

Col. James Stultz, brigade commander of 2nd Brigade Combat Team (Strike), 101st Airborne Division (Air Assault), briefs key leaders during a combined arms rehearsal prior to assaulting an objective during Operation Lethal Eagle 24.1 at Fort Campbell, Kentucky, on 25 April 2024. During the exercise, Strike tested and fielded a prototype of the U.S. Army's new mobile brigade combat team, an organizational structure being implemented as part of the Army's "transformation in contact." (Photo by Sgt. Caleb Pautz, 101st Airborne Division [Air Assault])

Continuous Transformation Transformation in Contact

Gen. James E. Rainey, U.S. Army

We've learned a lot of lessons ... one of the things we want to start doing is transforming in contact, so we can start getting after some of these changes almost immediately. —Gen. Randy George, 5 February 2024 ur country and its allies are competing with determined adversaries during a period of unprecedented technological change. To guarantee our security, we must recognize change and



(Figure by Army Futures Command)

Figure 1. Three Periods of Time for Transformation

adapt faster than any army in the world. We are not preparing for a theoretical future fight. The struggle for advantage is now. This article is the first in a three-part series on how we win.

Before we ask how warfare is changing, we should take stock of what is not changing. First, because war is a human endeavor, people matter most. Second, people live on land. Thus, armies must be able to seize and hold land. When they do, close combat is unavoidable. That means the ability to close with and destroy the enemy on land is decisive. Third, wars are unpredictable. No one can guarantee a war will be short or that it will not escalate. Finally, the United States abides by the law of armed conflict. We must build our force accordingly.

At the same time, civilian and military technologies are changing at a pace not seen since before World War II. Because armies adapt, new technology is rarely decisive in the ways people predict.¹ But, it is disruptive in that it changes how military forces operate, organize, and equip.

As technology makes warfare more complex, the difference between skilled and unskilled armies becomes more pronounced. The real impact of technology is that it will increase punishment of unskilled commanders and untrained formations. The consequences of failure to adapt will be severe.

We Only Have One Army

Transformation is challenging because we only have one Army. This Army must conduct current operations, generate ready forces, and transform simultaneously. Transformation efforts are directed toward three periods: capabilities we need in less than twenty-four months, capabilities we need in roughly two to seven years—the time frame for defense budget planning—and capabilities for the deeper future (see figure 1). The three periods are inextricably interrelated since decisions about one have implications for the others.

In this context, a *capability* is the ability to do something on the battlefield.² This requires having people organized, trained, and equipped to do it. Thus, technology is not a capability by itself. Capabilities come from formations, and developing a new capability requires action across doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P).

Transforming the Army starts with operational units *transforming in contact*, solving problems, and seizing opportunities today. It also depends on *deliberate transformation*—efforts managed through Army-level processes to deliver the Army we need within the time horizon for defense programming. All the above occurs within the context of *concept-driven transformation*, which is the longer-term vision described in the Army's emerging warfighting concept.

Flexible Requirements and Fiscal Agility

The principal obstacle to transformation in contact is programmatic. It takes the Army about two years to approve a requirement and get funding added to the budget for a new system, even for existing technology. But the Army is increasingly reliant on AI-enabled robotics and other technologies that evolve much faster than that. As a point of reference, in the first two years after Russia's large-scale invasion of Ukraine, drone warfare evolved through four generations as the tactics and technologies changed.³

In some cases, when we document the requirement for a capability, the only thing we know with certainty is that what we need in two years will be different. The result is that we must fund requirements before we fully understand them. Later, when we fully understand the requirement, it is too late to change what we funded (see figure 2).

Our lack of fiscal agility comes mostly from necessary bureaucracy—sound processes that allow time for consultation among Army stakeholders, higher-level review, and congressional oversight. But the Army must be able to integrate an existing technology into an operational unit in less than twenty-four months. During war, this will require even greater speed. We can build that capability into the Army now. It starts with thinking differently about how we write requirements and fund programs.

An Illustration

The iPod music player was one of the most successful consumer electronics products ever sold. But, within eight years of the first sale, smartphones were already making them obsolete. What if that had been a warfighting technology? By the time the Army approved the requirement, funded it, and completed the multiyear effort necessary to develop, test, and start fielding a military-grade version of the system, it would be well on the way to obsolescence. Some soldiers might already be using a better commercial solution at home.

In that scenario, the Army would have two bad options. We could continue buying systems that would be obsolete before they finished fielding, or we



could cancel contracts with industry partners and give soldiers nothing while we run a new requirement through the process. We could not nimbly pivot an acquisition program based on a requirement for a music player to a system so different as a smartphone. Army requirements documents are not written that broadly. Neither are the associated funding documents nor contracting arrangements.

A smartphone is a completely different tool from a music player. A requirement that could accommodate both might be problematic. Nevertheless, when tactics and technologies are evolving quickly, the Army needs to be able to evolve capabilities without restarting the process.

You Get What You Ask For

The solution is to develop requirements documents for a capability rather than a specific type of system and to manage program funding the same way.⁴ This is what Mike Brown, then director of the Defense Innovation Unit, was discussing during congressional testimony in April 2022 when he proposed a "capability of record" approach for systems like small drones.⁵ In their January 2024 report published by the Atlantic Council, the number one recommendation from the Commission on Defense Innovation Adoption was similar. They recommended piloting a "capability portfolio model."⁶ If we communicate well with Congress, the Army can do this now.

Increasing our fiscal agility will also increase speed to capital for small- and medium-sized companies whose help we need. Sixty years ago, two-thirds of U.S. research and development was federally funded.⁷ Today, only one-fifth is, and many technologies we need are developing fastest in the commercial space. Defense primes built their business models around Department of Defense processes because they build things only the Department of Defense buys. In the future, the Army will be increasingly reliant on companies that do not traditionally do business with the government and do not have to. We cannot tell these smaller companies that we need their technology but cannot pay for two or more years. They are moving too fast.

However, agility is not right for everything. When the Army needs to develop and manufacture a large system that does not exist on the commercial market, like a tank, the requirement can't be vague or frequently changing. These systems require years of development and large capital investments from industry. Success requires stable requirements and predictable funding. The agile, capability-focused approach is right for smaller tranches of lower-cost systems that have a rapid technology refresh rate and no major DOTMLPF-P implications.⁸

Perfect Is the Enemy of Good Enough

In many cases, we are allowing the aspirational to stand in the way of the doable. There are technologies that would be useful in our formations right now but are not yet fielded because we are waiting until they can do even more. New technologies with game-changing potential should be in operational units as soon as they are useful, even if only in small quantities of minimum-viable products. This accelerates development of the technology, but it also lets us learn how to best employ it and how to adapt our formations and training accordingly. Most importantly, it gives leaders experience using the technology as it evolves.

We can take a lesson from the development of military aviation. The world's first military airplane was the Wright Military Flyer, purchased by the U.S. Army in 1909.⁹ It would be another twenty years before airplanes had the range and payload to start fulfilling their full potential. But the Army did not wait until airplanes could sink battleships to start fielding them. We fielded meaningful numbers for limited roles like reconnaissance. That developed the industrial base for military aviation and informed future requirements. It also ensured that, by the 1930s, the Army had a generation of officers who had grown up using the technology.

Today, we are in a similar place with AI-enabled robotic systems. We are years from the time that an uncrewed vehicle can keep up with an Abrams tank moving cross-country at full speed. And, we will not pin a Ranger tab on a robot anytime soon. But we can put uncrewed systems to good use as part of human-machine integrated formations this year.

Think Big, Start Small, Go Fast

Formation-based transformation orients capability development on how people are organized, trained, and equipped—as a holistic solution—rather than orienting on equipment and then accounting for the other DOTMLPF-P implications of the change. The best way to do this is to put cutting-edge systems directly into

our fighting formations, where they can be useful to soldiers today and mature in the laboratory of the real world.

If a system is safe and, in the assessment of the company-level leaders burdened with it, useful enough to be worth the work of having, it is a candidate for fielding—at least to a few brigades. What units learn will then inform how formations are organized, trained, and equipped only a few years later. The Army is doing this now, allowing operational units to purchase commercialoff-the-shelf equipment and experiment with innovative combinations of tactics and technology.

Gen. James E. Rainey, U.S. Army, is the commanding general of U.S. Army Futures Command. He previously served as the deputy chief of staff, G-3/5/7, for the U.S. Army in Washington, D.C.; as the commanding general of the U.S. Combined Arms Center, Fort Leavenworth, Kansas; and as commander of the 3rd Infantry Division, Fort Stewart, Georgia. He holds master's degrees in advanced military arts and science from the School of Advanced Military Studies at Fort Leavenworth and in public administration from Troy University. He led soldiers during numerous combat tours in both Iraq and Afghanistan.



Today, the priority is simplifying our warfighting formations' command-and-control (C2) networks and fielding human-machine integrated (HMI) formations.

The C2 network is central to everything we do on the battlefield. The first step to improving the network is reducing the complexity of the systems currently fielded in fighting formations. We are doing that now, streamlining C2 to reduce the burden on lower echelons and ensure compatibility across the Army. To be ready for 2030 and beyond, we must move to a software-centric C2 warfighting system very different from what we use today. The key to building that will be designing the system to continuously evolve and getting it into operational units so warfighters and engineers can develop it together and iteratively.

The secretary of the Army announced the Army's HMI formations initiative in October 2023, saying,

[W]e are beginning a new Human-Machine Integrated Formations initiative. These integrated formations will bring robotic systems into units alongside humans, with the goal of always having robots, not soldiers, make first contact with the enemy. This will shift some Staff Sgt. Stetson Manuel, a robotics and autonomous systems platoon sergeant from Alpha Company, 1st Battalion, 29th Infantry Regiment, 316th Cavalry Brigade, carries the Ghost-X Unmanned Aircraft System after its flight during experimentation as part of Project Convergence–Capstone 4, 11 March 2024 at Fort Irwin, California. (Photo by Sgt. Charlie Duke, U.S. Army)

of the work onto robots so that soldiers can do what only humans can: make values-based decisions, accept risk, and practice the art of command.¹⁰

Human-machine integration is combining people with uncrewed systems—ground and air—in ways that optimally employ both. The goal is not to replace soldiers with machines but to offload risk and work to machines so that soldiers can do what only people can do. That includes exercising judgment and ethical decision-making, and practicing the art of command.¹¹

The Army will develop HMI formations by putting capabilities in operational units, and learning and updating requirements in real time. While version 1.0 is in a brigade combat team, version 2.0 might be in trials with the opposing forces unit at the National



Training Center. Meanwhile, version 3.0 can be in field experimentation with the Maneuver Center of Excellence, and version 4.0 can be on the drawing board. All the above will be a collaboration involving Army scientists and engineers, industry partners, acquisition program managers, capability developers, and operational units. The result will be a continuously improving, full-DOTMLPF-P solution that integrates state-of-the-art technology quickly and discards bad ideas just as fast.

The Army can do this because we will write requirements documents for capabilities rather than *s*pecific types of systems, fund them by capability portfolio, and keep the fielding effort at a manageable scale. That means fielding in small tranches, iteratively, rarely fielding a system to the entire Army. This will also open competition to smaller companies that are designed to turn engineering redesigns quickly—companies that want to sell more than a few prototypes but don't need multiyear production of high-price systems to justify their research-and-development investment.

Putting It All Together

We must develop the ability to adopt and integrate technology faster. But new technology is not transformational by itself. To fully exploit the technology's potential, we must change how we operate, organize, and equip with it. That means accounting for every element Soldiers assigned to the 1st Battalion, 29th Infantry Regiment, based out of Fort Moore, Georgia, take part in a human-machine integration demonstration using the Ghost Robotic Dog and the Small Multipurpose Equipment Transport (SMET) during Project Convergence–Capstone 4 at Fort Irwin, California, on 15 March 2024. The robotic dog is a midsized, high-endurance, agile unmanned ground vehicle that provides enhanced reconnaissance and situational awareness supporting soldiers on the ground. The SMET is an eight-wheeled, enabling robotic technology serving as a "robotic mule" with the flexibility to operate in combat, combat support, and combat service support operations. (Photo by Spc. Samarion Hick, U.S. Army)

of DOTMLPF-P together as a holistic solution. The best way to do this is to orient capability development on formations. In other words, we buy equipment but fight formations, and the Army's transformation must be *formation-based*.

For this reason, an essential element of transforming in contact is unit innovation: warfighting formations using new combinations of tactics and technology to solve problems and create opportunities from the bottom up. How can a division operating in the Indo-Pacific simplify its communications networks, slim down command posts, and sustain itself while distributed? How can an infantry brigade operating in Europe use creative combinations of drones, loitering munitions, rockets, and precision-guided missiles to defeat an armored attack? What can we give our formations operating in the Middle East now to help them defend against drones?

To support unit innovation, the Army's transformation enterprise must be more agile. We can do that now, within existing processes, by doing three things. First, we must develop requirements documents for capabilities instead of specific types of systems and fund them the same way. Second, we must field meaningful quantities to operational units as soon as they can be useful. Third, we must develop holistic DOTMLPF-P solutions iteratively so that those solutions can update as fast as their underlying technologies. This approach fully engages the operational force in Army transformation and expands competition in the industrial base.

Transforming in contact must not be reactive. Investments we make today have a ripple effect on the future, creating some options and foreclosing others. They must be informed by our plans for deliberate transformation and concept-driven transformation. These are the topics of the next two articles in this series.

Notes

Epigraph. Randy George, "A Conversation with Gen. Randy George, Chief of Staff of the U.S. Army," War on the Rocks, 5 February 2024, <u>https://warontherocks.com/2024/02/a-conversation-with-gen-randy-george-chief-of-staff-of-the-u-s-army/</u>.

1. Stephen Biddle, "Back in the Trenches," *Foreign Affairs* 102, no. 5 (September-October 2023): 159, <u>https://www.foreignaffairs.com/ukraine/back-trenches-technology-warfare</u>.

2. J-8/Joint Capabilities Division, Manual for the Operation of the Joint Capabilities Integration and Development System (Washington, DC: Department of Defense, 30 October 2021), GL-15, https://www.dau.edu/sites/default/files/2024-01/Manual%20-%20 JCIDS%20Oct%202021.pdf. This manual defines capability as the "ability to complete a task or execute a course of action under specified conditions and level of performance."

3. Jim Rainey and James Greer, "Land Warfare and the Air-Ground Littoral," *Army Aviation* 71, no. 12 (31 December 2023): 16, <u>https://reader.mediawiremobile.com/ArmyAviation/</u> <u>issues/208803/viewer?page=14</u>.

4. U.S. Army Futures Command, Army Applications Lab (unpublished white paper, 25 October 2023). The notion of a capability of record, including the iPod example, are described in this white paper.

5. To Receive Testimony on the Department of Defense's Posture for Supporting and Fostering Innovation Before the Senate Armed Services Committee Subcommittee on Emerging Threats and Capabilities on Accelerating Innovation for the Warfighter, 117th Cong. (6 April 2022) (statement of Michael Brown, Director, Defense Innovation Unit), 9, https://www.armed-services.senate.gov/download/ brown-statement-04/06/2022.

6. Whitney McNamara et al., *Commission on Defense Innovation Adoption Final Report* (report, Washington, DC: Atlantic Council, 16 January 2024), 7, <u>https://www. atlanticcouncil.org/in-depth-research-reports/report/</u> atlantic-council-commission-on-defense-innovation-adoption/.

7. Gary Anderson and Francisco Moris, "Federally Funded R&D Declines as a Share of GDP and Total R&D," National Center for Science and Engineering Statistics, 13 June 2023, <u>https://ncses.nsf.</u> gov/pubs/nsf23339/.

8. U.S. Army Futures Command, Army Applications Lab, 1-2.

9. "Wright Brothers, 1909-1910," National Museum of the U.S. Air Force, accessed 29 July 2024, <u>https://www.nationalmuseum.</u> <u>af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/197528/</u> wright-brothers-1909-1910/.

10. Christine Wormuth, "Secretary of the Army Opening Remarks at AUSA 2023" (remarks as prepared, Washington, DC: U.S. Army, 9 October 2023), <u>https://www.army.mil/</u> <u>article/270662</u>.

11. Ibid.

US ISSN 0026-4148