



Sgt. James Hyman, an operator for the 11th Cyber Battalion's Expeditionary Cyber-Electromagnetic Activities Team-01, collects information from two sensors—one from an unmanned aircraft system and another from a robotic dog named Spot—to conduct cyber effects operations during an operational readiness assessment for the battalion on 30 March 2023 at Schofield Barracks, Hawaii. (Photo by Steven Stover, 780th Military Intelligence Brigade [Cyber])

Data Literacy

How We Prepare for the Future

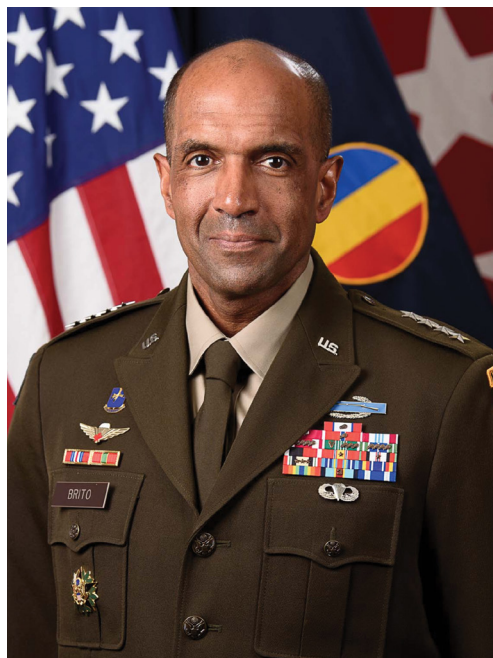
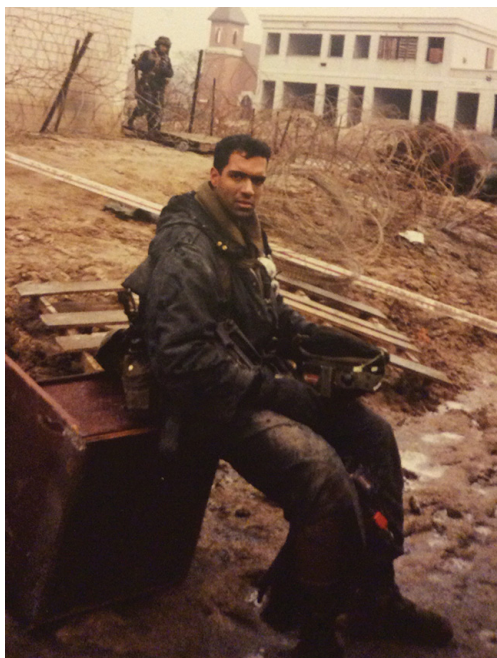
Gen. Gary M. Brito, U.S. Army

TRADOC is developing the Soldiers and Leaders of the Army's future formations today.

—TP 525-92, *Operational Environment 2024–2034*

The world has changed quite a bit since I was a platoon leader several decades ago. However, the need for warfighting readiness has not

changed, and one could argue it is even more relevant today. Space, cyber, and other domains have added complexity to our operations. Technology is evolving at an ever-increasing rate. The wide availability of emerging cheaper, disruptive technology has changed the threats we face. Our adversaries are also getting stronger, faster, and more lethal every day.¹ While many of the fundamentals of warfare remain unchanged throughout



Then—Lt. Gary Brito at Doughboy City, a mock Berlin village, in 1989. (Photo courtesy of author) Today, Gen. Gary Brito serves as the eighteenth commanding general of the U.S. Army Training and Doctrine Command. (Photo courtesy of the U.S. Army)

“ The world has changed quite a bit since I was a platoon leader several decades ago. ”

history, this is no time for business as usual. Essential to our Army’s ability to shoot, move, communicate, and do first aid on a modern battlefield are data-literate soldiers and leaders who can rapidly make sound decisions, bringing all available capabilities to bear, to close with and destroy the enemy on an increasingly transparent and evolving battlefield. Don’t misunderstand me—our Army must remain the lethal fighting force it has always been: fit, disciplined, and with a mastery of warfighting skills. However, the abundance of data is now a condition we must prepare for.

A lot of people are talking about the importance of data literacy these days, with many different thoughts on what data literacy is or how it is connected to digital literacy. In fact, data literacy is one of the most in-demand skills in the modern world.² Our doctrine defines data literacy as the ability to read, analyze, and communicate with data.³ Several academic institutions define data literacy similarly. This is not a completely new skill set, especially in the Army. There has always been a need to capture observations from

our environment and then process and analyze that data to create understanding and drive actions on the battlefield. Why is this important? In my view, access to large amounts of data is as relevant on the battlefield as in one’s household. It must be managed, filtered, and understood to be useful. Otherwise, it’s just clutter. The rapid rate of technological expansion and the explosion of digital systems providing us data underscores the need for data-literate soldiers.

With so much data available, it is a challenge to rapidly leverage our systems to get meaningful information that drives decisions. But as our Army transforms, this is an exciting opportunity to ensure we identify the skills our people—our number one advantage—need to fight and win. Meanwhile, our adversaries are also learning how to rapidly exploit massive amounts of data available from sensors that are ubiquitous across the modern battlefield.⁴ In an environment of excessive amounts of data, it is critical that our soldiers and leaders are data literate without compromising individual and collective proficiency;

we must prepare for the future fight while ensuring we are ready to fight tonight.

As our Army undergoes one of the largest transformations in many decades, we are conducting a modern-day version of the early 1940s Louisiana Maneuvers; experimenting and training with new kit, formations, and capabilities.⁵ Whether through C2 Fix, transformation in contact, or a variety of training venues ranging from warfighting exercises to training with allies, we are experimenting with new capabilities on a global scale and examining not just what new, exciting kit to field, but how best to employ our modern force at scale and in a variety of conditions.⁶ With an abundance of newer digital capabilities, we are experimenting with how to best shoot, move, and communicate in the current and future operational environment. Regardless of which new materiel we invest in, none of that is possible without soldiers and leaders who can leverage all the tools available to them with the mental agility, confidence, and understanding of the best way to dominate, fight, and win on any battlefield.

Data-literate soldiers who can read, analyze, and communicate with the data available to them can provide insights to leaders at all echelons. They can maintain agility and share useful information rapidly. This allows us to create shared understanding across formations and up and down echelons to drive effective, integrated action on a multidomain battlefield. Those who can effectively glean the most relevant observations at the point of need, using effective systems to rapidly sort all the data available to them, can more effectively bring the full force of modern capabilities to bear on a complex battlefield.

Operationalizing Data Literacy

As we transform to meet the demands of the current and future operational environment, there are no easy buttons to ensure we maintain overwhelming overmatch of our adversaries. We need the right people—trained well in their respective skill sets and comfortable with the skills of the modern, more digital world—who can employ emerging technology and capabilities, often integrated with other formations, to achieve lethal and influential effects on the battlefield. And because we don't send individuals to war, we send formations, we need our formations designed and organized so that commanders at echelon are enabled

and positioned to best synchronize effects on a multi-domain battlefield.

Our observations of current conflicts and experimentation with robotics and human-machine integration show that the formations of our future force will contain a blend of humans and autonomous systems.⁷ We also know the future battlefield will be highly congested and contested along the electromagnetic spectrum, which isn't visible to the naked eye but can impact how machines and digital systems operate.⁸ As communication systems are disrupted, this environment makes mission command and trust up and down the chain of command more important than ever. It also showcases the need for soldiers at every echelon to think critically about the data their systems provide and understand how to read, analyze, and communicate that data appropriately.

Picture a battlefield full of sensors, both human and machine. This changes the way we target, respond to commander's critical information requirements, and help leaders make timely, informed decisions to ensure mission success on the battlefield.⁹ If commanders and their soldiers do not understand how to interact with data available in their environment or do not understand how to ask relevant questions to receive actionable information from the data, the ubiquitous sensors will provide a flood of data but less meaningful information. Digital systems do not intuitively know what a commander is looking for, nor how to group data points from observations into meaningful information. They will deliver exactly the information they are programmed to provide. Machines require a human in the loop, a data-literate soldier or leader to complete the picture.

Mission command, the Army's approach

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Sgt. Tyler Tressler, a squad leader assigned to Alpha Company, 1st Battalion, 29th Infantry Regiment, holds his position during the final exercise of the 10X Dismounted Infantry Platoon Project at Fort Moore, Georgia, on 20 September 2024. 10X, led by the U.S. Army DEVCOM Ground Vehicle Systems Center in partnership with Fort Moore's Robotics Requirements Division, the Maneuver Battle Lab, and the National Advanced Mobility Consortium, is designed to use a robotic system of systems integrated with an infantry platoon to enhance maneuver, situational awareness, and operational effectiveness. (Photo by Chris Estrada, U.S. Army)

to command and control that empowers subordinate decision-making and decentralized execution, is central to our culture.¹⁰ On a future contested and congested battlefield, this approach in which trust and exercised discipline are paramount is even more critical to success on the battlefield. Commanders must understand how to organize their people and establish human systems and processes enhanced with digital tools to provide rapid, relevant information. Soldiers must think critically about the data and information they receive and be purposeful in their communication. Improper use or misunderstanding of data can lead to poor decision-making or worse yet—costs lives. That does not mean we should fear digital systems or new technology, but we should not take them for granted either. After all, none of our materiel capabilities work without our soldiers and leaders driving them.

Institutionalizing Data Literacy

We don't expect every soldier or civilian in our Army to be a data scientist. As mentioned previously, we need the right people armed with basic skills that can take the latest emerging technology and employ it to achieve impactful effects. We need our soldiers and leaders to do physical training; qualify on their assigned weapons; perform first aid; and read, analyze, and communicate data appropriate for their respective roles and positions. Our Army is dedicated to developing its people, and the U.S. Army Training and Doctrine Command (TRADOC) sets our Army's training standards for those skills.¹¹

Data literacy, like any skill, is developed over time through repetitive, progressive training and reinforcement of those skills in operational settings. Currently, TRADOC is targeting leader education to increase

its basic data literacy across the force while also maintaining availability of courses for people who want to expand their data literacy skills.¹² We are also working to build grade-appropriate data literacy instruction across the continuum of development, from initial military training through the highest levels of professional military education. Through partnership with the operational force, soldiers' data-literacy skills continue to build throughout their careers as they apply them to real-world situations and in collective training scenarios with their units. The private first class in basic combat training today will attend the Basic Leader Course in a few years. The lieutenant attending the Basic Officer Leader Course today will attend the Captains Career Course four-to-five years from now. The point: a continuum of learning between brick-and-mortar institutional training and home station (unit of assignment) training is critical to keep data literacy at the forefront.

At echelons above brigade, the Army is also learning through experimentation and unit training that

we may need a select few who are data integrators and analysts to enable decision-making. The solution may not be a "one-size-fits-all" approach, but we are working to provide a baseline organizational structure that units can customize to their environment. This is very much a team effort among TRADOC, Army Futures Command, and the operational units.

Technology is evolving at an ever-increasing rate—the world might never have seen the intersection of so many new technologies—and our adversaries are growing stronger and getting bolder. This requires mentally agile leaders who can quickly adapt to a rapidly changing operational environment. A data-literate force will be better prepared to best understand and operate in the current and future operational environment and leverage the full capability of the tools in their toolkit. Most simply stated, as an Army, we must be able to shoot, move, communicate, and sustain ourselves with all available tools and capabilities regardless of how our operational environment evolves. ■

Notes

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