its superior manpower reserves to field primarily mass infantry formations. Yet these formations suffered high attrition and continuously required replacements. Such high throughput meant training was limited, and in 1984, Basiji troops, making up 20 percent of frontline units, received only approximately 2 weeks of initial training before deploying.[15] This resulted in poor combat performance, higher attrition, a generally low level of experience in frontline units, and overall low combat effectiveness.

The Iranian offensive near Basra in February 1984 is illustrative of Iran's inability to mount a strategic offensive that could legitimately threaten Iraq. Iran suffered at least 40,000 casualties assaulting the marshes north of the city and failed to secure the approaches to Baghdad or isolate Basra.[16] This breakdown clearly demonstrates Iran's problem. The terrain east of the Iran-Iraq border is more complex than the terrain to its west. The terrain south and east of Basra is waterlogged and unfavorable to armored or mechanized formations, yet the approaches to Baghdad, particularly west of the city, are open, favorable for a mobile counterattack.[17] Along the northern portions of the Iran-Iraq border, the situation was similar, because "while the mountainous terrain on the border favored infantry operations, the more open terrain lying beyond provided Iraqi armor with an enormous advantage, of which it made full use."[18] Thus, by 1984, the combination of terrain and Iran's shortfalls in armor and artillery effectively ensured that the country would be able only to impose cost on Iraq through a bloody stalemate and local attacks on favorable terrain. Iran would not be capable of conducting the type of large-scale offensive necessary to achieve its expanded aims. As the gap between Iraqi and Iranian capabilities grew over the course of the conflict, it only further underscored this reality.

Yet it took Iranian leaders time to comprehend this situation, and Iran oscillated between executing a war of attrition and attempting to seize the initiative through costly and largely ineffectual offensives. The Karbala offensives of 1986 and early 1987 demonstrated that Iran could not sustain large-scale conventional

offensives in Iraq and that Iraqi defenses were more than a match for Iranian capabilities.[19] Recognizing the limitations of its conventional capabilities, and yet intent on fulfilling its expansive war aims, Iran developed an asymmetric strategy aimed at attacking Iraq's perceived weaknesses as opposed to its conventional strengths. Iran increasingly focused on expanding the war horizontally to target Iraq's enablers and fielded a suite of asymmetric tools that it would employ, with some effectiveness at the tactical level, for the duration of the war.

Targeting Iraq's Gulf Lifeline: Economic Warfare and Terrorism

Key to Iraq's ability to continue the conflict was the financial support of the Gulf States. Throughout the war, Iran suffered a lack of currency reserves due to low oil prices. Thus, Gulf oil production directly contributed to the Iraqi war effort and hurt Iranian finances. Iran's leaders concluded that to offset Iran's conventional weakness and shift the strategic balance, the country needed to expand the horizon of the conflict, coercing Saddam's supporters to abandon him. The difficulty lay in how to achieve this without inviting the outright intervention of the Gulf States or their Western allies. Iranian leaders operated under the hypothesis that a low-level campaign of terrorism and disruption of oil commerce could have this coercive effect. The campaign culminated in 1987–1988 but, despite certain tactical success, never achieved the intended strategic result.

Shi'a Proxies

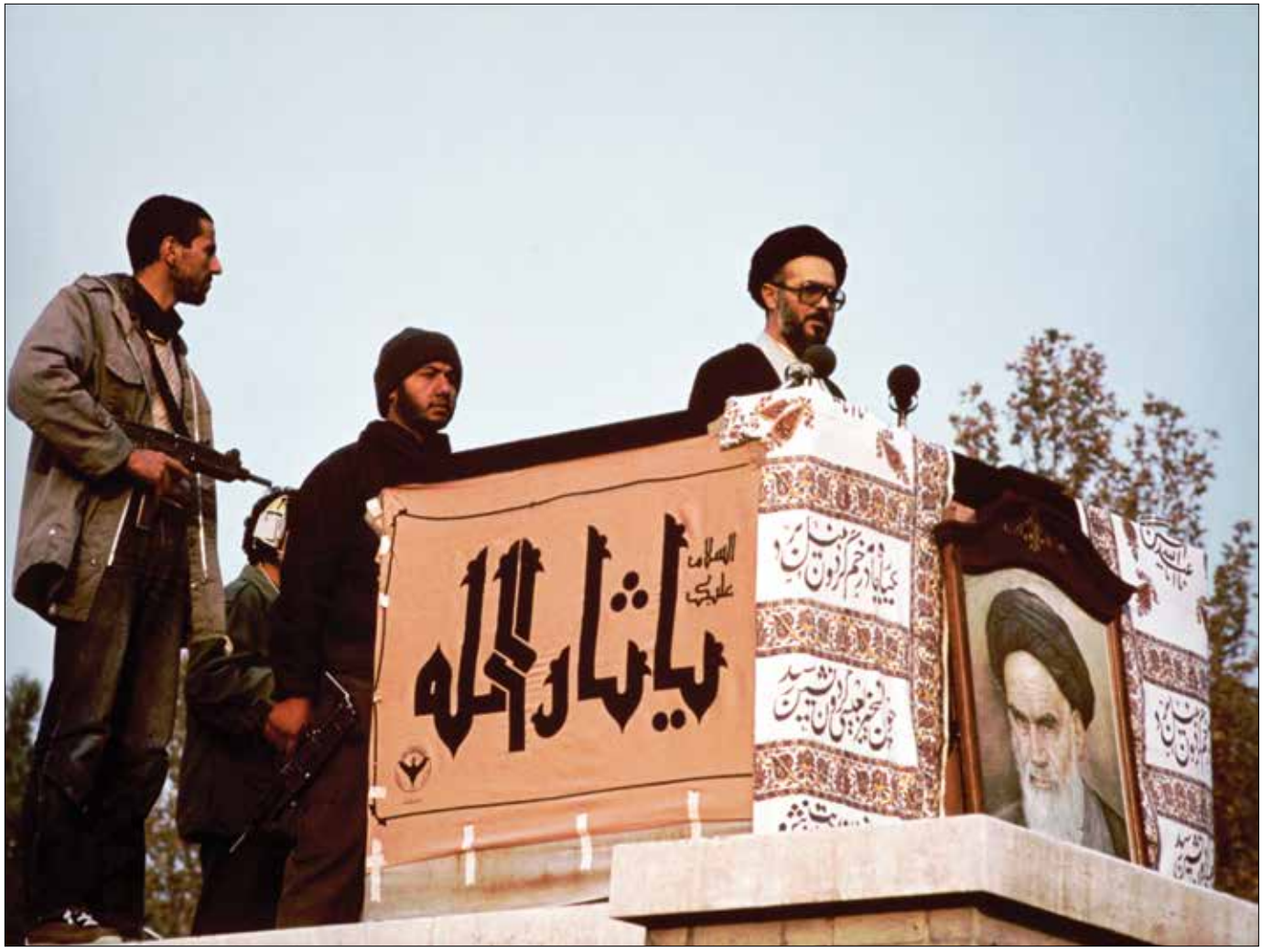
The presence of largely repressed Shi'a minorities in the Gulf provided Iran with raw materials for proxy groups. Iran's Shi'a revolutionaries themselves were part of a larger ecosystem of political Shi'ism that had begun to flourish in the 1960s, and thus had an ideological as well as a practical reason for supporting armed movements in the region during the war. As early as 1981, Iran sponsored a Shi'a insurrection in Bahrain,[20] and by 1984 American intelligence began seeing indications of Iranian training of terror groups in the Gulf, predicting that "because of its military weakness, Iran may now turn to terror as a means to weaken Baghdad's support in the Gulf."[21] In keeping with the strategy of reducing Gulf support for Iraq, while simultaneously driving up oil prices, Iranian-backed saboteurs bombed Kuwaiti oil facilities in June 1986. Four bombings followed in 1987, along with Kuwaiti-Shi'a protests.[22]

The year 1987 also witnessed the birth of Hizballah al-Hijaz, formed by the Iranian Islamic Revolutionary Guard Corps (IRGC) primarily from disaffected Shi'a based in the oil-rich Saudi Eastern province. Between August 1987 and March 1988, the group attacked a gas plant and bombed petrochemical installations at Ras Tanura and Jubail.[23] Despite the investment in these groups, at least during the Iran-Iraq War, they posed little danger to global oil markets or regime security. Iranian leaders likely saw their attacks as a way to demonstrate to the Gulf States the vulnerability of their installations and the level of Iranian control over portions of their populations, but there is no indication that Gulf leaders were coerced to lower support.[24] Part of the reason behind this fact is that, despite the tactical successes of these groups in organizing and executing complex attacks, the sporadic nature of the attacks unsynchronized with other coercive tools presented the Gulf States with a real dilemma.

Mining the Gulf

Similarly, in 1984, Iran faced a concerted Iraqi campaign against the Iranian oil industry. Given that Iraq could count on Gulf finances as a backstop, damage to the Iraqi oil industry had less impact than similar damage to Iran. Mines promised the ability to impose cost on Gulf oil producers in a relatively deniable fashion, thus avoiding the direct intervention of the superpowers while simultaneously expanding the scope of the conflict to target Iraq's financial backers. So, as early as 1984, Iran began expanding its mine-laying program. While Iran never possessed the capability to fully close the Strait of Hormuz, Iranian leadership hypothesized that the threat of mines would be enough to have a coercive effect, without forcing Iran to engage in a costly and difficult mine-laying campaign.[25] By January 1985, they assessed that Iran could "probably lay enough mines to raise insurance rates and deter shipping to Gulf ports."[26] Under this logic, producers would pass higher insurance rates on to consumers as higher oil prices, thus disrupting Gulf suppliers while making Iranian exports that escaped Iraqi targeting more profitable.

In 1987, at the height of the Tanker War, as the United States launched Operation *Earnest Will* and began reflagging Kuwaiti tankers, mine warfare became Iran's economic weapon of choice. Iranian mines did have a limited tactical effect. They damaged some tankers and forced the United States to deploy additional minesweeping assets to the region; however, they failed to have the desired strategic effect of substantially reducing Iraq's ability to finance the war. After the reflagged oil tanker MV *Bridgeton* hit a mine in July 1987, global oil prices held steady for 3 weeks before continuing the downward trend. In the month following the attack, crude oil prices fell 1.1 percent as compared to 1.6 percent in the month before the attack.[27] This trend suggests that Iranian mining operations might have spooked oil markets and forced the industry to factor their small cost into pricing and insurance rates. However, the change was so inconsequential as to have no lasting effect on the underlying market dynamics. Once the actual costs of Iranian mining operations were shown to be minimal compared with other business costs, markets adjusted. Similarly, while mining allowed Iran to avoid losing a conventional battle with the United States, Iranian use of economic terrorism invited further U.S. military, economic, and political engagement in the region. Thus, while Iran succeeded at the tactical level in employing mines against individual tankers as a means to offset U.S. conventional strengths, the country failed both at the operational level to



Muslim cleric, possibly Mohammad Mousavi Khoeiniha, speaking behind cloth-drapped stand displaying photograph of Ayatollah Khomeini, outside U.S. Embassy, Tehran, Iran, 1979 (Library of Congress/Sharok Hatami)

significantly influence the volume of Gulf shipping and at the strategic level to influence global oil markets and reduce Iraq's ability to finance its war effort.

Missiles as Economic Terror Weapons

In seeking to threaten Gulf oil supply in addition to transportation, Iran was confronted again by its limited aviation assets. Iran's Gulf neighbors possessed advanced air defense capabilities. While attack aircraft might have been the most cost-effective option for degrading oil infrastructure, such a conventional strategy was not an option for Iran given its limited aircraft and pilots and its inability to procure substantial amounts of new equipment and training. At the same time, Iran's ballistic missile capability was not up to the task of credibly threatening the destruction of Gulf oil infrastructure. Despite attempts to stand up a domestic ballistic missile manufacturing program, Iran had no ability to domestically produce medium-range ballistic missiles during the conflict, and had limited success in producing short-range ballistic missiles (only starting in 1988).[28] From 1985 to 1987, Iran was almost entirely dependent on Libya for clandestine transfers of a small quantity (at least 50) of Soviet-manufactured Scud-Bs as well as Libyan ballistic missile expertise.[29] From mid to late 1987, Iran procured about 100 North Korean–manufactured Scud-B missiles.[30] Consequently, Iran's inventory remained limited from 1985 through the end of the conflict, almost certainly never exceeding 100 missiles on hand at any point, and probably averaging substantially fewer than that estimate.

Iran's Scuds had an accuracy of only within 1 kilometer at two-thirds of its maximum range,[31] and while oil facilities are large targets, precision is necessary to deliver truly lasting damage. Iran was thus forced to launch 10 to 20 missiles or more to have a chance of crippling the target.[32] Consequently, Iran never possessed a large enough inventory of ballistic or cruise missiles to meet the task of credibly threatening the destruction of a meaningful percentage of Gulf oil infrastructure.

In keeping with the theory that economic terrorism creates market uncertainty, Iran's leadership hypothesized that firing one or a small number of missiles

at an oil facility might raise prices, even if doing so was likely to cause only minimal damage.[33]As Saudi Arabia began lowering global oil prices through increased production in 1986, Iran brandished its missiles, hoping to spook markets. In October 1987, Iran launched short-range Silkworm antiship missiles at Kuwait's Sea Island petroleum export terminal, seeking to deter Kuwait from cooperating with the United States and Iraq.[34] The markets were largely unaffected, and the threats went unheeded. In April 1988, Iran accused Kuwait and the United States of directly assisting Iraq in launching an offensive on al-Faw.[35] In response, Iran fired a single Scud into the U.S.-operated Wafra oil field in the neutral zone.[36] Iran clearly intended to send the message that continued support for Iraq would have economic consequences for the United States, Kuwait, and Saudi Arabia; however, this idea was not credible given Iran's ballistic missile force capabilities. Furthermore, global oil markets were not shocked by this approach, and at best the attack only held prices steady for 2 months before they resumed their downward trend.[37] Thus, the military effect of Iran's missile attacks on Gulf oil facilities during the war was negligible, and the psychological effect on global oil markets was transient at best. Iranian leaders may have seen the utility of ballistic missiles as an instrument of coercion, psychological warfare, and economic terrorism, but the capabilities and inventory of the Iranian ballistic missile program proved insufficient to credibly coerce.

All told, Iran's coercive acts in the Gulf failed to significantly alter the strategic landscape. As the price of oil fell, Iranian state revenues plummeted, Gulf powers continued to support Iraq, and ultimately the United States stepped in to guarantee freedom of navigation. Iran sought to "apply steady pressure on their rivals without using any one instrument with such force that it invites retaliation."[38] The Gulf States might have understood Iran's intended message that lower support for Iraq would result in lower costs to Gulf oil industries, but the relatively uncoordinated and ineffective campaign never forced them or the United States to do more than rely on Iraq to hold Iran in check, while moderately increasing maritime security. Iran was more successful at the tactical level, leveraging a multiplicity of proxies and weapons systems to strike targets of their choosing. Iranian leaders might imagine that such tactical successes translated into a strategic coercive effect in the Gulf; however, there is little evidence to support this conclusion.

Targeting Iraq's Internal Fault Lines: Proxies and Terror Weapons

Iran attempted to leverage asymmetric capabilities to gain direct advantage over its Iraqi adversary, degrade Iraq's ability to marshal its resources against Iran, and deter Iraq from applying its superior conventional means against Iran. Iranian leadership identified Iraq's ethnic and religious fault lines as opportunities that could be exploited to force the Iraqi government to shift forces from the front to perform internal security roles. Iran also viewed the Iraqi public's growing dissatisfaction with the war as a vector for degrading regime security. Finally, Iraq's oil economy, like that of the Gulf, appeared ripe for disruption. By 1987, Iran was regularly striking Iraq with missile and proxy terror attacks, but the country's assumptions about the weakness of the Iraqi polity and the effect of small-scale strikes proved unfounded.

Kurdish Partners and Shi'a Proxies

While more partner than full proxy, the Kurds were Iran's most capable ally in Iraq. From the beginning of the war, Iran provided direct assistance to the Kurdistan Democratic Party (KDP) forces in their conflict with Baghdad but had strained relations with the Patriotic Union of Kurdistan (PUK).[39] By 1984, Iran began more serious attempts to utilize special operations forces and Kurdish irregulars to divide Iraqi combat power, occasionally creating windows of opportunity to seize the approaches to Baghdad. For instance, on May 15, 1986, while Iranian forces were engaged in offensives near Basra, Iranian paratroopers infiltrated behind Iraqi lines and, with support from the Kurdish Peshmerga, seized positions near Mosul, threatening the Kirkuk-Dortyol pipeline.[40] Confronted with mounting battlefield losses, Iran went to great lengths to broker a comprehensive agreement between the PUK and KDP to form the Iraqi Kurdistan Front (IKF) in the spring of 1987. This unified Iranian-backed Kurdish bloc forced Iraq to deploy up to one-third of its combat power to defeat the Kurdish insurrection.[41] Yet, once again, Iran was unable to capitalize on this temporary advantage to seize momentum, and the IKF soon collapsed under Iraqi pressure and internal infighting.

Iran built new proxies aligned ideologically with Tehran and over which it had direct control. Following the Iranian revolution, Saddam cracked down on Shi'a political groups, and many dissidents, especially those of the Islamic Dawa Party, fled to Iran. In anticipation of the possibility of the overthrow of Saddam, in 1982, Iran used some of these dissidents to form the Supreme Council for the Islamic Revolution in Iraq (SCIRI).[42] As Iranian forces proved unable to break the stalemate of 1983, Iran established the Badr Corps under the IRGC as SCIRI's military wing[43] and began recruiting and impressing Iraqi Shi'a prisoners of war, dissidents, and refugees into service as guerrillas.[44] These Shi'a militants, while irrelevant when deployed alongside conventional forces, could conduct bombings and assassinations deep in Iraq. Yet Badr terrorism failed to paralyze Iraqi leadership or seriously strain Iraqi security services. Most important, SCIRI and Badr failed in their primary mission to ignite a Shi'a revolution in Iraq. Other Iraqi Shi'a leaders more amenable to working with Saddam, such as Muhammad Sadiq Sadr, had stepped in during the war to fill the Shi'a "leadership vacuum" left by the flight of Dawa's cadre.[45] So, while over 70 percent of Iraq's enlisted men but only 20 percent of its officers were Shi'a,[46] no amount of Iranian organizing engineered enough defection or sabotage in the

USS *John Young* shells two Iranian command and control platforms in response to recent Iranian missile attack on reflagged Kuwaiti super tanker, October 19, 1987 (U.S. Navy/National Archives and Records Administration)

ranks to substantially decrease Iraqi combat effectiveness. Thus, while Iran's more recent success deploying Shi'a militants makes the investment during the 1980s seem prescient, the actual impact during the Iran-Iraq War was negligible.

Missiles as Terror Weapons

In 1984, Saddam increased airstrikes on Iranian cities in an attempt to break morale and force Iran into negotiations. The high casualties of the previous year's offensives as well as the declining living standards in Iran made the Iraqi bombing campaigns a pressing threat.[47] Lacking attack aircraft and possessing inadequate air defenses, Iran had few options to respond. Given its limited stockpile of ballistic missiles and procurement challenges, Iran sought to use its missiles coercively to force the Ba'athists to confront their own morale issues, thereby restoring deterrence.

Between March and June 1985, Iran launched a dozen Scuds at Baghdad. To reduce the psychological impact of the strikes, the Iraqi government initially tried to claim the strikes were terrorism or sabotage.[48] Yet this public deception was actually counterproductive, and once the Iraqi government began acknowledging the strikes and civilians became accustomed to their limited lethality, the temporary dip in morale self-corrected.[49] Even when these strikes on population centers were synchronized with large-scale conventional offensives, they failed to produce the intended synergistic operational result.[50] Iran's strategy of low-intensity employment of these terror weapons spread over a long period made their psychological impact less dramatic than if they had been more concentrated in time and space.

Furthermore, there is little evidence to suggest that Iranian Scud strikes had substantial military effect, as almost all the supposed targets, such as Ba'ath headquarters and military training academies, survived.[51] The strikes' economic effect was, likewise, negligible. While Iranian attempts to degrade Iraqi oil production had begun at the outset of the war, between 1986 and 1988 Iran fired at least five Scud missiles at refineries in Kirkuk and other mid-range ballistic missiles at facilities near Banmil.[52] Damage was minimal, and, as with strikes in the Gulf, the missile attacks had no more than a fleeting effect on global markets.

Iranian ballistic missile strikes did perhaps succeed in increasing Iranian morale. It is likely not lost on Iranian leaders today that missile launches, paired with Iranian state propaganda, enabled the government to communicate to the population that it was capable of retaliating.[53] If messaged correctly, strikes were a source of national pride, increasing

support for the conflict and shifting blame for hardships from the state to the enemy.

In total, Iranian ballistic missile strikes numbered only a few hundred, delivering relatively little total explosive tonnage and doing only marginal damage to the Iraqi economy, security apparatus, or armed forces. The strikes failed to do lasting damage to Iraqi will or regime security and were hardly more effective operationally, doing little to degrade the combat performance of Iraqi army units in their defense of the approaches to Baghdad. Iranian leaders did, however, witness the propaganda value of ballistic missile strikes and explored their potential to provide deterrence.

In short, Iranian leaders saw Kurdish and Shi'a irregulars, as well as ballistic missiles, as a means to offset Iraq's conventional advantages. Yet while Kurdish guerrillas and Badr terrorists fixed some Iraqi resources in internal security roles, they did not come close to forcing Iraq to undermine its defense of the approaches to Baghdad. Likewise, Iranian Scuds failed to degrade Iraqi morale or infrastructure. While Iran's employment of proxies and terror in Iraq may have demonstrated the potential for using Scuds coercively within a conventional armed conflict, the intended strategic effect never materialized, largely due to Iran's inability to synchronize these effects in any meaningful way. At no point did these efforts mass effects synergistically to produce enough pressure on the Iraqi regime to force difficult decisions.

Conclusion

In 1988, Iran conceded that its maximalist war aims were out of reach, and Khomenei drank the "cup of poison." While somewhat successful tactically, Iran's asymmetric strategy neither broke the deadlock on the battlefield nor bankrupted Iraq. Yet Iran's leaders today, the same individuals who executed the strategy in the 1980s and oversaw the successful use of proxies during the 2000s and 2010s, likely drew different conclusions from the conflict. They may have either conflated tactical success with real strategic impact or attributed the failure of Iran to what they saw as overwhelming odds stacked against them. For these leaders, the real lesson of the Iran-Iraq War is that, given a fully realized resistance economy capable of withstanding international pressure and a well-developed regional network of proxies, Iran could generate strategic advantage through the skillful synchronization of asymmetric means.

Although this view may appear as a misreading of the conflict, Iran's leaders have both ideological and practical reasons to persist in their belief in the efficacy of an asymmetric offset strategy. The concept that religious faith brings about political change through revolutionary struggle is central to the identity of the Islamic Republic. While clearly pragmatic, Iran's leaders are products of, and in some cases creators of, a system that identifies this concept as an article of faith. In 1979, they witnessed firsthand the power that religious ideals hold to motivate small groups to overcome seemingly impossible odds. Consequently, despite the mixed record of its proxies, particularly during the Iran-Iraq War, Iranian leaders naturally continue to view religiously motivated proxies as a potentially decisive tool. Finally, while Iran has succeeded in developing its own domestic arms production industry and "resistance economy," it remains isolated and financially hobbled. Yet much like during the post-1982 years of the Iran-Iraq War, Iran's regional aims are misaligned with its actual limited conventional military capabilities. Thus, to a certain extent, Iran has no choice but to continue to turn to asymmetric means such as threatening Gulf economic and maritime targets to offset conventional disadvantage. Abandoning this strategy would force Iran to confront this mismatch and dramatically scale back its regional aims of regional leadership and of withdrawal of the United States from Iraq and the Gulf.

While asymmetric means failed to generate strategic advantage for Iran during the Iran-Iraq War, such an approach may be somewhat more suited to the environment today. The IRGC has spent the past four decades transforming the disaffected Shi'a minorities of the region into coercive levers. Iran, while continuing to enjoy the advantage of being geographically positioned to threaten the world's most important petroleum production centers and shipping lanes, now possesses "the largest and most diverse missile arsenal in the Middle East,"[54] with systems many times more accurate than those deployed during the war. Economically, Iran also has learned how to mitigate the damage of sanctions over the past 40 years and has adapted its economy to build resiliency.[55] On the diplomatic front, while Iran remains largely isolated, Iraq is no longer a foe, and unlike the 1980s, the superpowers are not aligned against Iran. As long as Iran avoids conventional escalation with the United States, it need not be concerned with battlefield defeat and regime removal as it had to during the war. Thus, situated in a more favorable geopolitical landscape, Iran now has greater coercive capabilities and ability to resist foreign pressure. Yet in an echo of the 1980s, the question remains whether Iran's expansive aims exceed its total coercive capabilities. Success will hinge, as it did in the Iran-Iraq War, on Iran's ability to synchronize its asymmetric means to generate sufficient coercive power to dramatically alter its adversaries' strategic calculus. **JFQ**

Notes

[1] Today, virtually all general and flag officers within the armed forces of the Islamic Republic of Iran and numerous senior civilians within the Iranian defense and security community served in some capacity during the Iran-Iraq War. For example, the current secretary of the Supreme Council for National Security, Rear Admiral Ali Shamkhani (Ret.), served in the Islamic Revolutionary Guard Corps (IRGC) navy during the war. Current chief of staff of the Iranian armed forces general staff, Major General Mohammad Bagheri, served in various combat and intelligence positions within the IRGC during the conflict. The current IRGC commander, Major General Hossein Salami, and the current IRGC Quds Force commander, Brigadier General Esmail Ghani, were both ground forces commanders during the war. The now-deceased, long-serving former IRGC Quds Force commander, Major General Qassem Soleimani, famously was gravely wounded numerous times during the conflict.

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Men of Nottinghamshire and Derbyshire Regiment (The Sherwood Foresters) marching along Amiens-St. Quentin Road, from Foucancourt, near Brie, Somme, March 1917, after German withdrawal to Hindenburg Line (Courtesy Imperial War Museum/Ernest Brooks)

Accelerating Adaptation on the Western Front and Today

By Justin Lynch

In wars, militaries rarely start out perfectly suited for the challenges they will encounter. Their organization, tactics, and weapons are not optimally matched to their environment or their enemies. The ability to adapt more quickly than an adversary gives a force a significant advantage.[1] The growing role software plays in military technology could augment the speed of adaptation, but to capture such advantages, the joint force must invest in its digital workforce and infrastructure.

Adaptation in Warfare

Williamson Murray's *Military Adaptation in War* opens by stating that "adaptation in war represents one of the most persistent, yet rarely examined problems that military institutions confront" and

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that "one of the foremost attributes of military effectiveness must lie in the ability of armies, navies, or air forces to recognize and adapt to the actual conditions of combat."[2] A short study of warfare on the Western Front during World War I showcases adaptation's importance. After the emergence of trench warfare, both sides quickly began adjusting their technology, tactics, and organizations in an attempt to achieve an operational breakthrough. The result was a race between combatants to adapt faster than their adversaries.

World War I

In summer 1914, young men across Europe marched to war. They left for what most of them believed would be a short conflict, one decided by the power of the offensive. After 4 months, they had settled into trench warfare that bore little resemblance to the war they had prepared for. Four long years later, the war on the Western Front bore even less resemblance to the vision held before August 1914.

Before combat began, military leaders understood that war was changing. A great deal of new military technology—such as scientific artillery, the machine gun, motor vehicles, and barbed wire—had developed in the years before 1914. Military leaders had already seen some of these tools in action, but few realized the nature or the magnitude of the impact that increased firepower would have on warfare between peer adversaries.[3] Moreover, because the combatants did not understand the effects new weapons would have, military tactics had barely changed since the 19th century.[4]

War of Maneuver. After hostilities began, the Germans and the French sought to destroy each other's armies via maneuver at the operational level.[5] Neither side had prepared for the newly increased firepower, and so they had disorganized maneuver and indecisive results rather than the power of the offense. As a result, the war quickly began to transition away from operational maneuver. At the end of August 1914, casualties were high, but the war was still one of maneuver. By September, the Germans were establishing trenches with interlocking fields of machine-gun fire on the Aisne. By October, disorganized maneuver had begun changing into a form of mutual siege warfare. By November, trench warfare prevented either side from achieving a decisive victory using any previous tactics, and thus forced a strategic stalemate.[6]

Trench Warfare and the Race to Adapt. Historians and artists often depict trench warfare as a static struggle characterized by incompetent leaders who ordered hopeless attack after hopeless attack in pursuit of the white whale of operational breakthrough.[7] Although not entirely untrue, that narrative captures only a sliver of reality. The challenges of trench warfare prevented both sides from breaking through and defeating the enemy. Both sides looked to a combination of technological and operational adaptation to solve this problem. Rather than just a static war, the Western Front was a competition to see which side could adapt its organizations and tactics, create new weapons for trench warfare, and react to adversary adaptations quickly enough to seize an advantage.[8]

The advent of commercial dual-use technology played a particularly prominent role. Much like today, technology development in the early 20th century took place largely in the private sector. Private-sector companies created aircraft, motorized vehicles, and other dual-use technology that became significant during World War I. Military leaders were aware that emerging civilian technology with potential military applications in communications, aircraft, and mechanized vehicles was mature enough to quickly prototype; when the war began, they began adapting technology to try to overcome the new challenges found on the Western Front.

For the infantry, trenches and other fortifications drove a shift from maneuver to mass. Continuous layered trench lines eliminated exposed flanks and forced units to rely more on frontal assaults driven by mass. To build mass, both sides began expanding their logistics infrastructure. Stable fronts allowed participants to build roads up to their trench systems and to increasingly use motorized transports to move troops, supplies, and equipment. The French used 600 Renault taxis to move 3,000 soldiers to the First Battle of the Marne in the world's first motorized military convoy in 1914.[9] By 1916, the French had transported 180,000 metric tons and 300,000 men by vehicle.[10] The improvement in logistics infrastructure, however, largely stopped behind the front. Units assaulting across no-man's-land still did not have the logistic tail needed to sustain their attack and break the stalemate.[11]

Mechanization offered a potential solution. Mechanized forces grew out of the belief that armies could use tractor technology to cross muddy terrain and survive enemy fires. Great Britain's War Office largely ignored tractor technology's potential in 1914. But that eventually changed, and the British used tanks in combat for the first time on September 15, 1916, at Flers.[12] The attack failed to create the hoped-for breakthrough, but it did teach the British important lessons about tank construction and employment. (The French faced a similar course.) By 1917, however, tanks were a major component of British offenses. Tanks, properly armed and armored, could escort infantry formations into trench systems and reduce sustainment issues by carrying water and ammunition.

The role of aircraft also changed. Before the war, military theorists believed aircraft would serve primarily as reconnaissance and artillery spotters. But once the war started, new roles emerged. Air warfare quickly grew into a fight for air superiority. Initially, air combat was fought between individuals. By late 1917, mass formations had reduced the role of individual aerial duels, and the ability of each state's industrial base to produce aircraft was as important as the courage of individual pilots.[13] Air warfare also expanded to include close air support and eventually into the bombing of cities such as Liège, Paris, and London.[14]

Militaries improved their growing air forces in two ways. They competed to develop a combination of doctrine and training that would allow them to achieve

Gun crew from Regimental Headquarters Company, 23rd Infantry, firing 37-millimeter gun during advance against German entrenched positions during Meuse-Argonne offensive, September 26–November 11, 1918 (U.S. Army/National Archives and Records Administration)

air superiority and deliver effects. Aircraft technology also changed quickly: The final report of the Chief of the Air Service at the end of the war claimed that "the improvement in pursuit airplanes was so rapid that few types retained their superiority for more than six months."[15]

The New Armies. By late 1917, the contest to adapt to trench warfare had caused both the Germans and the Triple Entente to develop new types of armies: the German coordination-of-arms model and the Entente tank-army model. The former, a combined arms force, relied on an unprecedented coordination of aircraft, artillery, and shock troops to create and exploit breakthroughs. It included improved small arms, aircraft, and artillery but relied noticeably less on technological solutions than the tank-army model. The tank-army model relied predominantly on the tank to help infantries cross no-man's-land. At the Battle of Cambrai in November and December of 1917, the British sent 450 tanks followed by 6 infantry divisions across a dry, flat section of the Western Front—and was able to advance 7 kilometers. Though the attack failed, by 1918, tanks backed by massed infantry and supported by artillery and aircraft contributed heavily to allied breakthroughs. German leaders coined the term *Panzerschreck* (tank fright) to describe the mass fear that tank formations inspired.[16]

The new armies constituted a major innovation. They created new tactical and operational concepts, trained their soldiers to fight in a new way, and integrated civilian technology—all of which resulted in forces that were more tightly coordinated than previous military forces and that applied firepower more effectively. The biggest changes to warfare, however, came from the role of tanks and aircraft. Mechanization gave maneuver forces new mobility, survivability, and firepower. Airpower expanded war from the land and sea to the air. Tanks and aircraft fundamentally changed the context within which wars were fought and showed the power of integrating emerging technology and tactics. By comparison, the coordination-of-arms model's failure to accomplish its strategic objectives showed the cost of an inadequate response to new operational challenges.

The Scale of Change. The states and armies that fought World War I underwent massive changes. The introduction of dual-use technology allowed both sides to quickly introduce new weapons. The generals who led these armies found themselves unprepared for the type of warfare they would fight; however, contrary to widespread belief, this lack of preparation was due more to their quickly changing circumstances than to incompetence. Instead of fighting the war they had prepared for, generals found themselves struggling to understand how combat had changed from operational maneuver to trench warfare—and then how to alter it yet again to achieve decisive victories.[17]

As a result, the armies that marched off to battle in the summer of 1914 would barely have recognized the type of warfare they would fight by the summer of 1917. The Hindenburg Line's fate illustrates the rate of change on the Western Front. When it was built in 1916, circumstances had changed, and it was one of the strongest, most advanced defensive positions in Western Europe; by the time allied forces reached it in 1918, it was obsolete.[18]

The Present

Militaries will undoubtedly face new and sometimes unexpected operational challenges—and to overcome them, they will need to adapt their doctrine, organizational structure, training, and technology. Although no one can predict the future, practitioners should use history to drive their inquiry and to understand how to question their assumptions.[19]

What Is the Likely Role of Dual-Use Technology Today? There is every reason to believe that adaptation will continue to play a role in conflict. It is also likely that, much like during World War I, dual-use technology will be adapted for combat. Since the end of the Cold War, the U.S. research and development base has shifted from the government to the private sector. Commercial firms develop most new technologies, including those with possible military application.[20] The private sector, including businesses that do not usually work with the military, leads the development of autonomous systems, machine learning, software,

heavy equipment manufacturing and repair, biotechnology, and other potential dual-use technologies at a faster rate than does the Department of Defense (DOD).[21] If DOD and its foreign counterparts attempt to adapt dual-use technology themselves—or turn to the private sector and ask it to do so for the sake of nationalism and profit—it is highly probable they will be able to quickly weaponize existing technology that is not already in military use. The result is a situation in which states that can more quickly adopt dual-use technology and integrate it into their tactics and strategy will have the advantage.

How Will Changes in Technology Affect Adaptation? Although the summer of 1914 and the present day have some things in common, there are key differences. The most significant is the increasingly important role software plays in society and warfare. Digital systems have become integral to most economies, infrastructure, and social systems. Many militaries, particularly the U.S. military, have become more and more digitized—and therefore reliant on their software's performance. Eric Schmidt, former chief executive officer of Alphabet and chair of both the Defense Innovation Board and the National Security Commission on Artificial Intelligence, refers to the current day as the age of software supremacy.[22] Software can change the capabilities of hardware without changing its physical features. Examples include network updates that reduce vulnerabilities and improve intrusion and anomaly detection, improvements to algorithms that control tracking systems, and changes to data management systems that allow warfighters to communicate faster and more efficiently. Other examples will soon include improvements to autonomous systems that will perform a significant role in actual combat.[23]

Software's role in conflict has already been demonstrated, particularly during attacks on digital systems. Some network breaches—such as Stuxnet and the various and frequent hacks by state actors of one another's public and private systems—have made headlines.[24] In 2017, the U.S. military tested its ability to stop armored vehicles using computer network attacks, but it has not publicly explored that capability's limitations or potential in combat.[25]

One implication of software's increasing significance is that tactical adaptation will begin to include—and, in some circumstances, require—software changes. If future conflicts see a software-driven race to adapt similar to the race on the Western Front, then adversaries will change their platforms to perform better in the environment and against their foes. Weapons guidance systems will need to better track adversaries using new camouflage, control systems will need to respond faster, electronic warfare platforms will need to better infiltrate enemy systems, and possible autonomous weapons systems will need to better locate and attack their targets.

Software's Acceleration of Adaptation

One of the biggest discontinuities between today's software and the types of technology adapted during World War I is that engineers can develop new software more quickly than they can new hardware. Software development relies on programming instead of manufacturing processes, allowing updates to bypass some of the physical constraints that slow down hardware development. Engineers can create new programs as quickly as they can type code and verify its functionality.

Once completed, software changes can also be implemented faster than hardware updates. New programs and updates can spread across the joint force as quickly and as broadly as an email, then install in seconds or minutes. It takes far less time to download a software update on a desktop computer than it does to fly or ship heavy equipment from the United States to an overseas theater.

Overall, software's increasing importance for military operations, pace of development, and speed of delivery will accelerate the rate of technology adaptation in warfare. Imagine weapon adaptation taking place at the rate Silicon Valley can produce new software updates—instead of the rate at which factories could produce and deliver new hardware in 1918. In 1918, a ship departing the East Coast for a combat zone arrived in the same state, with the same capabilities, as when it departed. Today, a ship leaving the East Coast that receives software updates to its communication systems, targeting software, and the programs controlling its automatic and autonomous systems can have different capabilities when it arrives in theater; this will only be truer tomorrow.

Recommendations

The joint force should establish rapid development and acquisition capabilities that can help commands quickly react to a changing threat environment, spot opportunities, and create the hardware and software that warfighters need to defeat their adversaries. Although this focuses on the production and use of digital technology, the biggest changes to the joint force will need to be in its investments in human capital and organizational structure.

Public-Private Partnerships. The most commonly discussed solution to military innovation challenges is to establish stronger public-private partnerships. DOD already has several programs in place to improve its relationship with private-sector developers or to solve specific problems.[26] Although these programs address important issues, improving public-private partnerships alone will not solve the challenges described herein. The current DOD relationship with the private sector has several challenges. These include a labyrinthine contracting process, cultural differences between the military and startup communities, and the DOD focus on long procurement cycles.[27] It is also difficult to predict how organizations that justifiably view themselves as global companies will respond to war.[28]

Personnel. Instead of relying primarily on the private sector, DOD should grow its own software development capabilities. Stephen Peter Rosen argues that "peacetime innovation has been possible when senior military officers, reacting not to intelligence about the enemy but to a structural change in the security

U.S. Soldiers of 30th Infantry Division with German prisoners following capture of Bellicourt, France, after Battle of St. Quentin Canal, September 29, 1918 (Courtesy Imperial War Museum/David McLellan)

environment, have acted to create a new promotion pathway for junior officers practicing a new way of war."[29] To create the ability to adapt software to rapidly changing circumstances, DOD must have highly skilled military and civilian personnel who provide three things:

- a centralized group of experts that can create high-quality software and algorithms and control their quality
- personnel distributed to tactical units who can recognize new challenges and opportunities and create early versions of new software
- the ability to quickly build and update networks for new capabilities.

These proficiencies are different from those of U.S. Cyber Command, whose focus is on "defending the DODIN [DOD information networks], providing support to combatant commanders for execution of their missions around the world, and strengthening our nation's ability to withstand and respond to cyber attack."[30] Though critical, that mission focuses more on the defense, exploitation, and attack of networks than on the creation of new software.

To meet these needs, each branch of the military requires its own software developers. Rapidly identifying opportunities and creating software to exploit them will be a form of maneuver just as critical as performing fleet movements, flying aircraft, or plotting ground forces. Because the Services would be extremely reluctant to rely on outside sources to perform these roles, they should treat software development with the same degree of concern. Parts of the military—such as U.S. Special Operations Command, the Air Force's Kessel Run, and the Army's Software Factory—have made a start, but the military needs more software developers in more units.[31]

Code and Data Access. Once in place, software developers require architecture and authorizations that allow them to locally manage, build, review, test, and release code. The Defense Innovation Board Software Acquisition and Practices study recommends managing source code in a single repository but encourages engineers to fix problems "independent of program boundaries."[32] For engineers to manage, build, debug, and release new software, they need access to their systems' codes, the authorization to change them, and the ability to disseminate changes.

Access to data will also be crucial. Data helps software developers understand system requirements. Machine learning in particular requires access to large data sets. Training and retraining algorithms to address new challenges will often require access to data sets from units encountering the challenge. To meet this requirement, tactical units need the bandwidth, computing power, software tools, and training to share and process large data sets. To be clear, this architecture, authorization, and access to data are not intended to create new technology; they are necessary to allow DOD to use existing technology effectively.

Organizational Structure. As it acknowledges the need to quickly create software for tactical environments, the joint force must determine where in its organizational structure it should place its developers and their tools. The degree to which software development and adaptation is centralized should be a function of both the consequences of errors and the consequences of adapting slowly. Systems with little margin for error that do not need to change quickly, such as aircraft carrier preventive maintenance, should be tightly controlled at a centralized facility where maintenance and development experts can methodically control quality. Other capabilities have a wider margin for error and require more rapid, localized adaptation. Units in ground combat have fewer systems that can produce catastrophic failures, and these units often experience stark differences in their operating environment; they may have to operate with limited bandwidth to their higher headquarters. In these circumstances, decentralized adaptation—and, in some cases, even decentralized development—may be more appropriate.

Some traditional private-sector companies that have integrated artificial intelligence and other modern software development processes have benefited from implementing a hub-and-spoke model. Generally, the hub, or central facility, is responsible for the training, education, and management of experts, some research and development, and the development and promulgation of standards. Spokes, or decentralized teams that reside within other programs,

identify and exploit local opportunities, all while sending updates to the hub. In the joint force, hubs could exist in unified commands or centers of excellence. Spokes would exist in tactical- and operational-level units.[33]

Changing organizational structure does more than concentrate talent, training, and authorities; it is also an important part of building bureaucracy that supports rather than constrains new organizational processes. Barry Watts and Williamson Murray speak to the "unavoidable necessity of bureaucratic acceptance to successful peacetime innovation. . . . Without the emergence of bureaucratic acceptance by senior military leaders, including adequate funding for new enterprises and viable career paths to attract bright officers, it is difficult, if not impossible, for new ways of fighting to take root within existing military institutions."[34] Organizational structures such as a hub-and-spoke system help incentivize bureaucratic acceptance by senior leaders serving in the hub, channel funding into necessary programs, and constitute one of the best ways to establish viable career paths.

Given the rapidly changing state of both civilian and military technology, the next war's initial salvos will likely include weapons never before fired in anger—and whose combined effect on warfare is difficult to predict. If the conflict lasts very long, it will shift into a race to adapt to those effects and gain a competitive edge in the new operational environment. Military and civilian innovators will quickly repurpose civilian technology for military use. The state that wins the race may win the war. If the United States wants to prevail, it needs to develop the ability to quickly identify challenges and opportunities, and then field new technology to meet them. **JFQ**

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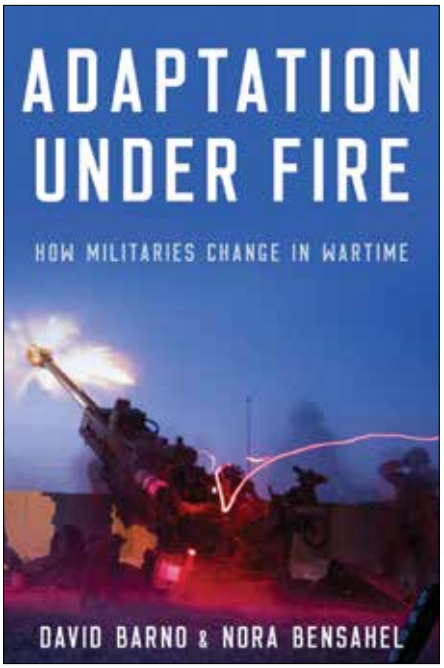


Adaptation Under Fire: How Militaries Change in Wartime
By David Barno and Nora Bensahel
New York: Oxford University Press, 2020
430 pp. $34.95
ISBN: 978-0190672058

Reviewed by Bryon Greenwald

In the 1970s, the late Sir Michael Howard cautioned military leaders that they would inevitably fail in predicting the conduct of the next war. What really mattered, he opined, was not getting it right, but not being "too badly wrong" and having the individual and institutional wherewithal to adapt to the new or revealed conditions of conflict in time to avoid defeat and ultimately prevail.

In *Adaptation under Fire,* Lieutenant General David Barno, USA (Ret.), and Dr. Nora Bensahel, frequent contributors to *War on the Rocks*, analyze this "adaptability gap" in the American Army with specific examination of doctrine, technology, and leadership at the individual and institutional levels during the wars in Iraq and Afghanistan. The book is a welcomed addition to the field. Although necessarily selective in its examples and case studies, it should generate ample discussion within the military Services and, importantly, their professional military education (PME) institutions.

The work unfolds in three parts. The first section provides a brief summary of the literature on prewar innovation and in-war adaptation, drawing heavily on the work of Allan Millett and Williamson Murray, Stephen Rosen, Barry Posen, and Adam Grissom. Additionally, Barno and Bensahel offer short illustrative examples of success or failure in the adaptation of doctrine, technology, and leadership to prepare the reader for the later analysis of the conflicts in Iraq and Afghanistan.

The second section, the heart of the book, provides the reader with a withering critique of the Army's performance, particularly at the institutional (big Army) level, in adapting its doctrine, accepting new/modified technology, and altering its strategic plans. Perhaps as expected, the individual Soldier and tactical leader (exemplified by Captain John Abizaid adjusting his company's tactical plan in Grenada in 1984) come off well, while the institutional Army performs poorly across all areas, with the possible exception of General David Petraeus's going around the Army bureaucracy to produce the 2006 Field Manual (FM) 3-24, *Counterinsurgency*, in record time.

In four excellent chapters, Barno and Bensahel hail the doctrinal and technical adaptability evident in the drafting of FM 3-24, the creation of Provincial Reconstruction Teams, the modification of Apache helicopter tactics to provide close air support in Afghanistan, and the MacGyver-like ability of those pilots in keeping their aircraft flying. Appropriately, they eviscerate the institutional Army (and Marines) for failing to accept the MRAP (mine-resistant ambush protected vehicle) and Palantir Technologies' intelligence system (over Distributed Common Ground Station–Army) earlier during the conflicts.

Regarding tactical leadership, they extol the adaptive thinking of then colonels Sean McFarland and H.R. McMaster in Iraq for changing their tactical approach and applying classic counterinsurgency doctrine in Ramadi and Tal Afar a year before FM 3-24 appeared, and Special Forces Captain Mark Nutsch, for his team's support of Uzbek warlord Abdul Dostum during the early days of Operation *Enduring Freedom*. They also offer withering criticism of Generals George W. Casey, Jr. (commander, Multi-National Force–Iraq, June 2004–February 2007) and David D. McKiernan (commander, International Security Assistance Force, and U.S. Forces–Afghanistan, June 2008–May 2009) for failing to understand the conditions of conflicts they were fighting and adapting their theater strategies to maximize U.S. and coalition opportunities for success.

The third section considers the challenges of future war, particularly the influence of the space and cyber domains; assesses the U.S. military's adaptability today; and recommends how the Department of Defense (DOD) and the Services could improve their individual and institutional adaptability. Their critiques and recommendations will find favor and raise questions. Regarding doctrine, they recommend that the joint force add "adaptability" as a principle of war, integrate adaptation and free play into major exercises, train and test units under degraded conditions, and emphasize resilience across the force. Concerning technological adaptability, they recommend that DOD restore rapid adaptive organizations such as the Strategic Capabilities Office and the Asymmetric Working Group, require all military technology operate in degraded (non-networked, no space link) environmental conditions, and sponsor an annual rapid-adaptation competition. To improve leadership adaptability, they advocate that the Services add it as a rated area on efficiency reports, expand the technical literacy of future commanders, and send more officers to an Advanced Civil Schooling program. And while their commentary on PME is episodic and perhaps dated, they are nonetheless correct in arguing that PME reform would advance adaptable thinking within the military.

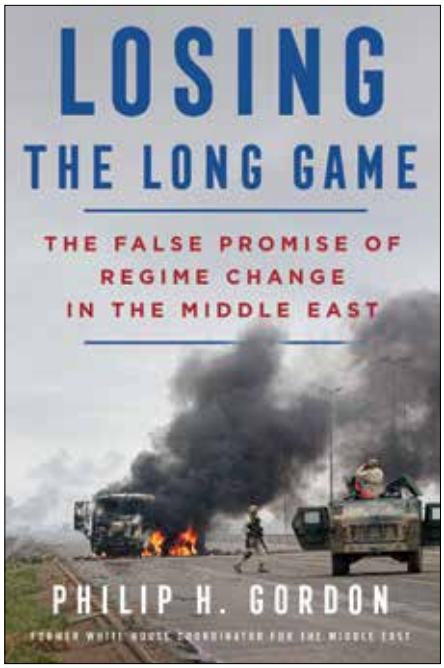
It is with this last recommendation that this reviewer, a retired senior officer

and PME administrator and instructor, quibbles slightly. *Adaptation Under Fire* tends to tar all PME with wide and indiscriminate brushstrokes. As they note, PME should be more academically rigorous, and even fail students, but in their critique the authors fail to acknowledge that some institutions, such as the Joint Advanced Warfighting School, conduct over 40 individual and collective assessments of students and routinely fail colonels out of the war college for academic (nonethical) reasons.

Barno and Bensahel argue for more civilian schooling to avoid the groupthink prevalent among uniformed faculty and students; but beyond stereotyping, they neglect to cite the increasing number of civilian faculty employed at those institutions for the express purpose of elevating academic rigor and infusing curricula with external ideas and attitudes. Like others, they also wistfully compare DOD's PME institutions to the Nation's best graduate schools, like the Johns Hopkins School of Advanced International Studies (SAIS), where they teach. For a host of reasons including mission, faculty, student body, political capital, and budget, this is an illogical comparison. SAIS has one of the best and most selective international relations 2-year master's degree programs in the country; its purpose is to prepare much younger students (average age 26, with 2-years of work experience) for lower level work in business and government. The mission of DOD's officer education enterprises, specifically its war colleges, is to educate and prepare almost 600 senior officers annually for positions of higher responsibility. Unlike very selective graduate programs, not every captain (O6) or colonel entering PME is an Einstein or Eisenhower. They are competent, tactically proficient leaders, but not all possess the inherent capacity to become strategic saviors. The task of PME is to improve the critical thinking and communication skills of those individuals such that they contribute to the Nation's defense at the next, if not perhaps the ultimate, level of military responsibility.

Adapting Under Fire is a solid and useful addition to the literature on innovation, adaptation, and change in the military. Its analysis of the wars in Iraq and Afghanistan are its most compelling and illuminating chapters, but its recommendations should and will generate much worthy conversation and debate. **JFQ**

Professor Bryon Greenwald, Ph.D., is the former Dean of the Joint Forces Staff College and a Professor at the Joint Advanced Warfighting School, where he teaches military theory, history, and innovation.



Losing the Long Game: The False Promise of Regime Change in the Middle East

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Reviewed by Thomas C. Greenwood

Few authors are more qualified to write on U.S.-sponsored regime change in the Middle East than Philip Gordon, who worked as Special Assistant to President Barack Obama for the Middle East (2013–2015) and as Assistant Secretary of State for European and Eurasian Affairs (2009–2013). His book, *Losing the Long Game*, is elegant, thoroughly researched, and comprehensible; it belongs on the syllabus of every war college and policymaker's desk for two reasons. First, the author shines a spotlight on the opaque (sometimes secretive) history of U.S.-sponsored regime change in the Middle East and, in so doing reveals many rich insights. Second, Gordon dispels the misguided notion that American exceptionalism endows the United States with unmatched foresight and wisdom to effectively reengineer Middle East governments in a way that advances U.S. national security interests, promotes regional stability, and strengthens the international order.

Gordon examines seven cases of regime change over the past 70 years: Iran (1953), Afghanistan (1979–1992), Afghanistan (2001), Iraq (2003), Egypt (2011), Libya (2011), and Syria (2011). They all failed to deliver the policy outcomes desired by Washington, made the Middle East more volatile, and more recently, were a strategic distraction from other emerging threats such as China and Russia.

The author explains that these failures did not result from impure U.S. motives (for example, take the oil and run) or even an unwillingness to double down by increasing troop levels and funding, which failed to save the day in either Iraq or Syria. Rather, once policymakers decide on regime change as their preferred option, "they overstate the threat, underestimate the costs and risks, overpromise what they can accomplish, and prematurely claim success if and when the targeted regime falls." Yet Gordon does not ignore the possibility that the costs of inaction (that is, of not intervening and undertaking regime change) could have been higher and more harmful over the long run.

Two of Gordon's most riveting ideas, however, are that regime change frequently fails because of the security vacuums it creates (filled by actors who are often more repressive than the toppled regimes), and the unanticipated consequences that escape rigorous

analysis by policymakers before they act: raising tension between armed opposition groups, disrupting the distribution of scarce resources, fostering long-term dependency on outside powers, and perpetuating the harmful optic that the United States is the self-appointed global cop.

Gordon uses the example of Libya to illustrate just how dangerous security vacuums can be. When Muammar Qadhafi's successor, Abd al-Hakim Belhaj—former head of the al Qaeda–affiliated Libyan Islamic Fighting Group—declared himself the leader of all liberation forces, other Western-oriented opposition leaders became infuriated and competing militias began killing each other. By June 2014, Libya had two competing governments backed by competing militias, and the country had descended into a multisided civil war with no end in sight.

Gordon is also equally damning about the ripple effect the moral hazard created in Libya had on Syria's rebel groups. The latter believed that by escalating violence, the world's most powerful militaries would intervene on their behalf. Sadly, instead of leading to Bashar al-Asad's ouster, it caused, "the greatest humanitarian catastrophe since World War II, a refugee crisis, the destabilizing of Syria's neighbors, the growth of the [so-called] Islamic State, and political spillover into Europe and beyond."

Gordon believes the following factors contribute to regime change failures: inadequate planning for what comes after regime collapse; U.S. forces being viewed as occupiers instead of liberators; not recognizing that local actors will pursue their interests first; regional neighbors seeking to destabilize new regime leadership; moral hazard created elsewhere; a general lack of U.S. knowledge about the Middle East; the difficulty of staying committed after intervening; unrealistic expectations about transplanting democratic values abroad; and a mistaken belief that throwing more money and troops at a problem will make it better. Unfortunately, these factors can become intertwined and unleash their own dynamics that neither the White House nor Pentagon can control.

The book's overall thesis would have been strengthened had Gordon discussed the limitations of regime change—a means to a higher end—within the context of U.S. grand strategy. Here, introducing G. John Ikenberry's idea of a "liberal hegemonic order" would have helped readers better understand why U.S. leaders of all stripes feel the messianic urge to spread democratic values around the globe—even if they can only be imposed by force and by violating other countries' sovereignty and right to self-determination.

After taking the reader on a journey of tears, the author recommends a policy alternative to regime change. It is a hybrid approach of practical measures including a mix of containment, deterrence, diplomatic engagement and support for partners, selective military action, arms control, and economic investment and "the restoration of the United States as a respected, prosperous, and democratic alternative [that] will produce better results than the pursuit of costly, quixotic and unrealistic campaigns to overthrow regimes."

Perhaps. But even if policymakers adopt the author's more robust menu of soft and smart power policy options, the temptation to undertake regime change will remain irresistible as long as America fails to internalize the hard lessons of the Middle East and remains wedded to a misguided sense of exceptionalism. **JFQ**

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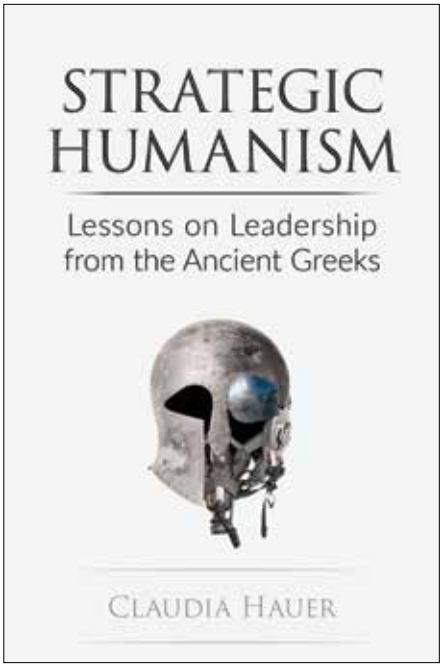

Strategic Humanism: Lessons on Leadership from the Ancient Greeks

By Claudia Hauer
Toronto: Political Animal Press, 2020
180 pp. $24.99
ISBN: 978-1895131444

Reviewed by Christopher Kuennen

At some point between the legendary Greek siege of Troy and the infamous defeat of Athens at Syracuse, the philosopher Heraclitus rather astutely discerned that *Êthos anthrôpôi daimôn* (Character is fate). His assertion might be thought of as a pithy distillation of the practical wisdom of ancient Greece. In *Strategic Humanism*, Claudia Hauer urges leaders to engage with this tradition; military officers and defense policymakers stand to gain not only theoretical insights from an attentive reading of the Greek classics, but also a way of perceiving the world and its conflicts as beyond total human mastery and yet shaped by the virtues and vices of human character.

Hauer's presentation of the value of humanistic study is especially compelling in light of the evolving implications of

artificial intelligence (AI) for the profession of arms. In February 2020, the Department of Defense (DOD) officially adopted five ethical principles to guide its ongoing development and use of AI: namely, that it be responsible, equitable, traceable, reliable, and governable. Though these principles are meant to embody "existing and widely accepted ethical and legal commitments," DOD has nevertheless recognized its need to better understand how to actually apply the principles. It is this perennial and important challenge of putting principles into practice that Hauer addresses in *Strategic Humanism*.

The primary obstacle to imposing ethical norms on the technical development and operational application of AI is the infinitely complex context in which practical choices occur. The finite aims and mechanisms of a given technology pose inherent obstacles to unfettered appreciation for the range of morally relevant factors surrounding its use in any particular situation. In the crowning chapter of Hauer's book, she emphasizes this fundamental lesson of Aristotelean ethics: "As something essentially interactive, moral action cannot be worked out in advance, prior to our immersion in whatever situation calls for our response." This condition of moral decisionmaking should influence not only the objectives of algorithmic design but also the manner in which tech developers and operators are trained in ethics. If there are no "categorical imperatives"—no universally applicable rules for judgment—then moral action demands a character capable of discerning what is best in any given situation. AI cannot be "ethical" if the human beings designing it and employing it lack a virtuous ethos, an excellent character.

Strategic Humanism presents Homer, Herodotus, Thucydides, and Aristotle as partners in an ever-fruitful dialogue aimed at educating such a character. Hauer argues that these thinkers provide an important check on the somewhat ironic, though widely influential, Cartesian prejudice against the role that human subjectivity plays in even the most rigorously scientific analysis. She draws on the account of King Croesus in Herodotus's *Histories*, for instance, to illustrate the danger of interpreting situational ambiguity according to a framework constructed of one's own preconceived hopes and biases. Herodotus recounts how around 550 BCE a mounting Persian threat prompted the Ionian Greeks to prepare for conflict. For his part, King Croesus of Lydia offered sacrifices to the Delphic Oracle for divine counsel. The oracle answered Croesus's supplications by predicting that if he attacked the Persians, a great empire would be destroyed. Croesus proceeded to begin a campaign against Persia—but in the end, it was his own empire that was ruined. According to Hauer, Croesus's failure exposes the limits of his interpretive imagination; he failed to consider how the particularities of his situation bore on the information at his disposal.

Since technology too has the effect of not only solving problems but also framing them in a specific way, our tools can sometimes impede our interpretive imagination, our ability to perceive all the factors relevant in making ethical decisions: "If all you have is a hammer, then everything looks like a nail." Indeed, reducing unintended bias (for example, for race or gender) is already one of the foremost topics in the discipline of AI ethics, and DOD directly addresses such bias in its own "equitable" principle. *Strategic Humanism* offers a strategy for expanding the moral imagination of its readers—including military AI developers and users—by putting key themes of the profession of arms in dialogue with the Greek humanists.

Hauer accomplishes her intended goal—"to familiarize the reader with a Hellenic way of seeing the world, in which character displays itself in action"—by exploring how the Greeks wrestled with such diverse and timely topics as vengeance, intercultural competency, and violent deterrence. Running through the collection of six essays that constitute *Strategic Humanism* is an insightful metanarrative that connects the fate of the ancient Greeks to their character, socially and individually. The power of Greek city-states grows as they use a common language to share stories of virtue and notions of the common good, and withers as utilitarian nihilism drives them to act out of self-interested fear. Hauer successfully demonstrates how engaging with the Greek classics can help broaden one's moral imagination, even as the technology one depends on might otherwise limit it.

Strategic Humanism draws on Hauer's time as a visiting humanities professor at the Air Force Academy, and though her work lacks explicit connections to many of today's most prominent defense issues (for example, warfighting in the space and cyberspace domains), her perspective manifests a perspicacious and broadly applicable awareness of the poverty of a technocratic approach to forming military minds. Especially as AI rapidly alters the pace and nature of our decisionmaking, we should take seriously the ability of the Greek classics to "liberate human judgment to reflect strategically on what we are doing."

Readers convinced by Hauer's account of the relationship between human character and technology can find additional insight in the work of AI ethicist Shannon Vallor, including in her *Technology and the Virtues: A Philosophical Guide to a Future Worth Wanting* (Oxford University Press, 2016). But even if you do not read Hauer or Vallor, heed their advice: read the Greeks. **JFQ**

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Waterborne Romanian troops prepare to move across Danube River as part of U.S.-led exercise Saber Guardian 2017, in Romania, July 17, 2017 (Courtesy NATOChannel, Jack Somerville)

U.S. Joint Doctrine Development and Influence on NATO

By George E. Katsos

Those possessed of a definite body of doctrine and of deeply rooted convictions will be in a much better position to deal with the shifts and surprises of daily affairs.

—Sir Winston Churchill

Joint doctrine captures and socializes fundamental principles that guide the Armed Forces in campaign activities and military operations. Moreover, its content forms the foundation for assisting partnerships such as the North Atlantic Treaty Organization (NATO) in its implementation of collective defense, crisis management, and cooperative security activities. Joint doctrine's importance is so influential that NATO modeled its own allied joint doctrine development system after it. While the library of U.S. joint publications (JPs) continues to be a steadfast repository of information, joint doctrine's Achilles's heel is its inability to reflect changes quickly

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enough to optimally serve today's generation of warfighters that is actively implementing policy. As such, it cannot drive rapid systemic changes in the NATO system. This article examines how the U.S. system is becoming more responsive to change and could influence NATO more quickly.

Military advice can often be conflicting unless coming from the same school of thought.[1] In 1985, a Senate Armed Services Committee staff report identified poorly developed joint doctrine as one of the symptoms of inadequate unified military advice.[2] Joint doctrine's purpose is to provide a common framework that U.S. military leaders refer to when providing advice to civilian counterparts and leaders. As a result of that report, at least in part, the following year Congress issued legislation that vested overall responsibility for U.S. joint doctrine development in a single individual—the Chairman of the Joint Chiefs of Staff (CJCS).[3] Shortly after, the Chairman placed joint doctrine and terminology standardization responsibilities in the Joint Staff J7. Over the next few decades, the joint doctrine development system brought together some of the brightest minds in the Department of Defense (DOD) to build a common foundation for the modern era of joint doctrine.

Joint doctrine is official advice and should be followed unless a commander determines otherwise. However, joint doctrine offers much more than guiding mission success; it informs DOD and allied personnel on joint warfighting capability improvements, senior civilian leadership on approaches to military workforce employment, and non-DOD and non–U.S. Government personnel on how the U.S. military perceives and interacts with their organizations.[4]

A recently published document by the Joint Chiefs of Staff (JCS) states that the U.S. military workforce requires leaders at all levels who can achieve intellectual overmatch against adversaries.[5] In the face of new geopolitical realities, expanding warfighting domains, emerging technical capabilities, and accumulating resource constraints, reflections on these issues are already challenging the doctrinal status quo.[6] From global integration to the competition continuum to creating a new military Service or adding members to the JCS, it is important that joint doctrine navigates leaders and readers away from outdated approaches that may not allow military workforces to adapt quickly enough. New challenges and anticipation of them—whether impacting cooperation or stemming from adversarial competition or conflict—are occurring faster and with less warning from more directions simultaneously and with far greater precision, lethality, and disruption than ever before.[7] While joint doctrine has served the United States and supported NATO efforts well in the past, its system must constantly be reassessed as to whether it is agile or responsive enough to meet the challenges presented by external factors that now drive change.[8]

In the past 30 years, the process of the U.S. joint doctrine development system is often described as a consensus-driven function that links together a capstone, keystone, and subordinate JP pyramid hierarchy based on traditional Joint Staff directorate lines of responsibility (J1, J2, J3, and so forth) through vertical and horizontal alignment. This system continues to survive waves of expansion, contraction, and reorganization.[9] The NATO system was originally structured on the U.S. model. It bins allied joint publications (AJPs) content in three categories: Level 1, capstone/keystone; Level 2, functional area publications that make up the AJP library; and Level 3, lower level publications. Both U.S. and NATO publications are developed within a consensus-based system.

The issue with a consensus-based system is that it usually drives to the lowest common denominator of agreement and is often seen as one interest group rolling another or the development of content watered down, losing original intent.[10] For the topics of library expansion and contraction, the iterative challenge is whether one process automatically course-corrects the other or whether correction has to happen with brute force. For library reorganization, the balance is fought between necessity and political will. Other challenges include the interpretation and separation of broad policy direction versus strict joint doctrine guidance, the expectations of individual subject matter experts versus enterprise gatekeepers (doctrineers and terminologists), and military Service capability relevance in the face of joint force integration.[11]

In order to be adaptable and better support allies, the U.S. joint doctrine community must refine its policies and streamline its procedures to address these and other challenges and overcome status quo tendencies. To reinforce both Alliance purpose and unity, the United States agrees to abide by certain NATO policies and procedures and participates in the allied joint doctrine development process. The following groupings provide an overview of U.S. and NATO systems and processes as well as potential efficiencies.

Twentieth-Century Growth (1905–1991)

U.S. doctrine can be traced back to the Civil War, but formal U.S. doctrine comes into focus in 1905 with the publication of Field Service Regulations (FSRs).[12] (European history also contains many individual doctrine writings, most from military scholars from the 18th century onward.) U.S. origins stem from the early 1920s Army and Navy joint action in pursuit of coordination during operations.[13] In 1939, FSRs were superseded by U.S. Army field manuals. During World War II, the Army developed its first military dictionary to improve interoperability among military Services and allies. In 1948, that document transformed into the first U.S. joint dictionary.[14] After World War II, Service-driven doctrine became the backbone for 29 JCS publications guided by joint action policy.[15] While the nomenclature system was at best random, the JCS publication footprint and subsequent 1959 guidance on united Armed Forces action policy informed the modern 1991 JP library structure. Through this period, the Services were still given wide latitude in JP development responsibilities. While NATO early on had communications,

Croatian soldiers discuss logistics during Immediate Response 19, co-led by Croatian armed forces, Slovenian armed forces, and U.S. Army Europe, in Croatia, May 27, 2019 (Courtesy NATO)

technical, and other publications, in 1958 it also developed its first official glossary of NATO terms and definitions subsequently published in the 1959 U.S. dictionary of military terms, further strengthening the foundation of cooperation between entities.[16]

Post–Cold War (1991–2000)

Before the 1986 National Defense Authorization Act, there was no individual responsible for U.S. joint doctrine development. There was no standard process for initiating, coordinating, approving, or revising joint doctrine. Moreover, there was no requirement for congruity between joint and Service doctrine, nor was the difference between joint and Service doctrine clear. Significantly, there was no mechanism that incorporated the expertise and knowledge that commanders were expected to use. In addition, the joint doctrine development system had no means of either identifying or addressing doctrinal voids.

Joint doctrine was also published without formal evaluation. Initially with approximately 58 JPs in 1988, development continued; however, command staffers years later found it difficult to maneuver through joint doctrine's 120-plus approved and emerging JP titles. In essence, readers did not know where to start or what they needed to know.[17] NATO's development policies and architecture formulated in the mid-1990s had approximately 35 AJPs and were built and based on the U.S. model.[18]

At one joint doctrine semiannual conference, General John Shalikashvili personally addressed the U.S joint doctrine community and certain NATO attendees about the joint doctrine development system and process being stovepiped, time development horizons too elongated, and library subject matter unorganized (and of lesser quality and consistent content).[19] Compared to previous practices, the Chairman was now solely responsible for joint doctrine development and, through the J7-managed development system, refined its process and established new definitions, procedures, processes, and structures along with refining key positions (that is, lead agent, primary review authority, JCS doctrine sponsor, coordinating and technical review authorities).[20] Moreover, not only did J7 lead the effort to organize the joint doctrine library structure, but it also spearheaded ongoing JP consolidation and creation. This change brought structural logic to the joint doctrine library under traditional JCS directorate lines of responsibility, while new JPs filled joint doctrine gaps in support of joint operations.

Additionally, combatant command involvement was now mandatory, and the 5-year JP revision cycle required content consistency within and without

revised JPs. As such, the J7 began to exercise a more assertive role to include JCS directorate involvement and to keep them active in the process while the Services adhered to the primacy of joint doctrine.[21] Overall, actions taken between 1991 and 2000 got the U.S. joint doctrine house in order.

For allied joint doctrine development, the J7 Joint Education and Doctrine Division was responsible for ratifying Levels 1 and 2 AJPs for the United States. The J7 also ensured U.S. joint doctrine was used as the initial basis for U.S. inputs during NATO Levels 1 and 2 AJP staffings and worked with multinational partners and U.S. representatives to minimize impacts of variances between the United States and NATO. Other DOD entities were responsible for Level 3 allied publication ratification. The J7 also acted as the U.S. Head of Delegation for allied joint doctrine and terminology standardization purposes at the NATO Military Committee Terminology Board and Allied Joint Doctrine (AJOD) working group. NATO foreign liaison and exchange officers on the Joint Staff also attended and briefed at the semiannual joint doctrine planners conference, thereby staying informed of U.S. military workforce challenges and improvements and using lessons learned to improve their own allied joint doctrine development system.

9/11 (2001–2010)

On September 10, 2001, the Joint Staff J7 published JP 3-0, *Joint Operations*, and the *Joint Doctrine Capstone and Keystone Primer*.[22] Linked to existing strategic guidance and the primacy of traditional approaches to warfare (violence used to dominate opponents), the very next day these two documents became obsolete in the preparation for conflict with state and nonstate actors and their irregular approaches to offsetting dominant opponent advantages. The response to the terrorist attacks of September 11, and the subsequent second conflict with Iraq, generated a strategic shift in policymaking that overcame a nonexistent National Defense Strategy (published in 2005) and an out-of-date National Military Strategy (published in 1997 and replaced in 2004).[23] While strategic guidance took its time to arrive, so did its impact on joint doctrine.

The U.S. joint doctrine library retained its hierarchy with a capstone JP underpinned by six keystone JPs supported by a subsequent layer of subject matter JPs. Changes to joint doctrine's keystone layer of JPs were slow to appear, based on traditional versus irregular content after 9/11, as the joint force awaited senior-level policy guidance. A reissuance of JP 1-0, *Joint Personnel Support*, took almost 5 years; JP 2-0, *Joint Intelligence*, almost 7 years; JP 3-0, 5 years; JP 4-0, *Joint Logistics*, 6 years; JP 5-0, *Joint Planning*, 5 years after 9/11 and over 2 years after the planned invasion of Iraq; and JP 6-0, *Communication Systems*, over 4 years. Most concerning, however, was that joint doctrine's capstone document, JP 1, *Doctrine of the Armed Forces of the United States*, took years to be reissued, waiting for National Defense Strategy and National Military Strategy direction and publication. Regardless of national limitations in strategy formulation, the aforementioned senior-level JPs were what U.S. military planners and operators went to war with both in Afghanistan (2001) and Iraq (2003).

NATO's joint doctrine development system began similar to the U.S. one but has significant differences that influenced its evolution. One difference is that NATO manages voting participation from individual nations with their political influences compared to the U.S. system managing DOD voting organizations (combatant commands, military Services). Another is that NATO allows its military committees to formulate and catalogue both doctrine and policy terminology, while the United States eventually halted that practice and generated criteria for joint doctrine terminology primarily from JPs.

For the U.S. process, joint doctrine development managed the JP life cycle adequately, but with multiple draft benchmarks, many JP dates did climb well beyond the 5-year threshold. Joint doctrine revision and production time horizons were so long and slow that there was a demand to send out draft joint doctrine to push updated information to the warfighter quicker. The NATO process was similar in time and steps. To address revision practices and library expansion, the U.S. joint doctrine enterprise not only refined procedures but also embarked on its second consolidation effort to reset the JP library structure by decreasing it by over 33 percent. This reset was similar to the first organization—forced by circumstance, but with J7 now advocating for top-down driven approaches both to protect resources and for its process to be more responsive to change and to the warfighter.[24] To further expedite joint doctrine development, a test publication process was refined that became a vehicle for field-testing validated joint concepts.

Both U.S. and NATO processes provided more opportunities for individual publication consolidation and quick revision. While these processes were born 10 years apart and the models operated similarly, there was a year-and-a-half lag time for NATO to capture related changes made in the U.S. system. Moreover, a joint doctrine survey to the joint force revealed the size of, and impact to, full-time staffs and government billets dedicated to joint doctrine development. This survey opened the aperture for future discussions on what and how much product the joint doctrine development community should or could focus on. Additionally, the irregular warfare construct finally began to make its way down from policy into filling voids in joint doctrine.[25]

While J7 socialized more top-down changes, community consensus limited progress. Efforts did bear fruit, however, with the standardization of military terminology. As an ever-expanding doctrinal dictionary was impacted by policy term infiltration from DOD directives and NATO proposals, this lack of clarity in and protection of the DOD dictionary added much confusion as to who was in control of the language that U.S. military forces used to communicate with each other.[26] As a result, the dictionary changed focus to reflect well-vetted JP glossary doctrinal terms with acceptance

of senior-level policy terms that filled temporary gaps in joint doctrine development. While the strategic surprise in this era of the 9/11 attacks showed how slow the joint doctrine development process and system were to change, the example of exercising a top-down approach with terminology cascaded into subsequent reform efforts in joint doctrine formulation.[27]

For organizational purposes, U.S. Africa Command (USAFRICOM) stood up in 2007 and became a part of the joint doctrine development community. As more U.S. military support activities occurred on the continent, USAFRICOM's area of responsibility brought new perspectives on doctrinal gaps relating to civilian populations on the move from natural and manmade threats.[28] NATO also created bilateral strategic commands. In support, the U.S. European Command commander served as the Supreme Allied Commander, Europe, and the U.S. Joint Forces Command commander served as the Supreme Allied Commander, Transformation (SACT), with command over force development activities including doctrine development and NATO's centers of excellence.[29] Additionally, former Warsaw Pact nations began to join NATO, increasing the numbers of allied joint doctrine voting members, and France rejoined NATO's integrated military command structure.

The Next Decade of War (2011–2020)

The publication of the titles *Decade of War* and *Lessons Encountered* exposed that military forces and leaders had to change their approaches to working with civilian-led organizations.[30] While the incline was real, some writers credited the joint doctrine enterprise with being one of two remaining U.S. Government Beltway entities that consistently reached out to cooperate with civilian-led organizations on whole-of-government efforts. Richard Hooker and Joseph Collins wrote, "Unfortunately, emphasis on working whole-of-government issues is fading across the U.S. Government, except in the field of joint concept and doctrine development."[31] Furthermore, J7 addressed previous reports on the lack of interoperability with interagency stakeholders by cooperating with them to build the first *Joint Guide for Interagency Doctrine*. Released in 2019, the guide expanded on current knowledge and assisted in the strategic art of navigating government bureaucracy to make workforces collaborate more efficiently in pursuing national policy objectives. Additionally, J7 formulated an annual call process that many of these civilian-led organizations now have as a direct link to the highest levels of the U.S. military for the first time through the joint doctrine development process.[32] In this process, interoperability improved between workforces through input on joint doctrine assessments and draft JPs that reflect organizational perspectives and interaction that put civilian organization perspectives in front of senior military leaders and warfighters.

In pursuit of resource efficiencies, some progress in reorganizing JP content to the warfighter was stunted by support for, and translation of, outdated restrictions and policies. In turn, J7 adopted a more assertive top-down approach to joint doctrine development under a senior-level initiative termed Adaptive Doctrine. Under Adaptive Doctrine, J7 instituted a more agile process to optimize the JP library in becoming more adaptable and flexible in organization as well as meeting joint force demands to best support joint operations and not be overrun by individual communities of interest. The J7 reduced its library 15 percent over the last 2 years.

Annually, JPs are now selected for revision by the joint doctrine development community based on necessity and importance. This approach removed the traditional 5-year JP time horizon revision cycle. With an annual master priority list and new single draft system, changes streamlined the revision process, putting JPs that fell under annual cut lines and those with similar content to other JPs as well as others with older dates under more scrutiny.

For library reset purposes, J7 split its capstone JP into two volumes, an evolving one that reflects senior-level guidance and a static one that is concerned with theory and foundations. JP 3-0 continued its vertical alignment with JP 1, but now other keystones align horizontally with JP 3-0 to best support it. The primacy of individual keystones now reinforces subsequent vertical alignment. Library organization now has reinforced logic and can support top-down directed policy insertion placement. Procedures now support updating doctrinal expertise from multiple sources into a specific JP with a one-time horizon. Under Adaptive Doctrine and new business rules, the United States cut 8 to 10 months off staffing timelines, removed lower level staffing that subsequently emphasized 06/planner-level involvement, and supported one product per routine revision in 12.5 months with the development stage as well as more streamlined U.S. staffing efforts on NATO Levels 1 and 2 publications without losing quality.

While some challenges persist, progress was made on issues that existed in the previous decades. J7 initiated joint doctrine notes to encourage still emerging ideas. Standardized terminology and the DOD dictionary received more protection from policy term infiltration by housing it as an appendix in the CJCS-signed JP 1. Consolidation and top-down action reversed hierarchy structural erosion that made keystones weaker than subsequent hierarchical JPs. Campaign schedule and plan efficiencies countered sequestration and resource constraints. Strategic guidance and countering adversarial practices content were captured faster through change processes, top-down driven actions, and mid-year schedule and plan corrections. Furthermore, library reset put in motion the system's third consolidation effort via top-down guidance, but this time with an automatic 5-year reset disclaimer that protects the joint doctrine development community from future burdensome practices, driving the community toward evolution and away from permanent stasis and automatic expansion.[33]

Since 2011, NATO's AJP library has increased 23 percent. NATO's routine development stage estimate timeline is

now 8 months longer than the recently shortened U.S. model with more staffing products. This divergence not only affects national resources in both systems but also brings to light the opportunity for efficiencies. The best example is that the United States began the process of combining content from five standing JPs on joint intelligence under one JP with a single time revision horizon. NATO, however, remains at 10 Levels 1 and 2 joint intelligence–related AJPs with 10 different time revision horizons to update the complete joint intelligence doctrinal footprint. Additionally, multiple drafts push off senior officer input until the end of the process. The number of custodians, revisions, and ratification commitments of intelligence AJPs and other sources should generate reassessment of national resource commitments to non-U.S. efforts. NATO has also expanded its membership to 30 nations, all with voting rights in allied joint doctrine development.

For military organizational structure, the doctrine development community added the National Guard Bureau, U.S. Cyber Command, U.S. Space Command, and U.S. Space Force as voting members. U.S. Joint Forces Command was disbanded in 2013 and NATO's SACT responsibilities transferred to a French general officer. Joint Warfighting Center doctrine personnel now fall under the Joint Staff J7 Joint Education and Doctrine Division. The DOD Terminology Program reformed and implemented new policy that streamlined 75 percent of the DOD dictionary content and encouraged the U.S. Government to build and publish its own compendium of interagency terms.[34] Furthermore, program managers for both DOD terminology and allied joint doctrine development assist in senior-level guidance and influence efficiencies and resource protection.

Soldier from North Macedonia in full "ghillie suit" camouflage during Immediate Response 19, in Croatia, May 29, 2019 (Courtesy NATO)

Top-Down Approach

U.S. and NATO joint doctrine system and process challenges are not isolated. Other areas, such as U.S. policy, strategy, and plan formulation, face similar impediments to becoming more agile and innovative in the face of today's complex threats. Former Under Secretary of Defense Michèle Flournoy testified to Congress about defense policy formulation becoming a "bottom-up staff exercise [that] includes hundreds of participants and consumes many thousands of man-hours, rather than a top-down leadership exercise that sets clear priorities, makes hard choices, and allocates risk." The late Senator John McCain (R-AZ) stated:

development . . . in DOD has become paralyzed by an excessive pursuit of concurrence or consensus. . . . Innovative ideas that challenge the status quo rarely seem to survive the staffing process as they make their long journey to senior civilian and military leaders. Instead, what results too often

U.S. Marine with Marine Rotational Force-Europe 21.1, Marine Forces Europe and Africa, stands watch during cold weather training in preparation for Exercise Reindeer II, in Setermoen, Norway, November 12, 2020 (U.S. Marine Corps/William Chockey)

seems to be watered-down, lowest common denominator thinking that is acceptable to all relevant stakeholders precisely because it is threatening to none of them.[35]

While U.S. systems face procedural challenges in the speed of decisionmaking and content dissemination, a top-down approach could further explore and forcefully emplace improved organizational results.

Next 30 Years

Given the last decade, it is important to continue capturing and formulating content on adversarial approaches and competitor influences and how military force is applied, whether tied to conflict or not.[36] In order to further reduce and eliminate policy and process imperfections, the new 5120 Series CJCS Instruction and Manual will establish a more explicit top-down approach that sets boundaries for the Joint Staff to be more assertive in managing change. The policies will empower process owners to consolidate or cancel publications at any stage of the JP life cycle, better navigate the process of updating like-minded information simultaneously, and save the joint doctrine community thousands of hours and free hundreds of thousands of man-hours for other priorities in joint doctrine development. Conservative estimates show that a routine full JP revision cycle costs approximately $300,000 ($100,000 per full revision of NATO AJP) and 8,000 man-hours (2,000 man-hours and 500 custodian hours per full revision of NATO AJP). Per the old 5-year JP cycle, documents lined up in a queue regardless of topic. Now, communities can commit their expectations and resources toward topics of necessity and importance.

A new committed approach to consolidation and library reset could update the full library in 3 years or less. Moreover, joint doctrine was disseminated as hard copies. Distribution went from mailing copies to compact disc management and then to Web page access and downloading. Looking toward the future, more U.S. joint doctrine will be considered sensitive and protectable behind firewalls with limited access.

For NATO, there is a huge efficiency in allied joint doctrine gained using the new U.S. JP 2-0 as a strawman for intelligence allied joint doctrine reorganization. NATO could also explore moving away from its 30 voters, at least in the AJOD, and move toward strategic

and subordinate commands as voters to remove barriers. U.S. and NATO challenges to be aware of and navigate are strict U.S criteria-based terminology approaches that at times run into being subordinate to international laws and agreements, U.S. enterprise proposals compared to NATO standardization and national influences, and the capacity of U.S. support versus sustainable maintenance, especially within identified burdensome work practices.[37] In this, NATO's Allied Command Transformation and Military Committee Joint Standardization Board could strengthen the AJOD's role as the chief operations officer of allied joint doctrine development by driving top-down approaches to change library organization, policy and process formulation, standard agreement streamlining, and system implementation to effect real change in pursuit of a successful comprehensive approach. Furthermore, there must be an understanding that national resource commitments must be reviewed in light of resource constraints.

In totality, the U.S. joint doctrine development system is entering a third 30-year time period for library reset (1959, 1991, 2020). Joint Staff J7, with new policies and a vision for the future, will be better positioned to generate more practical decisions and informed recommendations to leadership, provide a quicker response to policy guidance demands, harmonize with allies such as NATO, and present a more organized and logical joint doctrine library to warfighters to best support joint operations. **JFQ**

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Joint Publications (JPs) Under Revision (to be signed within 6 months)

JP 1-0, *Personnel Support*

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JPs Revised (signed within last 6 months)

JP 1, *Doctrine for the Armed Forces of the United States, Volumes 1 and 2*

JP 3-05, *Special Operations*

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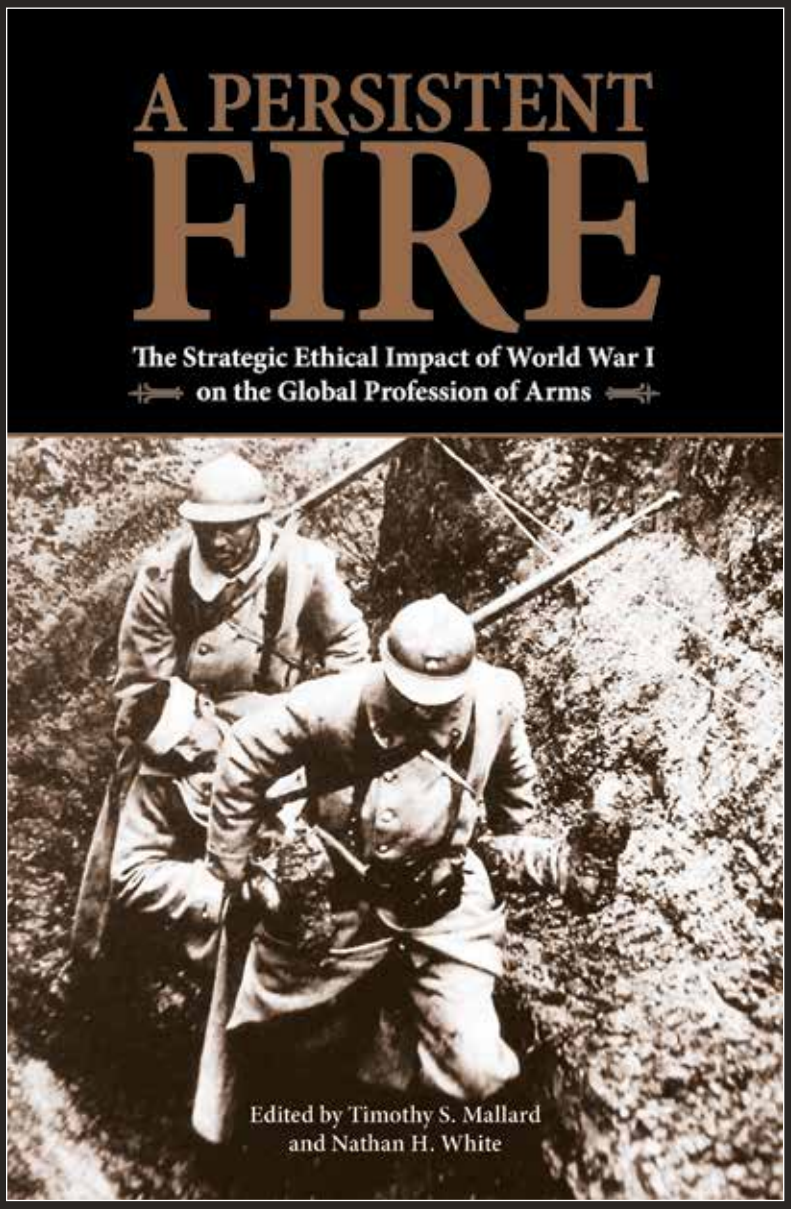

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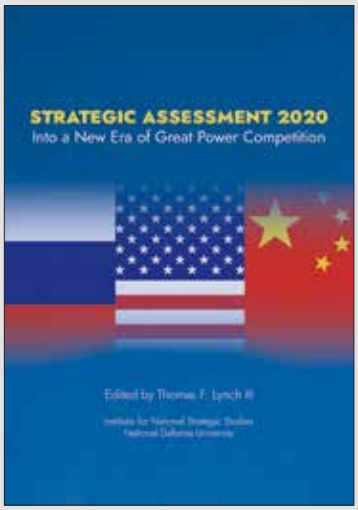

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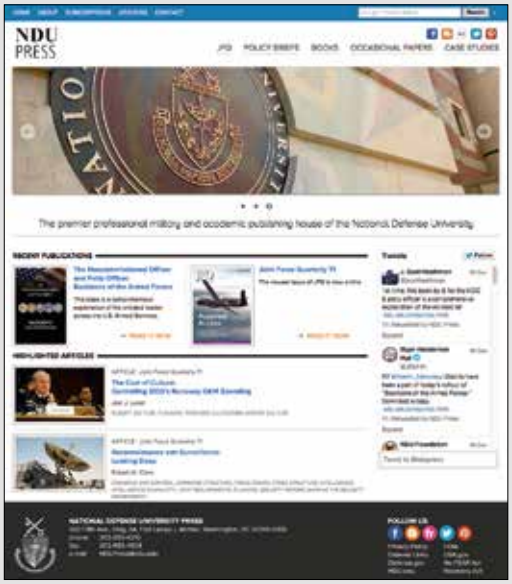

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