FALL 2023

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THE COMMANDER'S ROLE IN AUDIT READINESS

DATA-DRIVEN SUSTAINMENT

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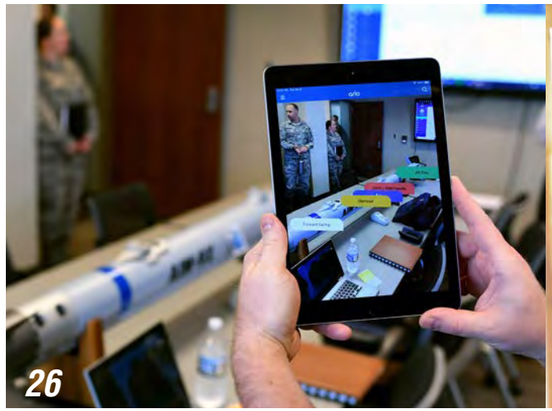
IN THIS ISSUE



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ON THE COVER

The Fall 2023 Army Sustainment Professional Bulletin focuses on Data-Driven Sustainment. Instructor Chief Warrant Officer 3 Mervin Terre from the Army Sustainment University gives a presentation on the Army's Mobile Asset Tracker-Automated Parachute Management system to a class of Airdrop Systems Technicians during their Warrant Officer Basic course at Fort Gregg-Adams, Virginia, Aug. 22, 2023. (Photo by Amy Perry)

This medium is approved for the official dissemination of material designed to keep individuals within the Army knowledgeable of current and emerging developments within their areas of expertise for the purpose of enhancing their professional development.

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Amy N. Perry, Oct. 1, 2023

Advancing the Sustainment Enterprise to Data-Driven Logistics Operations

■ *By Gen. Charles R. Hamilton*

In today's complex and rapidly changing operational environment, Army sustainment efforts must continue adapting at speed and scale to deliver ready combat power to the joint force on a multidomain battlefield. The Army sustainment enterprise is initiating and expanding capabilities to leverage data analytics and advanced technologies to accomplish this. Data-driven sustainment operations are not only the way of the future; it is how the Army must operate today to enhance its ability to anticipate and address logistics needs efficiently across the spectrum of conflict to sustain an expeditionary global force.

As one of six objectives Secretary of the Army Christine Wormuth shared in her message to the force on Feb. 8, 2022, the intent is "to ensure the Army becomes more data-centric and can conduct operations in contested environments, which will enable our ability to prevail on the future battlefield." By harnessing the power of data analytics, the Army can synthesize vast amounts of information to gain valuable insights, identify trends, and predict future requirements — at the speed of combat. It must employ predictive logistics for executing precision sustainment capabilities worldwide, allowing for greater control, visibility, and efficiency.

Predictive logistics requires the leveraging of historical data, advanced analytics, and machine learning algorithms to accurately forecast demand for supplies, equipment, and maintenance needs and to optimize transportation and distribution networks. By integrating data from various sources, such as equipment usage, maintenance records, deployment schedules, and weather patterns, sustainers can make informed decisions, proactively identify and address potential supply chain disruptions, allocate resources accordingly, and mitigate risks. This approach helps avoid costly delays, minimize downtime, and maximize operational capabilities. From anticipating demand and optimizing inventory management to improving current and future maintenance practices, predictive logistics ensures troops receive the necessary parts, supplies, and equipment in time when and where needed.

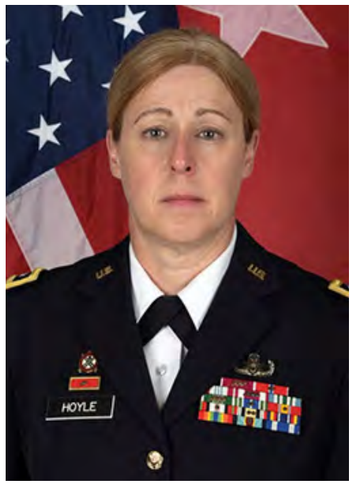
Predictive sustainment at the tactical level enables precision logistics at the operational and strategic levels, enabling leaders to make better-informed decisions and improve overall readiness. But data is only as good as the ability to collect, analyze, and understand how to action it. To fully exploit the power of data-driven sustainment, we must invest in the necessary infrastructure, technology, and training for Soldiers and, where possible, integrate with partners and allies. This requires a collective effort from all stakeholders, including Army leadership, the acquisition community, industry partners, joint and multinational partners, and Soldiers on the ground. We must develop robust data collection systems and ensure interoperability and sharing across different systems and platforms. Additionally, we must prioritize the development of data analytics capabilities and provide comprehensive training to personnel, equipping them with the skills and knowledge necessary to analyze and interpret data effectively.

Data-enabled decisions will decide future battles. The right data at the right time and at the right place enables faster and better decisions at echelon and allows for out-thinking and out-pacing any adversary. The Army is aligning itself as a data-centric organization, and so must its sustainment formations and leaders.

Gen. Charles R. Hamilton currently serves as the commanding general of Army Materiel Command. In February 1988, he graduated from Officer Candidate School as a Distinguished Military Graduate and was commissioned as a second lieutenant in the Quartermaster Corps. He earned a master's degree in public administration from Central Michigan University and a master's degree in military studies from Marine Corps University. He also graduated from a Senior Service College Fellowship — Secretary of Defense Corporate Fellows Program.

Data-Centric Sustainment Will Turn Past Challenges into Future Opportunities

for the Total Army and Joint Force



■ *By Maj. Gen. Heidi J. Hoyle*

Last spring, the Honorable Christine E. Wormuth, the 25th Secretary of the Army (SECARMY), asserted to the Senate Committee on Armed Services that "Data is as important as ammunition on the future battlefield" during her statement on the posture of the United States Army. Data centricity has been a top priority of Wormuth's since she took the helm as SECARMY in May of 2021, as operational success within and across contested environments will be greatly bolstered by the ability to access, analyze, and communicate insights derived from high-quality data at all echelons. Becoming a holistically data-centric organization is not just an abstract goal that's nice to have. Rather, it is a must-have that has gained substantial momentum as the Army advances its end-to-end data infrastructure to meet the demands of a highly contested strategic, operational, and tactical environment.

Transforming the methods by which gargantuan amounts of data are collected, stored, analyzed, and displayed has progressed through a series of critical inflection points and phases. Many reading this will remember using the Standard Army Management Information System, or STAMIS, in the 1980s, 1990s, and 2000s as representative of this first phase. Featuring more than 1,000 legacy logistics systems, each managing an isolated segment of sustainment, STAMIS was inherently stove-piped in how it attempted to drive warfighter support from fort to foxhole. As the internet developed and matured, STAMIS migrated to being web-based. However, this transfer failed to exhaustively integrate those pre-existing stove pipes into a fully unified system that generated the appropriate data for analysis and decision support.

The second phase is broadly defined by investments made in commercial-off-the-shelf enterprise resource planning (ERP) solutions from the 2010s onward, with an initial focus on connecting each of those ERPs within the Single Army Logistics Enterprise. The focus has since changed to leverage rapid advancements in cloud computing, where the aim is to migrate these ERPs and external solutions to connect data in existing analytics platforms, such as Army Vantage. Doing so enables rapid, authoritative, data-driven decision-making for commanders wherever they operate as the basis of the third phase, marked primarily by efforts related to Enterprise Business Systems - Convergence (EBS-C), ensuring the Army's business systems are postured to drive readiness for a multidomain operations-capable force. In a broad sense, this helps turn insight into action by delivering an analytical capability precisely at the point of decision.

Chartered in March 2020 by the Under Secretary of the Army, EBS-C will deliver a modernized capability integrating sustainment operations from the strategic support area to the tactical space from existing ERPs, such as Global Combat Support System-Army and the Army Enterprise Systems Integration Program. This cloud-based system will help the Army commoditize its data as the foundation of analysis performed to inform all decision-making exhaustively and systematically. The single, unified end-to-end architecture optimizes information management and provides logisticians the capabilities needed to execute their wide-ranging sustainment missions within increasingly complex operational environments.

Perhaps the most salient example of what converging once disparate systems will afford relates to EBS-C's enablement of predictive logistics (PL) and vice versa. To derive valid predictive and prescriptive insight from any suite of machine learning algorithms, the underlying logistics data feeding those algorithms must be properly stored and integrated. Put more bluntly, if you provide bad data, you receive bad outputs. Through the application of sensors and other collection methods part and parcel to PL, usage, inventory, and other logistics data fed into a converged system will be delivered in a fashion that is easier to store and integrate. Advancing EBS-C and PL in the near and medium term does not revolve solely around system upgrades that are treated as a panacea for past challenges. There is, of course, a workforce development aspect central to the Army's broader approach to data-centricity. To use data appropriately, training and education are needed. You can learn more about how the Army sustainment enterprise is modernizing its training and education to improve data literacy and analytical capabilities in the Fall 2023 edition of *Army Sustainment*. Additionally, this edition features a deeper dive into EBS-C and its supporting framework as part of an interview with three of the Army's foremost leaders on all things data centricity: Brig. Gen. Michael Lalor, the commanding general of Tank-automotive and Armaments Command and the former director of the EBS multifunctional capabilities team; and Jen Swanson, the deputy assistant secretary of the Army for data, engineering, and software; and Ross Guckert, the program executive officer for enterprise information systems.

Answering Wormuth's call for data centricity across the sustainment warfighting function will improve readiness by enhancing existing logistics processes tailored to the needs of an Army executing large-scale combat operations across all domains. From materiel readiness to supply forecast accuracy to audit compliance, integrated data is foundational to all aspects of the sustainer's role. As the Army prepares for a future operational environment that places a premium on the ability to aggregate and disaggregate forces in austere points of need, data infrastructure must transform in lockstep to ensure predictability and precision in all delivered sustainment support. Doing so will enable resilient data pipelines across echelons and allow commanders to see, understand, decide, and act by ensuring insight derived from that data is available where it is most needed — the tactical edge. Becoming the data-centric sustainment workforce the Total Army and joint force need is a continuous process, but it is one in which the Army has built uninterrupted momentum in the drive to deliver the Army of 2030 and design the Army of 2040 and beyond.

Maj. Gen. Heidi J. Hoyle currently serves as the Headquarters, Department of the Army acting deputy chief of staff, G-4. A graduate of the U.S. Military Academy, she has a Master of Science in systems engineering from the University of Virginia and a Master of Science in national resource strategy from the National Defense University. She is a graduate of the Chemical Officer Basic Course, Combined Logistics Officer Advanced Course, United States Army Command and General Staff College, and the Eisenhower School of National Security and Resource Strategy.

Predictive Logistics in Data-Driven Sustainment

■ *By Maj. Gen. Mark T. Simerly*

As the Army looks ahead to 2030, it is building a more data-centric, data-cultured, and data-dependent Army. Data superiority requires skilled data leaders and effective data systems focusing on predictive logistics. The lethality and complexity of large-scale combat operations (LSCO) will disrupt sustainment in every domain and level of war. Data is the most decisive commodity for improved sustainment on the contested logistics battlefield. LSCO requires a significant transformation of the Army's sustainment capability, which is the Army's largest producer and consumer of data. As it modernizes sustainment systems to ensure freedom of action, extended operational reach, and prolonged endurance, it must leverage data as a commodity to achieve decision dominance.

Over the last ten years, the Army has generated powerful momentum toward transforming the Army into a more modernized force. Last fall, the Army released the updated Field Manual 3-0, Operations, which focuses on LSCO and multidomain operations (MDO), the combined arms employment of joint and Army capabilities to create and exploit relative advantage to achieve objectives, defeat enemy forces, and consolidate gains on behalf of joint force commanders.

Sustaining LSCO requires rapid, precise, and effective data analysis to anticipate requirements and make better decisions faster than U.S. adversaries. LSCO operations produce greater sustainment demands due to higher op-tempo, greater lethality, and significantly increased consumption of supplies and equipment.

In contested, denied, and disconnected environments, joint forces must be able to shoot, move, communicate, and win despite time, speed, and distance challenges. The Army works diligently to ensure its leaders anticipate requirements and make effective decisions within these operating environments. Sustainment transformation efforts focus on better systems, better equipment, and better training to support decision dominance in a changing environment where data is leveraged against its adversaries.

Skilled Data Leaders

The operating environment of 2030 requires sustainers who can read, write, and communicate data in context to provide leaders with better options sooner. To ensure the Army has skilled data leaders and Soldiers, professional military education (PME) and training are becoming more data-centric. Providing sustainment leaders with competence in analytical and technical skills, Army Sustainment University (ASU) implements a data education program that embeds data education within PME throughout the careers of sustainment leaders. ASU's data education program includes math and computer skills, including statistics, forecasting, data analytics, and data visualization using business intelligence, macros, and spreadsheet formulas. Data education develops sustainment leaders who can understand data and innovate at the tactical edge.

Data Capabilities

The Army requires modernized data capabilities, including information systems that provide relevant, integrated, and accurate data, enabling commanders to make decisions faster. The Army must aggregate data to allow commanders to leverage the data at echelon. Data systems must offer rapid availability of real-time data to mitigate time, distance, and speed risks. This gives commanders the ability to be responsive and execute across contested environments.

The Army is undergoing a modernization of its Enterprise Business Systems (EBS) to improve its ability to manage data at echelon. The Army's existing EBS consists of tools that must also be part of the future suite of solutions to data collection needs. EBS - Convergence is the Army's business modernization and transformation effort to simplify, streamline, standardize, and unify business operations to a common platform that will effectively and efficiently enable MDO. This program seeks to produce a single system to support the Army at rest and the Army in motion decisions, deployments, redeployments, and in-theater sustainment and distribution.

Predictive Logistics

Army sustainment's priority system effort is predictive logistics. It will provide commanders at echelon with real-time situational awareness of their current and future logistics readiness. It will enable sustainment support and services before the need or demand signals in these contested, denied, and disconnected environments.

Predictive logistics is a suite of solutions that harnesses the power of data for Army sustainment. Predictive logistics helps achieve all four of the tenets of MDO: agility,

In contested, denied, and disconnected environments, joint forces must be able to shoot, move, communicate, and win despite time, speed, and distance challenges.

convergence, endurance, and depth. It also allows for the opportunity to create and exploit relative physical, information, and human advantages in pursuit of decision dominance to sustain the main effort and understand and manage the effects of operations on units and Soldiers.

To meet the challenges of a continuously evolving global stage, joint forces must nest modernized sustainment across the services. Modernization must allow for transitions between services, industry, and domain. As the demand for equipment, fuel, and maintainers increases, so does the demand for resources. Data-enabled capabilities offer the ability to synchronize and distribute those logistics to the multidomain force with precision.

Predictive logistics focuses on data collection, storage, transportation, analysis, and visualization. This predictive logistics data will improve the timeliness and accuracy of logistics data. Without this accuracy, all upstream artificial intelligence and machine learning (AI/ML) efforts will produce flawed results for decision support. However, accurate data and analysis, along with advanced decision support tools, effectively sustain and increase combat power at all echelons.

Sustainers and operators need the tools to make the correct data-driven decisions, while commanders need the ability to visualize the capabilities of both the Army and coalition's combat power. With predictive logistics, weapon system readiness information and the status of relevant maintenance and supply processes are fused and fed to the commander's running estimate, enhanced with decision support tools. With predictive logistics, commanders at all echelons understand the immediate and future status of their formations' combat power.

Predictive logistics significantly increases the availability of data, the amount of which exceeds human cognition and requires AI/ML to fully leverage the data at the speed of decision. AI/ML decision support tools expedite a commander's ability to make decisions.

The more data collected and analyzed, the better AI/ML tools will be at forecasting requirements and optimizing distribution and production at the national level. In the maintenance arena, refinements will improve predictive capabilities and reduce unplanned failures as much as the collected data would make possible.

Way Ahead

The Army sustainment community will continue integrating with industry and academia on many current platform programs, including Aircraft Notebook, Stryker Tablet, Digital Logbook, and DataRobot. There are currently dozens of other analytics tools under development with predictive logistics. An example of an innovative technological approach is an aviation maintenance optimization tool developed by the Army's AI center at Carnegie Mellon University, Pennsylvania.

The advantage offered by these data-enabled systems ensures the sustainment enterprise is postured to sustain victory despite the contested environment. To achieve success, the Army must align data education, operational requirements, and sustainment functions while modernizing training, weapons systems, and the ability to predict the future force of readiness.

In a multidomain battlefield, the Army must develop the connection of support functions and tasks at the national and theater strategic levels in a contested multidomain operational environment that challenges the execution of sustainment over distance. Thus, data analytics must continue to evolve with no end state in mind. This will make collaboration between the joint forces critical and make everyone more ready and resilient. Through 2030 and beyond, the Army will make continuous improvements to get data and data analysis into the hands of warfighters at every level.

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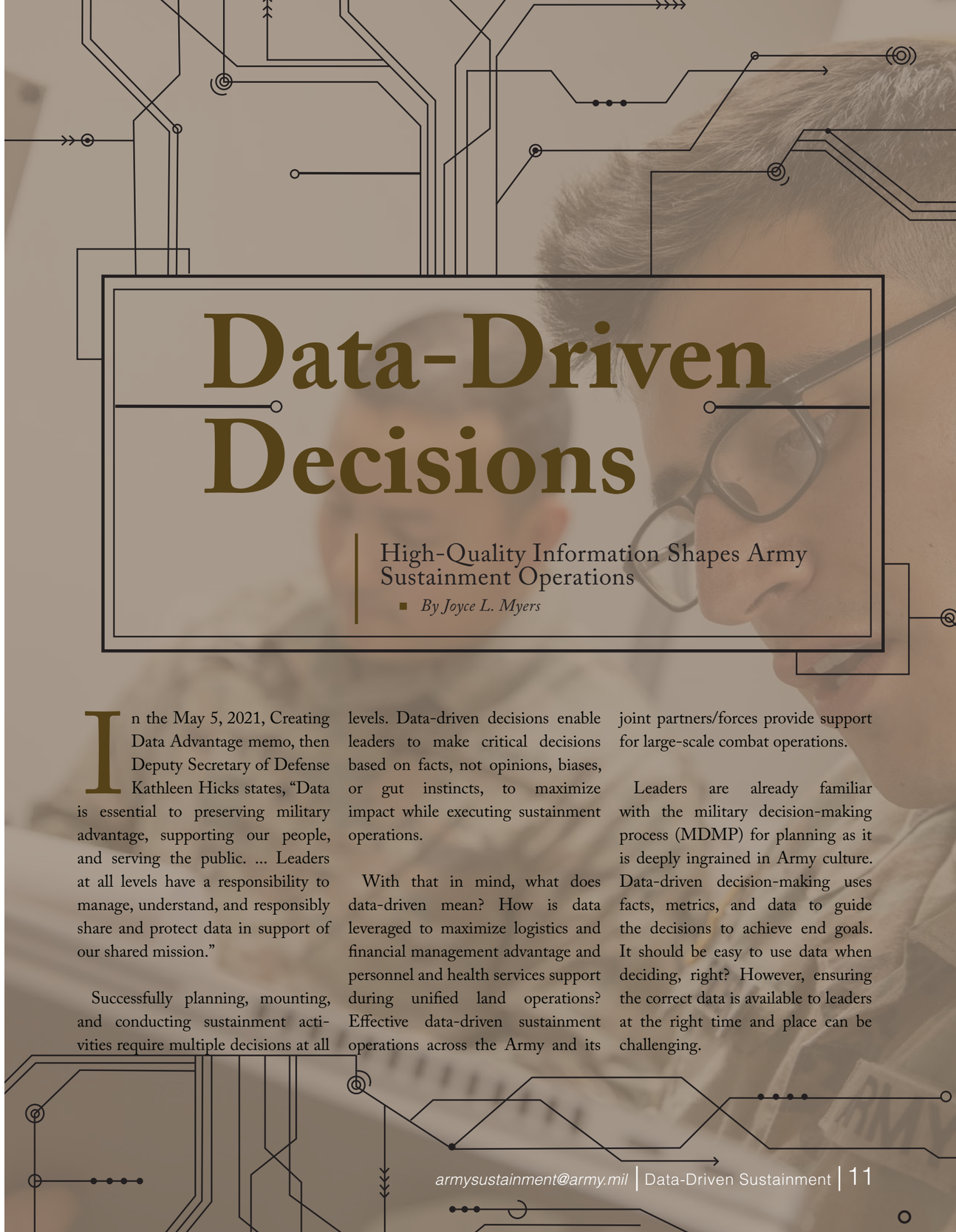


Data-Driven Decisions

High-Quality Information Shapes Army Sustainment Operations

■ *By Joyce L. Myers*

In the May 5, 2021, Creating Data Advantage memo, then Deputy Secretary of Defense Kathleen Hicks states, "Data is essential to preserving military advantage, supporting our people, and serving the public. ... Leaders at all levels have a responsibility to manage, understand, and responsibly share and protect data in support of our shared mission."

Successfully planning, mounting, and conducting sustainment activities require multiple decisions at all levels. Data-driven decisions enable leaders to make critical decisions based on facts, not opinions, biases, or gut instincts, to maximize impact while executing sustainment operations.

With that in mind, what does data-driven mean? How is data leveraged to maximize logistics and financial management advantage and personnel and health services support during unified land operations? Effective data-driven sustainment operations across the Army and its joint partners/forces provide support for large-scale combat operations.

Leaders are already familiar with the military decision-making process (MDMP) for planning as it is deeply ingrained in Army culture. Data-driven decision-making uses facts, metrics, and data to guide the decisions to achieve end goals. It should be easy to use data when deciding, right? However, ensuring the correct data is available to leaders at the right time and place can be challenging.

While conducting mission analysis, have you ever felt frustrated that you couldn't find the data you needed to make a decision? Or you found the data, but it didn't make sense and was incomplete. Or you didn't have the necessary supporting data to move from analysis to an informed decision. Have you had to search across multiple systems, each with access restrictions and confusing parameters, ultimately prolonging or ending your research?

Data is Receiving Support from the Top Down

The DOD and the specific military services have recognized these issues and the impact on the ability to use data in the MDMP and the effect of data on day-to-day sustainment operations. As a result, the DOD has created specific data-related goals and plans, ensuring the services improve their ability to make data more available at all echelons. When organizations understand and maximize the value of their data, then everyone is empowered to make the best decisions using data.

Per the DOD Data Strategy of 2020, data must be visible, accessible, understandable, linked, trustworthy, interoperable, and secure. In response to the DOD Data Strategy, the Army developed an Army Data Plan, which addresses how it will achieve the DOD data goals through strategic objectives and efforts.

Additionally, understanding the Army often operates in a fiscally constrained environment, to reach the data-related goals and objectives, it must transform and modernize the way it does business and how it uses data to drive that business. The Army Digital Transformation Strategy of Oct. 12, 2021, recognizes that the Army must share data and information seamlessly, providing timely insights to the warfighter, commands, and the enterprise to influence Army readiness and modernization positively.

The Army also recognizes it has, over time, created siloes of data and information across different business mission area domains. For example, the logistics and finance domains have several enterprise resource planning (ERP) systems, such as the Logistics Modernization Program, Global Combat Support System–Army, Global Fund Enterprise Business System (GFEBS), GFEBS-Sensitive Activities, and the Army Enterprise Systems Integration Program Hub, plus hundreds of other non-ERP systems.

Through automated business processes, these Army sustainment systems provide the necessary data and information to conduct the activities required to perform sustainment operations. Sustainment leaders use this data and information to make informed decisions.

The Future of Army Data-Driven Sustainment

While logistics and finance are not the only business domains considered when making decisions for sustainment operations, they are the largest and most impactful domains. One critical line of effort within the Army Digital Transformation Strategy is to converge and modernize Enterprise Business Systems, the aim being "a sustainment warfighting function that is a competitive advantage, fostering dominance in MDO (multi-domain operations) with enabling technology and business processes." As a result, the Army's Enterprise Business Systems-Convergence (EBS-C) project is one of the Army's largest modernization efforts. The goal is to provide the warfighter with the most modern capabilities to execute sustainment and financial management operations.

Why should understanding where the Army is going related to data goals and objectives matter to you? Data, on its own, is just facts. When combined, data creates information, which helps make informed decisions.

As units plan for sustainment operations, decisions are required. What are the questions you need answered? What is the best available data to answer those questions? Does your organization have the skills necessary to understand and analyze the data? Do you know how to integrate and apply the data without adding personal bias?

The Army Data Plan, Strategic Objective 1, Operationalized Data-Driven Decisions that Support Multi-Domain Operations at Echelon, states the goal is "to avoid having our Soldiers either waste time finding the right data for decision or make decisions without the appropriate information. The desired outcome is that at all echelons, the Army leverages authoritative data and improves its ability to identify, access, process, analyze, comprehend, and use information to improve decision-making while decreasing the workload."

Examining this goal and focusing on the desired improvements — the ability to identify, process, analyze, comprehend, and use information to improve decision-making while decreasing the workload — it is critical to be data literate at all echelons of the Army.

Data literate means reading, writing, creating, understanding, and communicating with data in context. Every decision, whether it be during sustainment operations or when making a personal purchase online, is impacted by data. Making data-driven decisions is one aspect; trusting those decisions is another.

What Does This Mean for You and Me?

Soldiers and civilians create data in their day-to-day jobs. That data is collected and, together with other data, creates the information they and their leaders use to make decisions. Understanding that data matters from the moment it is created until it is used for decisions helps to appreciate better and influence the importance of data quality as business is conducted in automated sustainment systems.

For example, each day, all over the Army, Soldiers conduct maintenance on Army equipment. As they complete each maintenance activity, the associated data should be entered into the automated systems to provide the overall picture of the maintenance status for that piece of equipment. If data is inaccurate or missing, its widespread effects appear when aggregated across the entire Army footprint.

As data flows through the systems to different echelons, it is captured, aggregated, and integrated with other data and starts telling a story. But the story is incomplete. Those missing or inaccurate pieces of data will eventually influence the decisions being made.

For example, a battalion's leadership feels they do not have enough maintainers to handle their workload in the motor pool. However, in this scenario, the reported data incorrectly shows maintenance activities are easily and quickly completed with the personnel on hand. This gap in accurate data has ripple effects up the chain. If the data were accurate, showing Soldiers over-burdened at current manning levels, the decision makers would see that more time is required to complete these jobs than expected. If more time is required, perhaps more mechanics are needed, ultimately making accurate data entry into needed support.

Not all decisions made from this data may be immediately seen or felt. It may take time. If the data indicates fewer mechanics, the following approved authorization document may reflect that lower number. The maintainer entering the data may have moved on and not even see the long-term impact on the organization.

Regardless of their level in the sustainment process, everyone is responsible for providing the best possible data and information about business processes and activities. In addition to personal responsibility for the data entered into Army systems, leaders have an inherent responsibility to ensure Soldiers and civilians understand the importance and value of data and its positive and negative impacts on Army sustainment.

Becoming data literate as an individual and proactively creating opportunities that allow Soldiers and civilians to read, write, create, understand, and communicate with data will be the force multiplier that amplifies data-driven sustainment.

Joyce L. Myers retired from federal service as Chief Data and Analytics Officer for the U.S. Army Aviation and Missile Command (AMCOM). She also served as the AMCOM Secretary of the General Staff. She served in the Army on active duty in the logistics field with various military assignments. She became a Department of the Army Civilian, where she led numerous Army logistics and data-related teams. She is currently the Chapter Lead for the Huntsville Women in Data Chapter.

Feature Photo
Spc. Jessy Becerra, a medical logistics specialist assigned to the 325th Field Hospital, Independence, Missouri, shouts out the serial number of a computer to Army Reserve Spc. Kevin Ramirez, a medical logistics specialist assigned to the 7457th Medical Operational Readiness Unit, Richmond, Virginia, during the National Capital Region Low-Density Medical Skills Sustainment Training at the Walter Reed Army Institute of Research in Silver Spring, Maryland, Aug. 9, 2023. (Photo by Staff Sgt. Christopher Hernandez)

Effective Collecting, Analyzing, Using Data Critical for Success on the Battlefield

By Chief Warrant Officer 4 Jason Andrew Joseph Celestino Sr.

Over the past few decades, businesses, governments, and militaries worldwide have relied heavily on data analytics to advance operations, gain critical insight for tactical advantages, and improve decision-making processes. More specifically, the Army has quickly realized that the ability to empower data analytics for its leaders gives it a distinct opportunity to move into a more data-centric organization, setting it apart from its adversaries. In doing so, it significantly emphasizes developing the training necessary for its formations.

Data analytics and analysis itself is not a new concept. It can be seen throughout history. Whether in the building of the great pyramids, the study of the universe, or today's Army decision-making process, it all involves data analysis. However, how you gather, process, store, and analyze data has changed throughout the centuries and even more so in the past few decades. Primitive data collection methods and basic statistical analyses have become obsolete, replaced by the advent of advanced technologies and sophisticated algorithms. With these advancements come larger and cheaper storage, faster processing, and more advanced analytical tools, but these advancements also require more skill sets if the Army is to embrace its data-centric approach fully.

To take advantage of these advancements, ask, "What's the big data?" Big data refers to data that is too large or complex, grows, or changes at such a high velocity that traditional methods can no longer analyze it. All major businesses and corporations suffer from big data issues, and the Army is no exception. This is why leaders at all levels must understand data, data collection, data analysis, and what it means to the future of the Army.

How does data analytics solve this issue, and why train leaders? To answer those questions, the concept of data analytics itself must be broken down. Think of data like a box of building blocks dumped onto the floor. All the different pieces are pulled from the different bags into one big pile. Those bags represent the Army enterprise resource planning (ERP) systems. All the blocks' different colors, sizes, and shapes represent the raw data extracted from the ERP systems in various forms. The data would then have to be sorted by placing all the colors of the pile together. Once sorted, the pieces must be arranged to make them more easily identifiable. This is done by gathering all like pieces together within the colored piles. After sorting and arranging all the pieces, the data can be presented visually. One way of completing this would be by stacking all liked colors and pieces neatly together. The final step is telling a story and providing context to the data.

Giving leaders at all levels the understanding and tools necessary to navigate the data-centric environment allows for a more effective decision-making process. By collecting, analyzing, and interpreting vast amounts of data, Army leaders can identify patterns, trends, and potential threats, enabling them to make more fact-based decisions. Data analytics also allows commanders to leverage real-time information on the status of vehicles and weapons, weather conditions, enemy movement, and many other elements within battlefield dynamics.

Predictive analytics is also a key component of having data-driven leaders. Using advanced analytical methods to analyze historical sustainment trends more efficiently at the lowest levels provides significant advantages for future planning. Sustainment leaders can combine various sources such as the Global Combat Support System–Army, the Army Enterprise Systems Integration Program, the Integrated Personnel and Pay System–Army (IPPS-A), social media, or open source information to develop predictive models for future operations. This helps leaders better prepare their formations for any scenario.

Data analytics can assist the Army in optimizing the allocation of limited resources. By giving leaders the proper tools, they can identify areas where resources are underutilized or overextended, such as bench and shop stock. This knowledge enables managers to allocate resources more efficiently, ensuring they are deployed where they are most needed. From personnel allocation to strategic asset management, data-driven insights help leaders make more informed decisions, maximizing the effectiveness of available resources.

By collecting, analyzing, and interpreting vast amounts of data, Army leaders can identify patterns, trends, and potential threats, enabling them to make more fact-based decisions.

Take IPPS-A, for example. This massive database gives the ability to manage personnel more efficiently. The data from IPPS-A and other databases can be employed to assess Soldiers' skills, training records, and performance evaluations. By analyzing this data, the Army can identify gaps in certain areas and allocate resources for targeted training programs to enhance Soldiers' capabilities, with data analytics being a prime example.

Additionally, in strategic asset management, data analytics can be used to track and analyze the performance and utilization of military equipment and vehicles. By monitoring data such as fuel consumption, maintenance records, or deployment history, the Army can optimize the allocation of assets, ensure proper maintenance, and extend its life cycle.

These are but a few advantages that can be leveraged by developing more data-literate leaders. The Army's emphasis on becoming more data-centric has engaged leaders at all levels to reevaluate how it trains within an ever-evolving, data-driven space. Still, it must start at the lowest levels. All leaders within the officer, warrant officer, and noncommissioned officer cohorts must develop valuable training for their formations if the Army is to be successful and take full advantage of the tools at its disposal.

Take the Army Sustainment University's Technical Logistics College (TLC), for example. The TLC trains six military occupational specialties among the ordnance warrant officer advanced courses on 80 hours of data analytics. This program started as a 40-hour block of instruction and has since moved to 80 hours, broken down into three programs (MS Excel, Access, Power BI) and a group project. Having had the distinct privilege of instructing this course over the past two years, here are a few lessons learned.

Humans shy away from intimidating things that are too difficult to understand, so starting with the basics to train leaders earlier in their careers is essential. Therefore, it is important to simplify the introduction to these programs. This simplification sets the foundation for the students, who often need more knowledge of even the most basic data analytical tools. Applying this approach increases their confidence within the programs and helps encourage their continued learning of the programs beyond the classroom walls.

Don't teach the shortcuts first. Shortcuts are invaluable time-saving tools within every analyst's toolbox, but they don't teach a beginner the why behind what is happening. If students are taught the theory of operations behind the various analytical methods, then the shortcuts begin to make sense. This also assists in applying troubleshooting techniques when a shortcut does not work. Students can more quickly identify the fault and take corrective measures, ensuring their product remains fully mission capable.

Sometimes, it's best to leave the digital age behind when explaining. While that contradicts everything discussed so far, when the operation is related to its simplest form, the concept is grasped more quickly. For example, if you are working on referencing data between three different reports, ask the students to imagine those reports as hard copies presented before them. Ask them to explain how they would manually analyze the data. Their step-by-step explanation can directly relate to operations taking place within the program. They may have to put on their thinking caps, but it works.

Make the training relevant to those taking the course. It is hard enough to learn a new way of processing data and even harder when using data irrelevant to someone's daily activities. Demonstrating actual functionality and how it relates to the individual keeps them engaged, helps them visualize real-world use, and validates the advantages of the tools being taught.

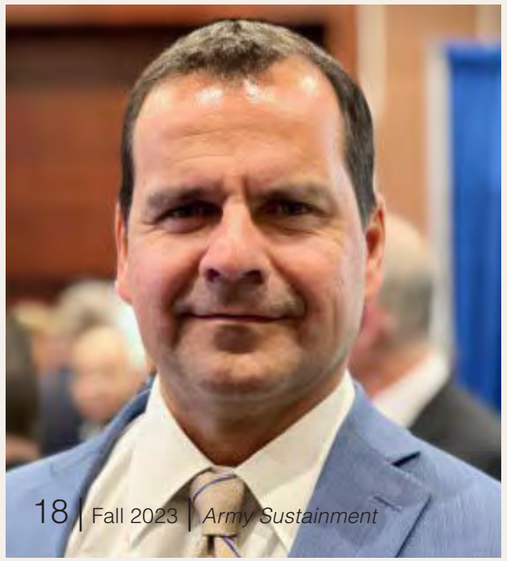
Lastly, encourage the idea that the more time spent on the front end creating a product, the more time there is on the back end to focus on other projects and, more importantly, family. The whole point of advanced data analytic methods is to analyze massive amounts of data more quickly and accurately. It may take months to create a product, but the effectiveness of that product and the time it saves will be worth it.

As the Army moves into the future, effectively collecting, analyzing, and utilizing data will be critical for its success on and off the battlefield. The advancements in technologies, data creation, and the Army's shift to becoming a more data-centric military will only accelerate. Embracing these facts and understanding the importance of data analytics will enable leaders to be more adaptive and effective in an increasingly complex and interconnected world.

Chief Warrant Officer 4 Jason Andrew Joseph Celestino Sr. has recently served as the site lead of the Armament Systems and Data Analytics departments and an instructor for the Technical Logistics College at Army Sustainment University, Fort Gregg-Adams, Virginia. He has a master's in advanced business analytics from the University of South Carolina.

Agile, Unified, and Modernized:

Transforming the Sustainer's Approach to Data-Centric Decision-Making



An Interview with Brig. Gen. Michael Lalor, Jen Swanson, and Ross Guckert

■ *By Mike Crozier*

The future potential for large-scale conflict against a near-peer adversary across multiple domains has placed a quiet premium on the Army and joint force's ability to modernize its end-to-end business operations. While the lion's share of external attention in the realm of modernization is steadily focused on weapon systems, the Army's advancement of Enterprise Business Systems - Convergence (EBS-C), its business modernization and transformation effort, will play a pivotal role in the service's success. In its end-state, EBS-C will integrate the Army's existing finance and logistics systems to deliver exhaustive and timely analytical insight as part of the Secretary of the Army's drive toward data-centricity in the posture for contested operations in multiple theaters.

To delve into all things EBS-C and its supporting data transformation efforts, *Army Sustainment* sat down with three of the Army's foremost leaders in the acquisition, development, and deployment of the Army's converged and modernized business system.

- Brig. Gen. Michael Lalor, commanding general of Tank-automotive and Armaments Command (TACOM) at Detroit Arsenal, Michigan, and previously served as the commandant of the Army's Ordnance School and the director of the EBS multifunctional capabilities team (MFCT).

- Jen Swanson, deputy assistant secretary of the Army for data, engineering, and software of the Pentagon's Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology.

- Ross Guckert, the Army's program executive officer for Enterprise Information Systems at Fort Belvoir, Virginia.

How has the Army's understanding of data-centric operations evolved? What do successful data-centric operations look like at echelon?

Guckert: In the past, there existed a natural tendency to primarily look at data operations from the standpoint of manual and independent execution across organizations and geographical areas. That may come as a complete shock to some reading this, as their perception of reality is one that absolutely must be defined by automated processes connected through resilient networks that inform nearly all decisions. Over the last two decades, the Army — and the Department of Defense writ large — realized and

made clear what a successful approach to data entails at every echelon: the enablement of rapid and accurate decisions by commanders across warfighting functions wherever they may be executing mission command. You see the descriptor stove-piped thrown around a lot to describe that past reality, wherein seemingly every unit created their own ground truth representation of reality based on whatever data they had at their disposal. We know that model can't and won't hold true today and into the future, and we're getting after this by integrating once disparate streams of data up and down the echelon spectrum.

Swanson: Our understanding of what data-centricity means has evolved massively over the last 10 to 15 years, and I believe we as an Army are now really starting to walk the walk, so to speak. Domain owners, beyond just logistics, have a firm grasp of the importance of data to a Soldier's operational success, wherever they may be serving. Data-centricity means that I, as a sustainer or otherwise, have access to valid, high-quality data when I need it to support analyses, ensuring I can make better decisions faster.

Lalor: The Army's entire approach to data — both its infrastructure and analytical use — has evolved from our ability to ask the hard questions about what we can and should do with the data we have at our disposal. Data centricity, in its simplest form, should support informed decisions across echelons in any operating environment through, as Ms. Swanson mentions, access to quality data. As an example, during my time as the Chief of Ordnance, we spent a lot of time discussing how to effectively leverage data to optimize system maintenance using service versus purely time-based intervals. The framing of the question is simple, but it all becomes a much more vexing problem if you can't use data as the underpinning of your policy change or resolution. In any and all contexts, data helps us see the ground truth.

Turning the Army's massive streams of data into a warfighting asset is front of mind across the enterprise. How will the service's new Unified Data Reference Architecture (UDRA) advance progress made on that front?

Swanson: Over the past year, we've worked to develop the UDRA. This is a data mesh-based architecture that is vastly different than what we were doing before, all in the name of converting data to a commodity that drives readiness in every operational space, including the tactical area. What we want to move away from is having our data centralized in a massive data lake that lacks the proper governance or agility to be useful down the echelon stream. What we gain from a data mesh concept is increased standardization, interoperability, and access to data products within a distributed architecture that neatly organizes those products into relevant domains. This also gives more control to domain owners — whether they're in logistics or fires or wherever else — to define the data products they need in this distributed architecture that controls for the network challenges we are posturing for in large-scale combat operations. I'll re-emphasize that this represents a significant departure from a data lake approach that requires a lot of bandwidth-intensive data replication and movement.

Talk about the genesis of EBS-C as a concept progressing toward capability. How far have we come, and what's left to accomplish?

Guckert: The idea to converge our EBSs was really borne from the desire to drastically improve our logistics and finance business processes to ensure they were both responsive to warfighter needs and fully auditable. In the past, we've successfully deployed those EBSs and continue to use them today, but we certainly recognize there are improvements to make as we drive toward a single enterprise solution that integrates those logistics and finance systems with several others. In just a few short years, I think we've come really far in this advancement because of how closely we've integrated the technical and functional aspects of the broader effort. With constant support from more than 250 functional experts across the Army, all of EBS-C's business process reengineering efforts led by the EBS-MFCT have kept development fully on track. Moving forward, the agile processes we have in place — in governance, acquisition, and software development — will ensure EBS-C's continuous improvement and deployment. In the near term, just back in August, we awarded an Other Transaction Authority to three vendors to begin a nine-month prototyping effort, culminating in a follow-on contract in the back half of fiscal year 2024.

Lalor: EBS-C has progressed in leaps and bounds over the last three or so years. Perhaps the greatest change has been recognizing that this isn't solely about software; rather, EBS-C is an all-encompassing modernization strategy. The focus is less on what software we have and more on how we're leveraging that software to adjust and improve business processes. Through several rounds of business process reengineering and two capability requirement documents, we're now at a point of prototype delivery at the end of 2023 and into 2024. Mr. Guckert and Ms. Swanson are both intimately familiar with the agile acquisition and development processes we adhere to, compressing that end-to-end development process. EBS-C's size and scope are massive, encompassing what is potentially the largest business transformation effort the service has undertaken with positive impacts at all echelons. From a sustainment perspective, we're looking to EBS-C to add speed to the entire logistics lifecycle even before it's fully operational as one converged system, from parts requisition to fully modernized maintenance practices.

Building on EBS-C as a capability, how do you see its end-state enabling the tactical sustainer to operate in a contested environment?

Guckert: EBS-C turns data into a foundational enabler of sustainment processes at both the strategic and tactical level, with the onus placed on business process owners to define and concurrently update data models and products in accordance with specific standards. So, how does this help our tactical teammates in a contested environment? As Ms. Swanson mentioned earlier, this integration and standardization will be essential to the implementation of the UDRA and a federated, distributed data mesh construct that will afford users at any echelon access to the data they need in near real-time.

Lalor: As Ms. Swanson delved into, data to support operations at the tactical edge is our North Star in these data-centric endeavors. If it's coming from the tactical space, then that's really our primary demand signal from which we form a truly holistic picture of everything from production to posture. EBS-C will enhance end-to-end, cross-echelon visibility of commodities and business functions that we simply haven't had a clear sight of as an Army. Being able to see in time and space ensures you can actually be predictive and precise in your delivery of sustainment support — both of these we know will be imperative in contested environments.

Brig. Gen. Lalor, you recently took command of TACOM. What lessons from your time at the helm of the Ordnance School and the EBS-MFCT are you bringing with you to Detroit Arsenal?

Lalor: In my short time at TACOM, and in the context of my prior position, I've realized what a great opportunity we have to clearly define where the operational and strategic echelons integrate each and every day on behalf of the tactical. Defining and optimizing those interactions will help us tackle production or workload challenges that have the greatest impact on tactical sustainers. Operating in that interstitial space is really exciting because we can connect the dots on what the future operating environment will look like from each purview. Additionally, the ways in which we communicate the benefits of EBS-C are something I'll carry forward, and any time we can reduce the manual burden when it comes to cumbersome data processing tasks is a huge win for both our analysts and maintainers alike.

Ms. Swanson, you've talked about bringing software to the tactical edge while working to ensure the Army's program executive offices (PEOs) have appropriate control of the software development lifecycle. In a broad sense, how will this impact the Army sustainment enterprise?

Swanson: Software drives our systems and is the mechanism for us to deliver rapid capability increases to maintain overmatch. The Under (Secretary of the Army) and Vice (Chief of Staff of the Army) approved continuous integration/continuous delivery as the

Army's path forward for software development and are supporting many changes to Army processes to enable it. As a result, Army sustainers, and all other Soldiers and users, will benefit tremendously by receiving the best capabilities much more rapidly.

Acquiring and tailoring commercial software capabilities to meet the complex needs of the Army has long been an onerous, slow process. What changes are you working on to flip this script to ensure the service can leverage industry capabilities faster and more effectively?

Guckert: At PEO Enterprise Information Systems (EIS), we meet with our industry partners on an almost daily basis to ensure we're on the same page about our demand signals and unique operational constraints. We do this to ensure we're inherently unrestrictive in driving innovation using industry best practices that will enhance our mission set on behalf of the Army. You'll hear many of us in this space talk about adopting the agile methodology alongside industry to completely streamline activities from requirements development to capability deployment.

Swanson: We are limiting the tailoring or customizing of commercial software products and instead are leveraging microservices and other tools to add custom capabilities. This allows us to deliver much faster and enables us to keep up more as technology changes.

Based on how far the Army has come with the UDRA, what will be the most exciting developments over the course of the next six or more months?

Swanson: What's most exciting is what we've accomplished in a relatively short amount of time regarding the UDRA's completion. The team has developed a framework within which project managers can build. I wish I had this when I was in different PEOs because it's one of the most effective ways to enhance system interoperability and eliminate stove pipes. A lot of work comes with that, so between now and the end of this year, we'll look to increase our information exchange with industry, both in the cloud and on-premises, to shore up UDRA compliance and test its implementation. There's still a lot to accomplish, but I'm really proud of how far we've come in the last six to twelve months on behalf of the Army.

Mr. Guckert, where else is PEO EIS working to be as "commercial as possible, as military as necessary" in the sustainment space?

Guckert: Having those constant touchpoints that drive transparency and openness with commercial vendors really sets up our successful partnerships. We aim to ensure that industry is developing capabilities that will integrate seamlessly with our existing systems while minimizing follow-on customization that simply adds burden to our users. We want to leverage low- or no-code solutions that require minimal maintenance and are built on open architectures, so we're working to ensure industry knows what they need to do to best integrate with what we have already built so any improvements we make are iterative as opposed to a complete overhaul. At the end of the day, we're leaning forward and doing everything we can to adopt commercial best practices where they fit sensibly within our current framework of operations. This is a symbiotic relationship that we take very seriously to deliver information advantage and decision dominance to our warfighters at every echelon.

Mike Crozier was recently a strategic analyst in the Army G-4's Logistic Initiatives Group. He holds a master's degree from Georgetown University, Washington, D.C.

Feature Photo
Top: Brig. Gen. Michael B. Lalor speaks with Amentum team member Phillip Sacher in Red River Army Depot's secondary items production facility, Sept. 7, 2023. (Photo by Adrienne Brown)

Bottom Left: Ross Guckert attends AFCEA TechNet Augusta, Aug. 16, 2022. (Photo by Susan McGovern)

Bottom Right: Jen Swanson participates in a panel during the Advanced Planning Briefing to Industry at Aberdeen Proving Ground, Maryland, April 26, 2022. (Photo by Megan Clark)

Executing Sustained Logistics Support for the Defense of Ukraine

By Lt. Gen. Christopher Mohan, Maj. Gen. David Wilson, and Brig. Gen. Brad Nicholson

Army Materiel Command (AMC) has been at the forefront of delivering record amounts of military aid to Ukraine as that nation defends against Russia's unprovoked full-scale invasion that began in February 2022. Ukraine is a key regional strategic partner and remains an urgent security assistance priority for the United States.

Much of AMC's heavy lifting has been done by the U.S. Army Security Assistance Command (USASAC) and Army Sustainment Command (ASC), but the entire AMC and greater Army sustainment enterprise have had crucial roles, including Tank-automotive and Armaments Command, Army Contracting Command, and Military Surface Deployment and Distribution Command. Each command and agency has unique contributions as it supports a whole-of-government approach to Russian aggression in Ukraine.

AMC's specific role is ensuring the safe and speedy delivery of materiel and services, enabling its partners to defend themselves and bolster regional stability and democratic values. Employing the fort-to-port-to-foxhole concept, AMC has identified needed equipment and established a steady logistics flow to deliver precision sustainment and materiel readiness from the strategic support area to the tactical point of contact. It has done so by adapting in real-time as the sustainment enterprise has operated outside the bounds of conventional doctrine and remained flexible and agile to provide quick, efficient support.

As the lead for AMC's Security Assistance Enterprise and during the initial phase of the Presidential Drawdowns, USASAC was the primary coordinator working with the AMC major subordinate command's Security Assistance Management directorates and the Assistant Secretary of the Army's (Acquisition, Logistics, and Technology) program executive offices. These organizations collaborated in developing the draft Presidential Drawdowns, identifying equipment availability from stock, or procuring defense items directly from industry — all while assessing impacts to readiness.

USASAC continues to support the presidential drawdowns by managing the Army property book and identifying and coordinating the delivery of excess defense articles to Ukraine. This facilitates modernization efforts by replacing old materiel with newer items, as the Army sends equipment from stock and replaces the stock with modernized equipment, maintaining readiness.

Pursuant to a delegation by the President, the emergency Presidential Drawdown Authority has been used on 42 occasions since August 2021 to provide Ukraine military assistance directly from DOD stockpiles.

Meanwhile, ASC has been actively engaged with leveraging the presence of Army field support brigades (AFSBs) to play pivotal roles in swiftly delivering essential equipment to allies and partners, meeting their urgent requirements with remarkable efficiency. Thanks to the strategic placement of AFSBs worldwide, including in Europe, these brigades have bolstered the support network and strengthened collaborations, ensuring swift and efficient assistance when and where it mattered most.

From the Army's organic industrial base (OIB) depots and facilities to the ports in the U.S. and Europe, and then overland by truck and rail to the fight, AMC has been agile and has adapted to help reinforce a sovereign nation's capacity and readiness.

As just one example, the short-notice coordination and execution to move 31 M1A1 Abrams tanks halfway around the globe was a tremendous success as it quickly and safely provided critical warfighting resources where they were needed most. The military aid that AMC facilitates is making its way to Ukrainian battlefields at an unparalleled pace, sometimes within days instead of the months or years that foreign military sales (FMS) cases can historically take.

To date, USASAC has facilitated the delivery of more than $13 billion in weapons, training, and materiel since the beginning of last year's invasion. The multibillion-dollar security assistance packages include items like anti-aircraft and anti-armor systems, unmanned aerial systems, artillery, rocket systems, armored personnel carriers and other wheeled and track vehicles, body armor, munitions, medical supplies, and protective equipment.

Security assistance and FMS may not, in and of itself, be built for speed, but the war in Ukraine has shown the agility and responsiveness the optimized logistics supply chain is capable of in a contested environment. This is not a new mission; AMC has successfully executed resupply and field maintenance for over half a century and continually finds ways to innovate and streamline the processes. These cumulative improvements are facilitating the delivery of multibillion-dollar military aid to Ukraine around the clock and at unprecedented speeds.

To make that happen and ensure the resources are available — from munitions to their lethal delivery methods — industrial base operations are performing at peak capacity. Even in a modernization transformation process, the 23 depots, arsenals, and ammunition plants that make up the Army's OIB are manufacturing and resetting Army equipment to maintain readiness and operational capability throughout Army formations, as well as to allies and partners abroad. Sufficient capacity is continuously maintained and balanced with production, stockpiling, and forward positioning to meet this current strategic surge requirement. And the artisan workforce is not simply operating from within the confines of its facilities. It is deployed worldwide to provide critical maintenance support at the point of need.

AMC has not stopped with Ukraine. Ukraine's lessons and takeaways have amplified concerns about the future. Many lessons can be applied directly to support the Army's priority effort in the Pacific. Remote maintenance distribution centers, as employed to support Ukraine, provide a forward capability that can be translated to other theaters globally. In practice, it may not look the same each time, but the concept can be applied globally.

Unlike Europe, the realities of the size of the Indo-Pacific Command area of responsibility require multi-model, multi-service, and joint approaches. The sustainment enterprise works with multiple stakeholders within the Joint Staff, Army Staff, and Office of the Secretary of Defense to codify doctrine and modify sustainment planning based on what the Army and the Joint Community think the future fight may hold. This problem is challenging; services must rely on more than past experiences.

If Ukraine taught the world one thing, the U.S.'s partners and allies cannot wait for the first shots fired, which means the Army cannot wait and must set conditions in the theater before crisis or conflict. AMC, working with U.S. Army Pacific (USARPAC), is preparing the theater now. Predictive sustainment requires a data-driven approach. Using the observations from Ukraine, particularly Security Assistance Group Ukraine's use of the AMC Predictive Analytic Suite (APAS), USARPAC utilizes APAS's analytical capabilities to build partner capacity, identify bulk storage sites for common stocks, validate early entry requirements, and work cross-ACOM to enable strategic sustainment activities from foxhole to depot.

AMC continues to improve APAS capabilities and knows commanders do not need another dashboard of stuff. Instead, commanders need refined, analyzed data with options and risks assessed to make decisions. There is no other theater where this matters more than the Pacific.

Implementing artificial intelligence and machine learning through exercises such as the Unified Pacific Wargame Series and Talisman Sabre allows the sustainment enterprise to refine systems and processes. Participation in these key operations enables experiential learning opportunities on data systems to predict future requirements and provide materiel readiness at predetermined locations.

AMC also leverages Army pre-positioned stock (APS) to set areas from Australia to the first island chain in support of combatant commanders. APS capability is both a deterrent and a strategic asset for conflict. Through ASC, implementing and executing contracts prepare multiple theater locations to establish basing options. This advanced planning effort will build a programmatic approach toward refining support to theater requirements and generate data in the process, establishing a baseline that will become the building blocks for which future systems operate and provide decision-support capabilities to commanders on the ground.

No area of operation has an easy button, but AMC and the sustainment enterprise are taking deliberate steps to set and prepare theaters. One thing is sure: data will drive the next fight as it is driving the current battle now.

In addition to helping an imperiled democratic nation in Ukraine, building partner capacity, supporting combatant command engagement strategies, and strengthening U.S. global partnerships, we do this because, in the simplest terms, it's the right thing to do. AMC delivers.

Lt. Gen. Christopher Mohan serves as the deputy commanding general of Army Materiel Command, Redstone Arsenal, Alabama. He has had command assignments in First Army and Army Sustainment Command, Rock Island, Illinois, and the 21st Theater Sustainment Command, U.S. Army Europe and Africa in Kaiserslautern, Germany. He was commissioned into the Army in 1989 from Appalachian State University, North Carolina. He holds a Master of Science in national security and strategic studies from the Naval War College and a master's degree in military strategy from the Army War College.

Maj. Gen. David Wilson serves as the commanding general of Army Sustainment Command, Rock Island, Illinois. He served as the commanding general of the 8th Theater Sustainment Command at Fort Shafter, Hawaii. He was commissioned as a field artillery officer upon graduation from The Citadel, The Military College of South Carolina, in 1991. He holds a Master of Science in general administration from Central Michigan University and a Master of Science in national resource strategy from the Industrial College of the Armed Forces.

Brig. Gen. Brad Nicholson serves as the commanding general of the U.S. Army Security Assistance Command, Redstone Arsenal, Alabama. He served as the Deputy G-5, U.S. Army Europe and Africa in Wiesbaden, Germany. He was commissioned in 1998 as a field artillery officer through ROTC at North Carolina State University. He is a doctoral candidate in political science at the University of Utah.

Munitions Sustainment

Data-Informed Munitions Allows Leaders to Make Better Choices

By Chief Warrant Officer 4 Michael K. Lima

Tactical munitions management requires a fundamental change as the Army moves into the future with acute and pacing challenges from other nations. Tactical, operational, and strategic munitions managers must be able to assist commanders in visualizing, describing, and directing the Class V commodity in large-scale combat operations. The amount of munitions that moves through the logistical supply system and gets expended is only one data point that must be captured to drive decisions. The amount of data available for munitions from the vast number of sources outpaces the munitions staff's ability to process information for decisive actions in combat.

Operations Process

Army Doctrine Publication 5-0, The Operations Process, states the Army's framework for organizing and putting command and control into action is the operations process, the major command and control activities performed during operations: planning, preparing, executing, and continuously assessing the operation.

Planning is the art and science of understanding a situation and helps create a shared vision between commanders and staff at each echelon. With support from the munitions material managers on their staff, commanders use the operations process to develop conceptual and detailed munitions planning to understand an operational environment, which is a composite of the conditions, circumstances, and influences that affect the employment of capabilities. This planning results in an operations plan and order synchronizing munitions support to meet military objectives. Munitions logistics planners at each echelon should be involved in operations with all the available munitions data to maintain situational awareness, understand targeting priorities, identify and mitigate explosives safety risks, and enhance shared understanding among the noncommissioned officers, warrant officers, and branch commissioned officers that sustain munitions.

Munitions Data

The ability to organize, describe, and visualize munitions data from an array of systems to solve complex sustainment problems with data-informed decisions

is required for achieving the Army of 2030, ensuring it can sustain the fight across contested terrain and over time. There must be a fundamental reform of translating munitions data to inform commanders' decisions. There are many sources of munitions data points, including the following:

Conventional Ammunition Packaging and Unit Load Data Index, provided by the Defense Ammunition Center (DAC), is an unofficial guide for informational purposes for military and civilian DOD personnel responsible for conventional ammunition unitization, storage, and shipment planning.

The Yellow Book provides hazard classification, physical security, marking, transportation and storage data, and criteria for selected ammunition and explosive items. The publication is a field consolidated reference of basic data and regulatory criteria.

The Substitutability/Interchangeability List indicates substitute and interchangeable items for ammunition managers at all levels and is a ready reference for commanders and their staffs and ammunition personnel at all echelons.

The Army Materiel Command (AMC) Drawing 19-48 series indexes all DAC unitization, storage, and outloading drawings applicable to Army Class V munitions items. The index provides a reference for acquiring procedural drawings to ensure the safe, economical, and standardized unitization, storage, handling, and outloading of ammunition commodities and related ground support equipment.

The Army Enterprise Systems Integration Program Hub provides a centralized method for authoritative Army enterprise master data management. That enables near real-time field readiness intelligence through a single-entry platform.

The Joint Program Executive Office Armaments & Ammunition Portfolio Book provides Class V system description, capabilities/system characteristics, weapon systems, and prime contractor data.

The munitions data gathered from all these sources are just facts with a particular meaning, but not yet information. Information is a set of data relevant to staff in a specific time frame but may not be considered knowledge. Information becomes knowledge when an understanding of the significance to operations can be communicated for decision-making. What enables decision-making is the ability to pull data and information from munitions' logistical information systems to create knowledge for a shared understanding for commanders assisted by their staff.

Munitions Systems

Army munitions systems include many logistical systems used by various echelons. The critical functions of tactical units are the ability to forecast and approve munitions requirements, process and validate operational and training munitions requests, and report expenditure metrics. Reporting munitions status through manual logistical status reports is as essential as automated means. One crucial system is the Total Ammunition Management Information System (TAMIS), the munitions requirements generator, prioritization tool, and reporting system for Army organizations. The system calculates, validates, approves, and distributes munitions authorizations and collects expenditures. Additionally, the system is a web-based enterprise information system that processes unclassified data.

Munitions requests from TAMIS go to the Standard Army Ammunition System. The Army ammunition management system is designed for Class V conventional ammunition and related component and packaging materials. The system is the accountable property system of record for ammunition stored at the retail level and operates in near real-time at all functional levels in the theater of operations.

The system provides commanders at each level with automated asset visibility supported by online communications supporting combat operations. It integrates ammunition management functions between the material management branches (centers) and storage sites (ammunition support activities), including:

- Theater and corps materiel management branches or Army service component command equivalent.
- Ammunition support activities include theater and corps ammunition supply points, ammunition transfer and holding points, and modular ammunition transfer points.
- Installation ammunition supply support activity.

Additional munitions systems include the Munitions History Program, which collects and stores inspection and test data and tracks ammunition technical history quality assurance data. The Logistics Modernization Program supports the AMC industrial base, an enterprise resource planning solution that manages and tracks the order and delivery of equipment ranging from ammunition asset management through manufacturing. The Ammunition Enterprise Portal meSpace is an enterprise environment that integrates business processes within the Joint Munitions and Lethality Life Cycle Management Command community to support developing, procuring, and supplying ammunition. While all the legacy munitions systems have been updated since their inception, modernization efforts have ensured munitions planning creates better value to sustain warfighting function.

Munitions System Modernization

No improvement is needed more than the tactical level Ammunition and Explosives Safety Munitions Risk Management, the overarching NATO policy that defines roles and responsibilities concerning risk management on NATO missions and describes the risk management process to be followed if specific safety criteria in explosives cannot be met. Two efforts underway using U.S. defense explosive safety criteria are Expeditionary Ammunition Site Planning – Software (EASP-S) and Blast Radius. EASP-S is used to develop the capability to help military ammunition inspectors rapidly plan and lay out theater ammunition storage areas in an expeditionary environment, reduce encroachment, and increase munitions survivability. The Blast Radius application, developed by the Army Software Factory, is a quick and easy way to assess hazards while storing ammunition and explosives in field environments.

One of the most fundamental reforms to munitions data comes from Enterprise Business System - Convergence (EBS-C). EBS-C will enable the munitions modernization and transformation effort to collect, streamline, standardize, and unify military operations regarding munitions planning from national strategic to the tactical, including munitions sustainment operations from national stockpiles to the forward line of troops at the tactical edge of the battlefield.

Conclusion

Munitions system modernization is making great developments and significant reorganization with technical innovation for the future battlefield of Army 2030. Munitions will always play a vital role in achieving military objectives. The Army, particularly sustainment organizations, must leverage commercial innovation and munitions data-driven sustainment, which comes to fruition from key leaders with the vision to see what can be done. In the not-so-distant future, munitions planners could be able to create a Class V common operating picture with virtual and augmented reality, navigating the battlefield, homing in on the locations of all ammunition support activities, and scrolling through window displays to see the percentage of available munitions, their capabilities, service condition, and exact location within the storage area. Munitions' data-driven sustainment allows for quickly taking a vast amount of data and creating knowledge for key decision-makers to ensure victory on the battlefield.

Chief Warrant Officer 4 Michael K. Lima currently serves as the training developer with the Ordnance Training Development Division. He is assigned to the Ordnance Corps and Ordnance School under Combined Arms Support Command at Fort Gregg-Adams, Virginia. He has conducted Training Within Industry with a prime missile defense contractor and was an accountable officer for the Army ammunition supply point at Kadena Air Base in Okinawa, Japan. He holds a doctorate in business administration from Baker College Center for Graduate Studies, Michigan.

Feature Photo
Top: The senior staff of Vectrona Innovative Systems and Technologies advise enlisted leaders of the aircraft armament systems and munitions systems career fields during a technology demonstration, Jan. 8, 2019, at Joint Base Langley-Eustis, Virginia. (U.S. Air Force photo by Tech. Sgt. Daryl Knee)

Middle: A demonstrator shows how augmented reality can be used to view floating dialogue boxes for individual parts of a mock missile during a demonstration at Joint Base Langley-Eustis, Virginia, Jan. 8, 2019. (U.S. Air Force photo by Tech. Sgt. Daryl Knee)

Bottom: A virtual reality headset is on display during a technology demonstration at Joint Base Langley-Eustis, Virginia, Jan. 8, 2019. (U.S. Air Force photo by Tech. Sgt. Daryl Knee)

Leveraging Cloud Resources to Modernize Data Education at ASU

By Maj. Ryan E. Miller and J. Scott Billie

The Army is catching up with the digital age to teach a data-centric culture. Cultural change on this scale requires data education modernization efforts to nest appropriately at all levels throughout the force. Army Sustainment University (ASU) serves as the education epicenter for the Army sustainment community and is developing a data education approach. Part of this strategy calls for exceptional sustainers to continue their data education progression and become data specialists.

The Operations Research and Systems Analysis (ORSA) Committee from the College of Applied Logistics and Operational Sciences (CALOS) at ASU is performing a complimentary modernization effort to integrate data science into ORSA development. In 2016, the ORSA Committee was asked by the ORSA proponent at Headquarters, Department of the Army (HQDA) G-8, to modernize the ORSA development curriculums to include data science education. Efforts toward data science modernization

focused on incorporating data analysis through programming, emphasizing the R programming language in the ORSA military applications and Functional Area 49 qualification courses.

Local Network Enterprise Center (NEC) restrictions and work order delays have hindered the maintenance and continued modernization of R programming in both courses. Under current NEC agreements, only select functionality from static and older R software versions is permissible for installation on government-furnished equipment (GFE). About one-third of all ORSA Committee work orders involves permissions for R software. Although approved for instructor and student use, network scans do not recognize the R software and often disable or delete it. Delays in resolving these tickets significantly detracted from the data science learning experience. Classroom and technology limitations necessitated a change to this initial modernization approach.

To move from the industrial Army to a digital one, ORSAs and sustainers need modern educational and training resources to maintain their competitive edge and to underpin decision-making with analysis. Furthermore, students should receive instruction on the tools they can access in the operational workforce. In the summer of 2022, CALOS empowered the ORSA Committee to develop a feasible, resilient, and zero-cost-to-ASU approach to data science curriculum modernization that benefits ORSAs and data specialist sustainers. The ORSA Committee looked to the cloud for a solution, which means accessing the shared resources of someone else's more powerful computer through a web browser. Leveraging cloud resources enables modern data education resource development for data specialists, facilitates ORSA training, and connects ASU to the data professional community across the Army.

In particular, the ORSA Committee leveraged an existing cloud resource managed by HQDA G-8, the Army Resource Cloud (ARC). The ARC is a CAC-enabled impact level (IL) 4 environment hosted on the DOD information network (DoDIN) by Amazon Web Services GovCloud. An IL4 designation allows users to analyze up to controlled unclassified information level data (no personally identifiable or protected health information) per Defense Information Systems Agency security technical implementation guide requirements. Being hosted on the DoDIN means users must be on GFE or able to use a virtual private network to access the Nonclassified\ Internet Protocol Router Network to reach the ARC resources subsequently.

The web administration team from HQDA G-8 partnered with the ORSA Committee to provision developer accounts for all ORSA instructors and students to access RStudio Workbench in the ARC to develop code in R. Additionally, ORSA instructors were licensed with publisher accounts in RStudio Connect in ARC to publish reports, analysis, applications, dashboards, and other instructional resources to share with data consumers. Leveraging these cloud resources enabled the ORSA committee to take full advantage of the most up-to-date R software and to publish living resources for ORSA and data specialists across the Army.

The ORSA Committee realized this modernization effort needed to include collaboration with operational data science professionals to leverage current industry-standard techniques. ASU formalized a collaboration relationship with the Center for Army Analysis to conduct an ASU data science study to enable and achieve data education-related priorities for ORSA and data specialists across the Army. The study priorities include inculcating data culture by leveraging partners and developing tools to support life-long learning; delivering rigorous, outcomes-based education to ensure data education curriculum content is both critical and relevant; and allowing field experts to reassess the curriculum with the educational institute to bridge the gap between education and the industry standard tools and techniques used in the operational workforce. The study partners are executing these priorities to develop a collection of data education resources using ARC and GitLab to enable version control and project code collaboration.

The study currently focuses on developing an R Supplement resource book for the ORSA Military Applications Course (ORSA-MAC). Each ORSA-MAC block of instruction is represented as a chapter using the R Markdown file format. Chapters begin with a military application of the data skill and are subdivided into lessons with associated lesson objectives. The purpose of this resource is to supplement the in-class instruction on mathematical topics such as statistics and probability, with R programming serving as a modern alternative solution method. The first five blocks of ORSA-MAC, consisting of computer programming, statistics, probability, data analysis, and simulations, have been available to students since mid-April 2023. The entire ORSA-MAC R supplement book is anticipated to be completed before January 2024.

Resources published from the study also support the development of data specialists. One of the challenges of implementing a data education strategy is that students have diverse backgrounds and experiences regarding data education. The study's collection of data science resources allows data specialists to advance their data education skills by developing R and Python programming to solve problems that require advanced data analysis and machine learning tools and techniques. The following phase 0 and phase I data education collection resources are currently available for public consumption on Connect:

https://cprobe.army.mil/rsconnect/CAA_Intro_to_R/ for Beginner/Intermediate Introduction to R Programming.

https://cprobe.army.mil/rsconnect/CAA_Intro_to_Python/ for an Introduction to Python.

https://cprobe.army.mil/rsconnect/Q_Course_DS/ for the ORSA Qualifications Course Data Science Training.

https://cprobe.army.mil/rsconnect/an_intro_to_r_for_analysts/ for a self-paced 10-hour Introduction to R Programming.

The ARC modernized the ORSA approach to programming and data science. Changing the teaching medium from local software installation to cloud reduced the R-related trouble tickets for the local Fort Gregg-Adams NEC from 21 (February-August 2022) to 0 (September 2022-March 2023). The time saved on creating and actioning trouble tickets enables NEC technicians to focus on other priorities to improve information automation capabilities across the installation. However, utilizing cloud resources for training can become problematic if network outages occur.

Leveraging cloud resources has generated multiple opportunities for ASU to modernize data education by providing a platform for training, development, and resource consumption. The ongoing data science modernization efforts by the ORSA Committee provide data education opportunities for current ORSA and sustainer data specialist students and further development opportunities for data analysts across the Army. The ORSA Committee's approach to modernization through cloud resources has already saved the government time and has significantly improved the data science learning experience of the ORSA students. The living resources generated by the study will continue to be updated to ensure students use modern data science and analysis tools to solve modern problems.

Maj. Ryan E. Miller currently serves as an instructor for the Operations Research and Systems Analysis Military Applications Course within the College of Applied Logistics and Operational Sciences at Army Sustainment University (ASU). He serves as the project lead for the ASU data science study. He holds a Master of Science in applied mathematics from the Naval Postgraduate School. He also completed the Master Teacher Program at the United States Military Academy.

J. Scott Billie serves as the chair of the Operational Research and Systems Analysis (ORSA) Committee, as course director for the Functional Area 49 Qualification Course, and as an instructor in the ORSA Military Applications Course and the ORSA Familiarization course. He retired from the Army as a lieutenant colonel. A graduate of the U.S. Military Academy, he has a Master of Science in engineering management from Old Dominion University, Virginia, and a Master of Science in computational operations research from the College of William and Mary, Virginia.

Editor Note: This article was a selection from the Army Sustainment University President's Writing Competition.

EMPOWERING Tactical Sustainment

Key Strategies for Harnessing Data in the Army of 2030

By Lt. Col. Xeon Simpson

As the dawn of 2030 approaches, the Army is forging ahead on a bold path, investing in revolutionary technologies to shape an agile, technologically proficient, and adaptive force ready for the challenges of tomorrow's battlefield. In the Spring 2023 edition of *Army Sustainment*, Gen. Charles Hamilton, commanding general of Army Materiel Command, wrote, "Sustainment leaders of the future must be able to understand and employ the knowledge and power of data and information as critical readiness assets to inform future sustainment actions reliably and rapidly as combat multipliers." Tactical sustainment formations are indispensable for mission success in the rapidly evolving landscape. Responsible for delivering vital logistics and sustainment support, the mission complexities of brigade support battalions (BSBs), division sustainment support battalions (DSSBs), and combat sustainment support battalions (CSSBs) are amplified in a contested multidomain operational environment. Commanders and leaders must create a data-centric culture and commit to continuous learning immediately to enhance operational efficiency and effectiveness and adequately equip the sustainment leaders of the Army of 2030. This article recommends key strategies for educating and training BSBs, DSSBs, and CSSBs, enabling them to harness data to its fullest potential.

Creating a Data-Centric Culture

The transformative potential of data in military operations is immense. Harnessing this potential requires a paradigm shift toward a data-centric culture where evidence-based decision-making precedes intuition. This shift requires a significant investment in comprehensive data literacy training for the officers, warrant officers, and noncommissioned officers at echelon. From understanding basic data collection techniques to mastering advanced data analysis and interpretation, BSB, DSSB, and CSSB personnel at all levels must be equipped to utilize data promptly and effectively. Notably, the sensitivity of sustainment data also calls for rigorous training in data security practices, ensuring personnel understand how to protect and responsibly use vital information. As the spectrum of potential battlegrounds expands across the five domains, so does the requirement for specific knowledge and skill sets for effective tactical sustainment operations. The first step in educating tactical sustainment units is cultivating a data-centric mindset. This mindset involves instilling an understanding of the value of data in the decision-making process.

Educating BSBs, DSSBs, and CSSBs on data-centric operations requires strong leadership support and guidance. Even if you do not know the difference between Python, C++, or R, it is essential to understand the potential benefits of the organization's ability to work through extensive amounts of data faster than ever before to provide leaders with actionable information. Commanders and senior leaders must emphasize the importance of data utilization, promote a culture of continuous learning, and allocate resources for training and technological advancements. Leaders can inspire their personnel to embrace a data-driven mindset by setting examples and championing data-centric practices. By emphasizing the importance of accurate and timely data, personnel within BSBs, DSSBs, and CSSBs can be encouraged to proactively seek and leverage information to support operational planning and execution.

Additionally, providing comprehensive data literacy training to personnel is crucial. This training should cover various aspects, including data collection, analysis, interpretation, and visualization. Equipping individuals with the skills to navigate and manipulate data effectively empowers them to extract meaningful insights, identify trends, and make informed decisions. Unit-level training programs incorporate leader development programs, staff training, or institutional training in person or virtually with online courses tailored to the unit's specific needs. Leaders must work with the Training and Doctrine Command and Combined Arms Support Command to nest their approaches to develop a comprehensive curriculum that covers relevant data analytics concepts, tools, and techniques tailored to sustainment operations within tactical formations. This curriculum should include modules on data collection, analysis, visualization, and

interpretation specific to sustainment functions. Unit commanders can implement a structured training and certification program that offers progressive levels of certification, such as basic, intermediate, and advanced, to accommodate personnel at different levels of expertise. This program can include classroom-based instruction and hands-on exercises utilizing real-world sustainment data sets, embedding sustainment-specific data analytics certification into existing training programs at the battalion and brigade levels. This integration ensures a standardized baseline of knowledge and promotes a consistent approach to data analytics across brigade combat teams.

Commitment to Continuous Learning

Tactical sustainment unit leaders must commit to continuous learning to facilitate ongoing professional development opportunities for their personnel. These could encompass certification programs, long-term leader development, workshops, and conferences focused on relevant topics. Sustainment-specific data analytical certifications equip personnel with the skills and knowledge to analyze and interpret data relevant to their specific operational domain. Continuous learning approaches enable leaders and staff to make informed decisions based on data-driven insights and mitigating risks and to capitalize on opportunities across unit manning cycles. This commitment concerns acquiring new technical skills and fostering a culture that values, understands, and effectively uses data. Done well, it will lead to improved operational efficiency for the supported organization. Data analytic certifications foster a consistently updating understanding of industry key performance indicators, enabling BSBs, DSSBs, and CSSBs to track, measure, and improve processes such as supply chain optimization and personnel management. Personnel can implement targeted improvements, streamline workflows, and enhance operational efficiency by identifying inefficiencies and bottlenecks. Through investment in and commitment to data analytics, battalions and brigades can gain visibility into resource utilization, including personnel, equipment, and supplies. Certification in data analytics equips leaders to identify surplus or underutilized resources, leading to better resource allocation and cost savings. Sustainment-specific data analytical professional development promotes a culture of continuous improvement within tactical sustainment formations. Sustainment leaders must become advocates for data-driven practices, fostering a mindset of seeking opportunities for optimization and innovation. This culture shift will lead to improvements in sustainment operations as, in Hamilton's words, we become the "Army of 2030 and design the Army of 2040." Continuous learning ensures personnel remain at the forefront of their fields and foster a culture of intellectual curiosity and adaptability, which are invaluable in the dynamic multidomain operations environment.

Commanders and leaders must create a data-centric culture and commit to continuous learning immediately to enhance operational efficiency and effectiveness and adequately equip the sustainment leaders of the Army of 2030.

Opportunities and Risks

In the quest to develop BSBs, DSSBs, and CSSBs into data-centric organizations, tactical sustainment unit commanders and leaders find themselves at the crossroads of promise and peril. The commitment comes from artificial intelligence (AI), which offers transformative potential in optimizing logistics, enhancing predictive maintenance, and improving decision-making. Commanders and leaders must seize opportunities in AI, invest in AI literacy, foster an organizational culture that embraces AI, and integrate AI tools into operational processes. The advent of AI has revolutionized numerous facets of military operations. AI can optimize logistics management, enhance threat detection, and facilitate predictive maintenance. BSBs should invest in AI education to enable their personnel to leverage these technologies effectively. Understanding how to work with AI tools, interpret their outputs, and integrate them into operational processes is key to capitalizing on AI's potential. Importantly, this should also include education on AI's limitations and potential ethical considerations, ensuring AI is used responsibly and effectively. However, increasing reliance on digital technologies also opens the door to new threats, particularly in cyberspace. Cybersecurity becomes indispensable to this data-centric transformation, warranting robust defense mechanisms against cyber threats. This necessitates comprehensive training in cybersecurity best practices, threat detection, and response strategies. In navigating this digital transformation, leaders must balance the pursuit of innovation with the imperatives of security, ensuring BSBs and DSSBs leverage the benefits of AI while safeguarding against the risks inherent in the digital age. The cyberspace domain brings with it a new array of threats. As BSBs become increasingly reliant on digital technologies, they must prioritize cybersecurity. Cybersecurity training best practices, threat detection, and countermeasures can significantly enhance a unit's resilience against cyber-attacks. Given the potential for catastrophic consequences should a BSB's digital system be compromised, investing in comprehensive cybersecurity education is a necessity, not a luxury.

Conclusion

In conclusion, as the Army stands on the brink of 2030, the path ahead is one of transformation and innovation. With a relentless focus on adopting revolutionary technologies, the Army is diligently working toward developing an agile, technologically proficient, and adaptive force that can confront the challenges of tomorrow's battlefield. Understanding the critical role of data and information as readiness assets, sustainment leaders at all echelons must equip themselves with the knowledge and power of data to inform future sustainment actions rapidly and reliably. In this evolving landscape, BSBs, DSSBs, and CSSBs play indispensable roles in mission success. However, their mission complexity is amplified in a contested multidomain operational environment. Commanders and leaders must foster a data-centric culture and prioritize continuous learning, enhancing operational efficiency and effectiveness. By embracing key strategies for educating and training these sustainment units, they can harness the full potential of data, ensuring they are properly equipped to lead the Army into the future, specifically toward the Army of 2040. Through these efforts, the Army will fortify its readiness and achieve unparalleled success in future battles.

Lt. Col. Xeon Simpson currently commands the 15th Brigade Support Battalion, 2nd Armored Brigade Combat Team, 1st Cavalry Division. He is a graduate of the Armor Basic Officer Leader Course, Petroleum & Water Officer Course, Combined Logistics Captain Career Course, Recruiting Commanders Course, and the Command General Staff Officer College. He has a master's degree in higher education administration from the University of Louisville, Kentucky.

Feature Photo
Sgt. 1st Class Courtney Valentin, assigned to the 15th Brigade Support Battalion, scrubs a database of unit overage repairable items to facilitate the return of monetary credit at Drawsko Pomorskie Training Area, Poland, March 27, 2023. (Photo by 1st Lt. Kirsten M. Sanders)

Seat at the Table

Integrating Medical Planning in All Major Operations

By Capt. John Gigante

Army medicine, health service support, medical planning, and medical logistics play crucial roles in any Army operation, especially as the Army shifts its focus from counterinsurgency operations to preparing for asymmetric large-scale combat operations (LSCO) against near peers. Now equally important in garrison, domestic training environments, and international exercises with partner nations, medical operations supporting an overall operation, whether maneuver or otherwise, are integral to sustainment plans.

In modern warfare, medical planners must sit at the table during the military decision-making process (MDMP), order production, and rehearsals. Medical considerations should not be treated as an afterthought or hand waved during the planning stages. Commanders and staff should not tolerate a generic, regurgitated one-slider for a medical concept of support. The plan must relate to the operation and be tailored to the personnel, equipment, terrain, and overall mission.

Army sustainers and combat arms professionals must actively embrace and empower medical operations officers and planners throughout the planning process. In many cases, this is not the fault of non-Army Medical Department (AMEDD) officers but possibly from inexperienced or junior medical operations officers not advocating for consideration. Many billets across the Army, especially as organizations struggle to fill positions, place junior leaders in roles that require more experience and grade. While, in most cases, this is a good opportunity for growth and development for the junior leader, it does have its downsides. Absent the expertise of a skilled and experienced senior noncommissioned officer to guide and train the officer, a junior officer working in a medical operations officer billet could easily hide in the shadows and offer little value to an organization, the rest of the staff, and the commander. While the chief medical authority of the unit is the unit surgeon, this provider may be distracted with a demanding clinic life while struggling to balance their role as a staff officer, leaving the medical operations officer to figure out staff functions and medical operations advising by trial and error.

Army medicine affects every Soldier and does not stop with the planner on staff. It provides critical support to Soldiers at all levels. Soldiers must be trained and rehearsed not only in the basics of Tactical Combat Casualty Care (TCCC) and combat lifesaver (CLS) skills but also in the fundamentals of casualty evacuation (CASEVAC), medical evacuation (MEDEVAC), and the different roles of care. The importance of Army medicine becomes even more significant in LSCO against near peers, where the intensity and scale of injuries may increase. Effective health service support ensures casualties receive timely and appropriate medical care, enhancing chances of survival and minimizing the impact on combat effectiveness.

Medical planning ensures medical capabilities are integrated into the overall operational plan. Medical planners assess the operational environment, anticipate medical requirements, and develop appropriate medical support plans. They coordinate the deployment and employment of medical units, ensure the availability of critical medical supplies and equipment, and establish MEDEVAC procedures.

Medical logistics is vital in providing the necessary resources to sustain medical operations. This includes procuring, storing, and distributing medical supplies, pharmaceuticals, blood products, and equipment. Effective medical logistics guarantee medical units are adequately equipped to provide quality care and maintain operational readiness. These positions demand a highly trained medical logistician. While numerous skilled AMEDD Soldiers are often asked to be cross-trained or dual-hatted as medical logisticians, units must prioritize employing an enlisted or officer medical logistician identified by their military occupational specialty (MOS) or area of concentration (AOC). The demands of this role are intense, necessitating decisions that affect Soldiers' survival, and should be filled by Soldiers with appropriate MOS or AOC, not someone learning on the job.

It is relevant to refer to Field Manual (FM) 4-02, Army Health System, which serves as a comprehensive guide outlining the principles and procedures for health service support in the Army. FM 4-02 emphasizes the critical role of Army medicine in supporting Army operations. It highlights the need for medical planners to actively participate in MDMP, order production, and rehearsals, ensuring medical considerations are integrated into the overall operational plan. The manual stresses the importance of training and rehearsing Soldiers at all levels in essential medical skills, such as TCCC and CLS. It also emphasizes the significance of educating Soldiers on the basics of CASEVAC and MEDEVAC, enabling them to understand and support the roles of care in evacuating the injured.

FM 4-02 underscores the need for effective medical planning, including assessing the operational environment, anticipating medical requirements, and developing support plans. It emphasizes the coordination of medical unit deployment, ensuring the availability of necessary supplies and equipment,

and establishing evacuation procedures. The manual also addresses the critical role of medical logistics in supporting health service operations. It provides guidance on the procurement, storage, and distribution of medical supplies, pharmaceuticals, blood products, and equipment, ensuring medical units are adequately equipped to deliver quality care and maintain operational readiness.

Doctrine in the Army is abundant and dense but vital. Written, published doctrine is often easy to read and understand, although sometimes lengthy. The challenge is that many leaders at varying levels do not know which doctrine to reference, as there are countless publications in the Army Publishing Directorate (APD). The takeaway is that simply taking the first step and familiarizing yourself with it, rather than hiding and ignoring it, is better than finding the perfect publication for one's problem.

The Army may face new challenges in future conflicts, particularly when encountering chemical, biological, radiological, and nuclear (CBRN) environments. The potential for CBRN casualties poses a significant concern, especially considering the historical lack of comprehensive training on handling such situations.

Leaders at every level must prioritize and train for CBRN threats. Developing and implementing effective strategies to mitigate the impact of CBRN hazards on Soldiers and the overall mission is essential. This includes equipping Soldiers with the necessary knowledge and skills to identify, protect against, and respond to CBRN threats. Back to doctrine, numerous smart cards, derived from doctrine and available through the Army Training Network and APD, simplify these types of training that any leader can plan and execute.

Future wars will significantly increase the number of casualties per battle, potentially surpassing levels not witnessed in decades. The evolving nature of warfare and the potential use of advanced weaponry and tactics by near-peer adversaries may lead to more intense and widespread combat engagements. Given the possibility of thousands of casualties in a single battle, it becomes even more critical to prioritize medical considerations and integrate them at every level of planning. Medical operations should not be treated as an afterthought but as an integral part of operational and strategic planning.

The significance of medical readiness and preparedness cannot be overstated. All Soldiers, regardless of their MOS, must possess basic medical skills and be trained to provide initial medical care, including TCCC and CLS. This ensures immediate lifesaving measures can be administered on the battlefield, potentially saving lives and maintaining combat effectiveness. Moreover, medical planners must actively participate in planning, incorporating medical considerations from the outset. This integration includes anticipating CBRN threats, assessing medical requirements for potential CBRN casualties, and developing robust medical support plans to address these challenges effectively.

In summary, organizations, leaders, and medical planners must encourage and embrace the integration of high-quality medical planning into every operation. Leaders must recognize the potential impact of CBRN environments and casualties in future conflicts. By prioritizing training and readiness for CBRN threats, integrating medical considerations at all levels of planning, and emphasizing the importance of medical operations from basic Soldier skills to operational and strategic levels, the Army can enhance its overall readiness and increase the likelihood of successful mission outcomes while minimizing the impact of casualties.

Capt. John Gigante is a Medical Service Corps officer currently participating in an Army medical department long-term health education and training program, enabling him to complete a Master of Public Health at the University of South Florida in Tampa. He served in a Stryker brigade combat team in a brigade support medical company, has been a brigade medical operations officer in the 82nd Airborne Division, and most recently was a Company Commander in the 82nd Airborne Division in the division sustainment support battalion. Gigante has completed the medical operations course at Fort Sam Houston, Texas, the Basic Airborne Course, and is an Expert Field Medical Badge holder.

Army Invests in Logisticians with Industry-Based Broadening Opportunity

■ *By Retired Col. Mark Susnis*

In today's ever-changing and unpredictable world, the DOD recognizes the need and value of leaders who can think strategically to solve complex national security problems. As highlighted in the 2022 National Defense Strategy, Secretary of Defense Lloyd Austin emphasizes the importance of continuous learning and investing in developing DOD talent — the military and civilian professionals who will be the keys to success. One avenue through which these leaders are educated and grown is the Industry Based Broadening (IB2 LOG) Strategic Broadening Seminar (SBS), a world-class program offered by the Institute for Defense and Business (IDB), a nonprofit educational institute based in Chapel Hill, North Carolina.

Program Overview

The IB2 LOG SBS program provides officers, warrant officers, senior NCOs, DOD civilians, and private sector participants with a unique

opportunity to broaden their perspectives by exposure to what private industry is doing in critical areas, including data, technology, innovation, artificial intelligence, continuous process improvement, and overall organizational culture. IB2 LOG participants attend a two-week residency in North Carolina, where they engage in intensive learning and collaboration. The program also focuses on enhancing leadership skills, understanding complex security environments, and fostering critical and creative thinking.

Problem Statement and Collaborative Approach

Before attending the program, participants prepare a problem statement related to an essential, problematic issue within their organization or one that requires attention to move the organization toward increasing readiness, reducing costs, or improving performance. Upon arrival, program participants are placed in teams centered around common problem statement themes such as maintenance programs, supplier distribution, data flow, and total asset visibility. Participants refine their problem statements throughout the program through group work, drawing upon knowledge from speaker sessions, presentations, and field trip industry visits. This collaborative approach allows individuals from diverse backgrounds and ranks to contribute unique insights and foster a spirit of teamwork to develop strategies and courses of action to address the identified problem.

In today's ever-changing and unpredictable world, the DOD recognizes the need and value of leaders who can think strategically to solve complex national security problems.

Curriculum and Industry Engagement

During the first week of the residency, participants engage in academic-led sessions designed to challenge their thinking and broaden their knowledge. IDB's flexibility as a nonprofit organization enables collaboration with esteemed institutions and industry leaders. These sessions cover various relevant topics, including innovation, data visualization, and business communications. Industry partners share their insights, providing private sector perspectives not typically found in traditional military education. The program also benefits from a strong alum network, with previous participants sharing their experiences and lessons learned, reinforcing the practical applicability of the program's teachings.

Industry Visits and Real-Life Examples

In the program's second week, participants visit diverse companies across central and eastern North Carolina, ranging from small enterprises to Fortune 500 corporations. These visits provide invaluable insights into private sector operations, innovation, and challenges. For example, participants may learn about predictive maintenance and supply chain optimization through artificial intelligence. Other visits showcase the power of a culture of innovation and employee-driven initiatives in improving efficiency and leadership at all levels.

Culmination and Leadership Perspectives

The program concludes with small group presentations to a panel of esteemed leaders from the private and public sectors. These panels feature influential figures, such as senior DOD officials and industry executives, who provide feedback and engage in a dialogue with the participants. The presentations draw upon the knowledge gained throughout the program, emphasizing innovation, culture change, data utilization, and the role of artificial intelligence in addressing complex supply chain and logistics challenges. The panel discussions inspire fresh ideas and encourage critical thinking, preparing participants to tackle future warfare demands effectively.

Group photo of the Industry Based Broadening: Logistics seminar participants at Amazon's automated fulfillment center in Garner, North Carolina, on April 19, 2023. (Photo by Jennings Dixon)

Conclusion

Investing in innovative and adaptable leaders is crucial in an increasingly complex world. The IB2 LOG SBS, offered by the IDB, equips officers, warrant officers, senior NCOs, DOD civilians, and private sector participants with the necessary tools and networking opportunities to navigate tomorrow's challenges. By embracing change and fostering collaboration, the IB2 LOG SBS ensures the DOD remains prepared and ready to face the evolving landscape of the decisive decade. In developing the next generation of leaders, IB2 LOG SBS embodies the philosophy of focusing energy on building the new rather than fighting the old.

Retired Army Col. Mark Susnis serves as a Program Director at the Institute for Defense and Business in Chapel Hill, North Carolina. He was commissioned as a lieutenant of the Transportation Corps. He has a Master of Arts in leadership and management from Webster University, Missouri, and a Master of Arts in strategic studies from the U.S. Army War College.

Feature Photo
Dr. Jeff Camm, Academic Director - Center for Analytics Impact, Inmar Presidential Chair in Analytics, Wake Forest School of Business, meets with an Industry Based Broadening: Logistics small group during a practical exercise on telling a story with data on April 24, 2023, in Durham, North Carolina. (Photo by Jennings Dixon)

Data Modernization for HR Professionals

By Maj. Brian T. Johnson and Maj. Jeffrey T. Wilson

"Our Army is transforming, and so is our AG Corps. This is our opportunity as HR experts to evolve our functions and operations to best serve our People as we transform to a technologically modernized Army. HR functions are the forefront of our People First priority and what we do directly impacts the care of our People and Army readiness. We are charged with becoming better innovators, technicians, and HR experts ready to lead and advise our commands to win on and off the battlefield."

Chief Warrant Officer 5 Yolondria S. Dixon-Carter, Senior Warrant Officer Advisor to the 40th Chief of Staff of the Army, as quoted in Defend and Serve: The U.S. Army Adjutant General's Corps Strategy, 2022-2035.

The Adjutant General (AG) Corps is a professional military and civilian workforce that provides the Army's human resource (HR) services across the Total Army People Enterprise. With the arrival of the Integrated Personnel and Pay System—Army (IPPS-A), the HR community has a modernized system to support talent management, military pay, and readiness in an innovative, responsive, and data-centric way. The Army's technical capabilities in collecting, storing, and disseminating data have increased dramatically over the last two decades. The capabilities of personnel to effectively use data have not developed at the same rate, giving rise to a gap between analytic competencies and technical capabilities, which will only widen if not addressed. A highly skilled, certified, and credentialed HR workforce must match HR systems' demands, modernization, and innovation.

Identifying Areas of Concern

The Secretary of the Army has identified a requirement for the Army to be more data-centric, and the Adjutant General School (AGS) is prepared to meet that requirement.

In a world where recruiting efforts are down, the civilian population is focused on a better work-life balance, and tools are advancing rapidly. How do HR professionals modernize the force to meet the needs of potential, current, and future veteran servicemembers? AGS is transforming how it conducts data literacy to impact these efforts.

Technology can provide impressive speed and access to data and ease the cognitive workload. Modernizing HR services through IPPS-A requires HR professionals to be competent with technical and analytical skills. As the Army becomes more data-centric, HR professionals must possess the know-how to maximize the HR tools and provide data-driven recommendations to aid decision-making.

However, Soldiers and civilians usually do not have the educational background to work with and utilize the data they have. Army training and educational programs have not kept pace with emerging data requirements, modernization of military systems of record, and data-centric analysis of real-time data to make better-informed decisions.

Concerning data education, the Army's military and civilian education system must remain responsive and relevant. The AG Corps professional military education (PME) system must evolve to take advantage of the capabilities of IPPS-A and to be more responsive and relevant to the needs of the current and future operational environment. The current appetite for data-driven analysis requires HR professionals to quickly organize and present information to decision-makers to describe the current readiness situation.

Planning the Way Ahead

HR support relies on an HR professional's ability to utilize the four types of data analytics:

- **Descriptive.** HR professionals need to gain an understanding and quickly organize and present data to make data-informed decisions.
- **Diagnostic.** They must be able to diagnose what happened and why, using readiness trends and causal and correlational analysis, drawing on data, and organizing information depending on their purpose.
- **Predictive.** They must be able to model data to predict and forecast future requirements, enabling an agile response to rapidly shifting environments.
- **Prescriptive.** They must possess analytical competencies and skills to prescribe optimal recommendations for interrelated effects.

The AGS at the Soldier Support Institute at Fort Jackson, South Carolina, has implemented data education that is sequential and progressive in its approach, embedded in PME courses for its enlisted, noncommissioned, commissioned, and warrant officers. This approach expands existing PMEs to help modernize their efforts into empowering HR professionals, which directly ties in with maximizing the utilization of IPPS-A.

Bumps in the Road

The AG Corps must foster data analytic skills and proficiency across the HR workforce. This approach should be multi-tier, establishing, delivering, and sustaining a data-centric culture at all levels from the top down. Successful integration —

A highly skilled, certified, and credentialed HR workforce must match HR systems' demands, modernization, and innovation.

not just data, but data analytics — is necessary to ensure momentum generated by IPPS-A, and successful usage of HR systems is necessary to provide commanders with decision dominance rooted in data-centric decision-making.

This practical approach combines academic skills with Army warfighting function (WfF) requirements. The applicability and relevancy of training are keys to getting buy-in from the overall HR workforce and fostering a more data-centric, focused, and skilled community. The training relevance is tied to their current work and enables them to be successful when they leave the Army. The blend of academic and WfF training sets up these HR professionals to be successful in and out of the force because of the Army, as the relevance of data education is not limited to just within the Army. It could be argued the Army is catching up to practices in the civilian sector. Utilization of knowledge, skills, behaviors, and preferences is instrumental in identifying and cultivating exceptional HR professionals, connecting them with the right opportunities to develop HR professional data specialists.

The Road So Far (Data Literacy)

HR professionals are familiar with data. Data has been and continues to be a core concept of the profession. Previously, the reliance was on individuals understanding and applying data analytics. Across the force, this results in different understandings of what data is, what it means, and what to do with it. Focusing instruction creates a standardized approach to learning and applying fundamental data analytic skills, minimizing potential gaps in data literacy, management, analytics, and visualization skills.

New junior enlisted Soldiers enter the military and receive job training at advanced individual training (AIT). AIT Soldier instruction is at the descriptive level, or simply understanding what happens. As these Soldiers advance in their careers and return to Fort Jackson for the Advanced Leader Course (ALC), they prove they are invested, successful, and looking toward the future. Their instruction looks at understanding why things happen, including looking at second- and third-order effects and making recommendations on moving forward based on data rather than intuition. Finally, those attending the Senior Leader Course (SLC) have the tools to understand what happens and why it happens and make predictive data-centric decisions. Within AGS, the goal is to give them tools to look at trends to determine what is about to happen before it escalates into a predicament and make recommendations to mitigate risk or increase success.

Teaching data analytics focuses on identifying basic concepts and then building and expanding in increasing terminology, tools, and presentation levels. The basic building blocks of the current instruction focus on five levels: Excel, data terminology (qualitative versus quantitative), tools (VBA, Macros, SQL, Power BI), visualizations (Tufte, Gestalt, Freytag), and data storytelling (final presentation).

The Road Ahead (AGS Data Education)

AGS is continually defining and revising the data education curriculum. The end state is to teach standardized education from AIT to the Captains Career Course (CCC) and every level in between. While the Army identifies the proponent for common core data literacy, AGS is forging ahead with data education, for those who wait for others are doomed to get left behind.

The data education modernization efforts are broken down here. The backbone of IPPS-A is Microsoft's Power BI; much of the training is in that environment.

- Day zero includes an introduction to Excel functionality (8 hours E6+; 4 hours AIT).
- ALC (introduction) and SLC (data storytelling) students receive a one-day program (8 hours).
- Warrant Officer Basic Course (visualization) and Basic Officer Leader Course (general overview) students get a one-day program (8 hours).
- CCC students get a four-day program (32 hours).
- CCC students get one day of instruction on intermediate data analytics (8 hours), followed by three days of creating a dashboard in Power BI and IPPS-A.
- Warrant Officer Advanced Course (WOAC) students continue and get a two-day program (16 hours).
- Post-WOAC warrant, once a year.
  - Advanced Business Analytics Course (ABAC) at the University of South Carolina (four weeks).
  - Training With Industry (TWI) at Deloitte for one year.
  - Two-year utilization to teach data literacy at AGS.

Warrant officers, as the technical experts, are proposed to take over and continually refine data education within AGS after the completion of ABAC and TWI. Those two experiences and a vetting process before selection ensure the right people are being hired to maximize efforts to educate HR professionals in data education fully.

Comprehensive data education is not about the position or individual but a holistic effort of the team. Using standardized education, experienced personnel, and shared experiences (within a shop/section and at echelon left, right, up, and down), AGS is prepared to maximize HR professionals' capability and skill sets.

Conclusion

As the Army advances in the 21st century, the tools are expanding from Excel to IPPS-A and Power BI, so the HR professional workforce must also modernize. Given the dynamic environmental demands and requirements of Army HR professionals to quickly organize and present information, describe current readiness situation, make predictions for future endeavors, and make data-informed decisions, investment in people must match the investment in HR systems.

The AG Corps' challenge to defend and serve represents an enduring commitment to the Army's mission and people. This becomes increasingly more challenging when the Army conducts operations in uncertain and contested environments and requires more resources during an era when the Army is being asked to reduce its resource usage. The Army's investment in materiel modernization must be matched by an investment in its people.

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Sustainment Support

Quality Assurance Team Helps Keep Army Pre-Positioned Stocks in High State of Readiness

By Kevin Grimm

The 405th Army Field Support Brigade (AFSB) is assigned to the U.S. Army Sustainment Command (ASC) and, under the operational control of the 21st Theater Sustainment Command, U.S. Army Europe and Africa. The brigade is headquartered in Kaiserslautern, Germany, and provides materiel enterprise support to U.S. Forces throughout Europe and Africa, providing theater sustainment logistics; synchronizing acquisition, logistics, and technology; and leveraging U.S. Army Materiel Command's materiel enterprise to support joint forces.

The 405th AFSB's Army Prepositioned Stocks-2 (APS-2) mission is resourced in part through the Enhanced Army Global Logistics Enterprise (EAGLE) program, which provides the contractor workforce needed to meet the Army's APS-2 logistical support service requirements in Europe. Contracting officer representatives, in turn, oversee and ensure these contracted requirements are met.

Herbert Gately, chief of quality assurance (QA), Army Field Support Battalion-Mannheim (AFSBn-Mannheim), 405th AFSB, says QA representatives at the Coleman APS-2 worksite in Mannheim, Germany, play key roles in EAGLE contract oversight. Working onsite with government-contracted maintainers and logistics personnel, the QA specialists help ensure the APS-2 equipment is received, stored, maintained, modernized, and operationally configured within the contract scope to meet the requirements set forth by ASC and the Army.

At the Coleman worksite, this currently includes nearly two armored brigade combat team's (ABCT's) worth of APS-2 equipment, such as M1 Abrams main battle tanks, M2 Bradley fighting vehicles, and M109 Paladins, plus tactical wheeled vehicles, material handling equipment, generators, command and control communications equipment, basic issue items, and more. Later this year or early next, one ABCT's worth of APS-2 gear is scheduled to move to the newly opened APS-2 worksite in Powidz, Poland, the Long Term Equipment Storage and Maintenance Complex.

The AFSBn-Mannheim QA team is staffed by Department of the Army Civilian employees and rotational, contingency Army Expeditionary Civilian Workforce deployed civilians with collective experience in QA, quality control, contracting, maintenance, supply, and transportation disciplines.

QA Team Objectives

The AFSBn-Mannheim QA team is tasked to ensure onsite contractors are accomplishing all care of supplies in storage work tasks (COSIS). This includes equipment maintenance, logistical support property accountability, and equipment issue in accordance with the contract's performance work statement, the QA surveillance plan, onsite standard operating procedures, APS and maintenance policies, and best practices in the management of the program.

Specific Tasks and Key Methods

QA specialists perform three tasks: observe, document, and report. Key methods used by the Coleman QA team involve sampling contractor work orders based on workload, following quality trends, quality history, mission requirements, and non-compliance reports. These methods also include observing the contractor's performance in the management of contract data, including executing Global Combat Support System-Army (GCSS-Army) maintenance and supply tasks, ensuring modification work orders completed by the contractor are inspected and applied on site, and documenting this in the Modification Management Information System (MMIS). They also review equipment presented to the QA office in MMIS to ensure safety message completion and documentation.

QA specialists ensure APS-2 equipment is repaired to Army standards and ready for use by observing contractor completion and performance of all test, inspection, and sustainment maintenance tasks.

Equipment accountability is another crucial mission when it comes to APS-2 readiness. The QA team helps oversee contractor-managed equipment and materials inventories, ensuring accountability and availability for issues through periodic sensitive item and cyclic inventories, physical security inspections, and supply audits using GCSS-Army.

Safety and security are paramount for all Army and contracted personnel at the Coleman APS-2 worksite. One of the missions of the AFSBn-Mannheim QA team is conducting daily walkthroughs while observing contractor ground guide procedures, use of personal protective equipment (PPE), periodic evaluation of equipment load tests, reviews of occupational health standards, and audits of APS-2 tactical wheeled and heavy tracked vehicle operator's training programs.

To further complement Coleman's worksite safety program, senior Army and contractor project management staff conduct weekly quality and safety walkabouts — the purpose being to visit the different work areas and offices and talk to employees about safety and quality. This allows employees at the ground level to voice their concerns and improvement ideas directly to management, fostering personal responsibility and ownership of the safety program.

The QA specialists at the Coleman APS-2 worksite also ensure hazardous material (HAZMAT) is documented, stored, issued, and disposed of per Army and host nation policies. This includes the placement of HAZMAT labels, use of HAZMAT safety data sheets, employee use of PPE, appropriate segregation of onsite corrosive and flammable items, and availability of fire suppression systems and devices, plus all the appropriate onsite certifications and training requirements for environmental safety and health personnel and leadership.

Recently, the QA team at the Coleman APS-2 worksite coordinated with other organizations within U.S. Army Europe and Africa to redistribute excess packaged petroleum products, which is considered HAZMAT. Redistribution and reduction of disposal costs for these products will reduce operational costs.

Coleman APS-2 worksite QA specialists ensure APS-2 stocks are stored and issued within the COSIS service schedules, extending equipment shelf life. In addition, aggressive monitoring of high-value COSIS priority group items, implementation of Integrated Logistics Support Center corrosion prevention programs, and observance of ASC Packaging, Storage, and Containerization Center guidance are strictly followed.

In the future, the AFSBn-Mannheim team of QA specialists and the cadre of contracting officer representatives will continue to work together to provide the critical oversight needed to maintain the readiness of APS-2 while expanding the team's role in the oversight of emerging onsite equipment modifications and fielding.

The Coleman APS-2 worksite is located on a former Army airfield. In August 2021, U.S. Army Europe and Africa announced it would retain the Coleman worksite, which was previously scheduled to be returned to the German government.

The 405th AFSB's APS-2 program provides turnkey power projection packages ready to deploy at a moment's notice while helping to reduce the amount of equipment needed from the deploying forces' home stations. APS-2 sites like Coleman help reduce deployment timelines, improve deterrence capabilities, and provide additional combat power for contingency operations. APS-2 equipment may also be drawn for use in training and exercises.

For more information on the 405th AFSB, visit the official website at www.afsbeurope.army.mil and the official Facebook site at www.facebook.com/405thAFSB.

Kevin Grimm currently serves as a quality assurance specialist for Army Field Support Battalion-Mannheim at Coleman APS-2 worksite in Mannheim, Germany. He is also an Army Expeditionary Civilian Workforce employee deployed to Germany from Aberdeen Proving Ground, Maryland, where he is assigned to U.S. Army Communications-Electronics Command.

Feature Photo
Marc Bourdeau, an Army Expeditionary Civilian Workforce (AECW) employee with the 405th Army Field Support Brigade, conducts a basic issue item inventory on an M113 Armored Personnel Carrier at the Coleman Army Prepositioned Stocks-2 worksite in Mannheim, Germany, July 18, 2023. Bourdeau is a quality assurance specialist with Army Field Support Battalion-Mannheim while on AECW status, but his regular job is located at Tobyhanna Army Depot, Pennsylvania. (Photo by Kevin Grimm)

P WEEK Methodology

The "P"referred Menu Option for Field Feeding Training Plans

By Capt. Lauren M. VanDerLugt

The green-amber-red cycle is the most common time management system used in the Army. However, there are more effective systems for companies where platoons and teams are on different training cycles. Instead, the P Week methodology is ideal for a logistics commander describing the capabilities, requirements, shortfalls, risks, and opportunities for platoon and team-level training periods to higher commanders. Commanders can quickly analyze requirements based on a unit's personnel and equipment readiness and communicate mission feasibility and risks. Since the creation of the quartermaster field feeding company (FFC), commanders have struggled to manage maintenance and training while balancing the companies' garrison operations and inadequate manning. Consequently, FFC commanders should choose the P Week methodology for quarterly training planning and execution.

Doctrine

According to Field Manual 7-0, Training, P Week methodology is "a prescriptive system that codes certain activities in certain weeks, forcing commanders to account for other requirements such as recovery from training and training preparation. P1 equals a unit's prime time training window, P2 equals Recovery window, P3 equals Training Preparation window, and P4 equals Offline window with no training authorized (red cycle, block leave)." The P Week methodology helps commanders determine the weeks for concentrated training, recovery, preparation, and leave.

The FFC has two primary missions: a field training or deployment mission and a garrison mission. The field training/deployment mission requires the company to provide field feeding to units that are echelon above brigade. The garrison mission requires the company to maintain operational control of installation warrior restaurants, conduct arrival/departure airfield control group support, and augment culinary outpost kiosks and food trucks. The FFC includes a headquarters team that manages mission command, training, maintenance, and administrative operations. The company also has two platoons: one platoon headquarters and four field feeding teams. Each field feeding team has 15 culinary specialists: one culinary management NCO, one advanced culinary management NCO, four culinary NCOs, and nine culinary specialists. Each platoon has two assault kitchens that can feed 150 personnel to support smaller sites. Each field feeding team has four medium tactical vehicle variants, two mobile kitchen trailers (MKTs), two water trailers, and two food sanitation centers that can feed a maximum of 700 personnel.

Implementation and Impacts

The 115th Quartermaster FFC within the 4th Infantry Division operated a warrior restaurant, kiosk, food truck, and Basic Leader Course warrior restaurant. It provided expeditionary field feeding to field training, such as the Combat Training Center, training exercises, best medic competitions, and deployment missions, like an immediate response force.

Each unit must modify the P Week methodology to their company's base support requirements. The best method is to assign field feeding teams a mission, such as expeditionary field training, garrison operations, or deployment mission, for an entire quarter, which helps commanders conduct mission analysis on personnel, equipment, and training.

The P Week methodology defines personnel capabilities and provides personnel predictability and purpose. First, commanders define teams as full or partial based on personnel deployability, which outlines their capability to provide support. As standard operating procedure in the 115th Quartermaster FFC, full teams were defined as 80% manned, and partial teams were defined as 46% manned. Once the battalion sends the company the requirement, the commander provides feedback on the ability to support based on the personnel available in the team. Secondly, the P Week methodology gives Soldiers and leaders predictability and purpose. Soldiers see when they will get time off, their assigned mission set and duration, and the windows for preparation and recovery. Platoon leaders and platoon sergeants can backward plan training based on the same factors. Also, the field-feeding teams build relationships, trust, cohesion, and competence through mission repetition. Lastly, a recommendation to maximize the benefits of this methodology is to maintain team integrity, which increases trust and cohesion based on the hardship, resiliency, and growth during mission execution. This approach enables junior leaders to take on more leadership roles and teach and coach other junior Soldiers.

Soldiers from 4th Sustainment Brigade, 4th Infantry Division, along with Soldiers from throughout the Ivy Division, utilize the field dining area Oct. 1, 2020, to eat their breakfast while following the COVID-19 restrictions. (Photo by Sgt. James Geelen)

Commanders can determine and communicate support based on the unit's equipment readiness. A commander must review the equipment readiness of each team to assess their capability to support each requirement. For instance, a specific team may only have one MKT and can only feed a maximum of 350 personnel instead of 700 personnel with two MKTs. Additionally, the review allows commanders to identify equipment that is not mission capable, prioritize maintenance, request Class IX parts for equipment repair, and communicate risks to the mission if equipment readiness does not improve before mission execution.

The P Week methodology clearly outlines what training will occur throughout the quarter. It facilitates the platoon leadership's ability to execute the 8-Step Training Model. At the beginning of the quarter, the platoon leadership must know their field feeding team's mission to train, resource, prepare, execute, and recover personnel and equipment. Additionally, the commander can communicate training changes and risks to the mission due to unforeseen support requirements.

Conclusion

For FFCs, the P Week methodology is more effective than the green-amber-red cycle time management planning system. Many logistics units train at the platoon or team level with different training glide paths, and the P Week methodology gives FFC commanders effective ways to depict, plan, and communicate training proficiency and readiness. Additionally, the P Week methodology helps commanders protect their units' nonduty hours, operationalize maintenance, increase resourcing time, and forecast shortfalls.

Capt. Lauren M. VanDerLugt currently serves as the support operations materiel management branch chief of the 4th Division Sustainment Brigade at Fort Carson, Colorado. She previously served as the company commander of the 115th Quartermaster Field Feeding Company, 4th Division Special Troops Battalion, at Fort Carson. She has a Bachelor of Science in chemistry from Washington State University.

Feature Photo
Sgt. Danielle Walker, a culinary noncommissioned officer, assigned to 115th Quartermaster Field Feeding Company, 68th Combat Sustainment Support Battalion, 4th Sustainment Brigade, 4th Infantry Division, serves meals to Soldiers during field training at Fort Carson, Colorado, Aug. 22, 2022. (Photo by Spc. Brenda Salgado)

CONTRACTING MASTER GUNNER PROGRAM DEVELOPS TRAINED, READY ACQUISITION PROFESSIONALS

By Sgt. Maj. Lloyd Cueto and Master Sgt. Payten Redfearn

Sustainers have never had a master gunner of their own until now. At the sound of the term or the sight of the phrase master gunner, a traditional Army Soldier envisions a senior NCO at the helm of a training exercise, steering the organizational readiness to operational vigilance. A contracting master gunner is no different. Rather than weapons systems and battle drills, the contracting master gunner readies the force to achieve mission success with technological acquisition systems and rehearses reactionary measures to overcome challenges in the area of operation. Among the NCOs in a formation, the contracting master gunner stands out with a significantly higher depth and breadth in contracting execution and contracting support. As the backbone of the Army, NCOs absorb the immediate internal effects during each step the organization takes toward mission success.

Above all else, the training completed and designation earned by a master gunner empowers the NCO to advise commanders and impact the organization with expert tactical knowledge. The insights a master gunner provides mesh the ground truth of the mission with the command team's guidance and direction to synthesize a course of action with all variables considered. Contracting operations adapt and evolve as operational and mission variables shift in the complex environment during crises, conflict, and competitive events. As such, contracting units must align their focus and effort on the critical gaps of logistics and organic support to provide commercial contracting solutions to the other warfighting functions.

The Army Contracting Command (ACC) is committed to delivering optimal performance in commercial support for military operations by implementing effective methods for operational contracting support. At the operational level, contracting support brigades (CSBs) and contracting centers provide joint, interagency, intergovernmental, and multinational support for the six warfighting functions. The ACC has CSBs, typically composed of geographically dispersed contracting battalions and contracting detachments, to deliver solutions through aligned support to a theater Army, field Army, and Army Corps. Each brigade executes theater support contracts, administers external support contracts, and coordinates systems support contracting in conjunction with other sustainment enterprise partners.

In 2015, then Col. Douglas Lowrey and Command Sgt. Maj. Rocky Carr of the 409th CSB developed the Contracting Master Gunner program to address the challenge of objectively measuring a contracting professional's technical readiness at an individual level. The program fills a critical gap in measuring individual technical readiness, which is difficult without an expert in all weapon systems. Contracting professionals' weapon systems are crucially situated at the intersection of logistical needs and commercial capabilities, making it imperative to develop a program focusing on individual technical readiness led by contracting weapon systems experts. Initially, the command team selected and trained members of the Fighting 409th CSB as contracting master gunners to validate individual technical readiness throughout all echelons of their organization. Its success prompted the program's ideas to be expanded to other contracting organizations throughout the Army. Lowrey, now a brigadier general and the Mission and Installation Contracting Command (MICC) commanding general (CG), prioritized bringing the program to an enterprise level. As a result, a handful of select NCOs redesigned the Contracting Master Gunner program over several months, building upon the original program executed by the 409th CSB in Germany. The MICC CG selected these NCOs based on their performance and technical expertise in contracting support and Army operations.

The current Contracting Master Gunner program also aims to validate technical expertise through course material focused on the tactical execution of contracting support efforts. The MICC at Joint Base San Antonio-Fort Sam Houston, Texas, hosts the course twice a year. For continuity, the original instructors have continually assessed the performance and input alums brought to the development

The commanding general and command sergeant major take a picture with the graduating students of the Contracting Master Gunner Class 22-02. From left to right, top to bottom: Master Sgt. Judith Rocha, Sgt. 1st Class Anuresh Chand, Sgt. 1st Class Angela Kim, Sgt. 1st Class Paul Gaeth, Staff Sgt. Cameron Wade, Staff Sgt. Scott Sieck, Sgt. Major Lloyd Cueto, Staff Sgt. Ryan Morris, Staff Sgt. Johnathan Robbins, Sterlyn Frazer, Brig. Gen. Doug Lowrey, Command Sgt. Maj. Jason Gusman, Sgt. 1st Class Jacob Sanders (honor graduate), and Sgt. 1st Class Sterling Alphonse. (Photo by Ryan Mattox)

of the program. The top performers from previous classes train and certify as instructors and facilitate future iterations of the course.

Command teams nominate and submit their prospective students for consideration. Course administrators select students based on experience and knowledge; not everyone gets selected or passes the course. Each course is two weeks long with nine days of instruction and three culminating events: a written test, an external evaluation design brief, and a proposed unit training strategy brief. When creating their unit training strategy, the students take their commanders' real-world training priorities and upcoming missions to develop a strategy for the next year of events.

Today, contracting master gunners are in every CSB and several contracting centers in the Army. They are crucial in advising commanders on contract execution and contracting support. They also identify everyone's technical and experiential deficiencies and formulate an approach to enhance both by advising command teams on training opportunities. The Contracting Master Gunner program has been instrumental in identifying and addressing knowledge and experience gaps in the contracting workforce. The program provides training and support to contracting officers, contracting specialists, and other members of the contracting workforce. This includes training on relevant topics such as the optimal use of contracting systems, commercial industry trends, contracting regulations, procurement procedures, data analytics, and organizational management and readiness. Insights made available by a contracting master gunner to a command expedite contracting solutions to complex problems.

Furthermore, the program has improved contracting support's overall efficiency and effectiveness. By identifying individual technical deficiencies, contracting master gunners develop individualized training plans that address specific knowledge gaps. This tailored approach to training is highly effective in improving individual technical readiness, ultimately leading to enhanced contracting support performance through increased organizational competence, capacity, and capabilities. The results are clear: increased individual technical readiness increases organizational technical readiness and ensures contracting organizations remain vigilant to support military operations worldwide.

The Contracting Master Gunner program has also supported the Army's mission to modernize its contracting processes. As the Army seeks to modernize its contracting systems and processes, the Contracting Master Gunner program has been instrumental in ensuring contracting professionals are trained and prepared to operate within these new systems. This includes training on new contracting technologies, such as electronic procurement systems and data analytics tools. Beyond the traditional data query to identify executed stats and pending actions, contracting master gunners analyze data to provide the foresight to prescribe the best courses of action to overcome upcoming challenges. They accomplish this by implementing tactical shifts to address strategic issues. By way of the master gunner alum network, commanders can prompt their local master gunner with a problem set and receive a collective response from the entire network. Not only does the commander receive a custom solution, but the body of knowledge in the network increases. The increased exposure to global concerns aids in the continuous development of contracting professionals in alternate locations.

Finally, the Master Gunner program fosters and enforces a culture of continuous improvement within the contracting community. By emphasizing and energizing the importance of individual technical readiness, the program instills a sense of responsibility and persistence among contracting professionals to pursue advancements in their knowledge and skills. As Soldiers and civilians prepare for upcoming missions and deployments, they can tap into a knowledge repository of trained professionals with the charge to guide and mentor those contracting professionals to victory. This has resulted in a contracting workforce that is more proactive in seeking out training and development opportunities, which has led to improved overall readiness and effectiveness.

In conclusion, the Contracting Master Gunner program has been pivotal to the Army's contracting operations, ensuring trained and prepared contracting professionals support the dynamic and complex challenges of the field. As ACC and the acquisition process continue to evolve and adapt to new challenges, the Contracting Master Gunner program exemplifies the importance of innovation and adaptation in ensuring the Army remains ready to support and sustain military operations worldwide.

Sgt. Maj. Lloyd Cueto currently serves as the operations sergeant major for the Mission and Installation Contracting Command. He previously served as the contracting support plans and operations NCO in charge of the 414th Contracting Support Brigade. He is a doctoral candidate through a Doctor of Business Administration from the University of the Incarnate Word.

Master Sgt. Payten Redfearn currently serves as the G-3/5 (Strategic Concepts) NCO in charge for Army Contracting Command. He previously served as the senior enlisted advisor for the Theater Contracting Center — Southwest Asia. He has completed all levels of the Non-Commissioned Officer Education System through the Master Leaders Course. He has a Master of Business Administration from Post University, Connecticut.

Feature Photo
Nine Soldiers and civilians compete against each other in the Mission and Installation Contracting Command's (MICC'S) 51C Master Gunner Course (MGC) April 4-15 at Joint Base San Antonio-Fort Sam Houston, Texas. Using a combination classroom and online setting, the MICC MGC is a competition used to evaluate the technical expertise of the command's contracting workforce and validates contracting professionals capable of deploying and operating independently, as part of contracting detachments, as well as part of mobile contracting teams. (Photo by Sgt. 1st Class Terry Ann Lewis)

Artificial General Intelligence in 5 Not-So-Easy Steps

By Capt. Jon Cariba Phoenix

The best lens through which to view today's artificial intelligence (AI) is the late 1990s/early 2000s dot-com bubble. Chattering elites exclaimed the poorly understood new technology (the internet) would change everything, and then the bubble, inflated by irrational exuberance, suddenly popped. Once the smoke from broken companies cleared, it became clear the internet did change a lot, but not everything. Dreams of online activism leveling the playing field crashed headfirst into a lack of know-how and difficulty sustaining digital worlds in real ones. Ironically, those who understood the limitations of the internet (namely, its privacy-eroding addictiveness) profited the most.

Today's AI is probably even less understood. Breathless chatter about ChatGPT masks the reality that AI is not as advanced as many think. It can suggest Paris for a destination vacation but miss ongoing protests that would crimp any honeymoon. It can tell a jewelry store owner that halving prices should sell unsellable bracelets but can't predict why a clerk accidentally doubling their price would make the bracelets sell out.

Why? Because AI is not artificial general intelligence (AGI), which is to say AI cannot think like a human. This inability is why AI fails at many jobs, particularly those involving novelty.

This raises the question: could AGI exist? To answer that, it is necessary to demonstrate what it would take to create it, spotlighting the differences between AGI and regular AI. AI will change a lot, but there are reasons it won't change everything.

An Expanded Memory

Starting in the 1980s, AI pioneer Judea Pearl gradually developed the idea of a ladder of causation separating human from machine reasoning. At the bottom is association, seeing which variable tends to be related to another variable. In the middle is intervention, observing how changing one variable affects another. At the top are counterfactuals, understanding what causes what and imagining what could have been otherwise. Babies are already born into the middle level, reaching the higher level as they mature. But animals and computers, Pearl said, remain at the lowest level. Why? While machines can run advanced statistical analyses on how A and B correlate, going from correlation to causation requires something else.

Enter do-calculus, a type of mathematics Pearl invented to provide that missing piece. It is brilliant in its simplicity: two or more dots with an arrow from dot A to dot B representing causality (A causes B). Do-calculus lets you start with a hypothesized dot-and-arrow causal diagram and mathematically modify it to show what correlations you could expect to see from it. You can then test whether your model matches your empirical data, even if the data wasn't collected from a randomized experiment. The result is AI's ability to create primitive structural causal models from essentially artificial experiments, solving many simple problems in the process. Yet, as Pearl noted, the subsequent spread of AI was not the result of AI discovering complex causal models but rather the number of seemingly complex tasks (like text prediction) that could be reduced into simple ones.

Pearl's do-calculus was a significant AI breakthrough, but there are reasons why it hasn't, on its own, created AGI. The diagramming is primitive, which limits the ability to integrate emerging causal models on more complex subjects. And yet, Pearl's causal modeling did capture one essential essence of human intelligence: a human brain contains around 86 billion neurons, which can encode billions of relationships.

Yet 86 billion is not infinite. This necessitates AGI's first ingredient, which is more memory. As sociologist Robin Dunbar notes, 86 billion neurons translate into enough bandwidth to give a typical human only six close friendships and around 150 acquaintances. A true AGI must be able to encode and synthesize at least as many causal relationships as a human (and ideally more), which is not the same as computer speed.

The Blank Attractor or the Rube Goldberg Nature of Human Cognition

Rube Goldberg was an early 20th-century cartoonist known for designing unnecessarily complex machines to perform simple tasks. A Rube Goldberg machine might cobble together some improvised solution to carry a ball from point A to point B. Similarly, there is a Rube Goldberg

Breathless chatter about ChatGPT masks the reality that AI is not as advanced as many think.

nature to human intelligence. Given a particular set of inputs and outputs, humans improvise a solution. If, while repairing your car, a screw drops into a crevice too small for your hand, you might look for something narrow enough to fit the crevice and something capable of moving the screw toward you. Several possible solutions result, such as a magnetic rod, a claw, or a long screwdriver to push the screw onto the ground. The solutions may not be elegant, but they all fill a niche.

A blank niche that attracts possible solutions is the second ingredient of AGI. Humans identify a gap, search through one's memory of causal relationships, and identify something that fills it. The improvisational aspect of this is what's most important here. Unsolved problems rarely have simple solutions. Rube Goldberg cognition is thus why people with a broader range of experience are more successful at creatively solving novel/complex problems, which points to two other limitations of today's AI: ChatGPT cannot autonomously query itself, and even with human input, ChatGPT's answers are becoming less flexible and less accurate over time.

Psychologist Peter Hobson notes human cognition emerges from a newborn interacting with other humans in its first 18 months. Could ChatGPT talking to itself improve its accuracy or create Rube Goldberg's cognition? Unlikely, and here's why.

Hyperbolic Discounting

Asked to choose between receiving $60 in six months versus $30 in three, most humans choose the larger/long-term reward. But the preferences reverse when asked to choose between $60 in three months versus $30 immediately. Psychologist George Ainslie termed this frustrating aspect of human cognition hyperbolic discounting: humans typically prefer larger or long-term rewards except when short-term temptations are offered instead. It's why New Year's resolutions often fail. Yet hyperbolic discounting has been found across animal species, including non-mammals. This begs the question, why would such an inefficient cognitive structure evolve?

According to Ainslie, the reason is simple. By turning human (and animal) minds into constant debates between various shorter- and longer-term selves, humans don't stagnate. Returning to the jewelry store example, hyperbolic discounting's debate between longer- and shorter-term rewards pushes the revision of the brain's dot-and-arrow diagrams when an unexpected event (doubling prices increases sales) clashes with received wisdom (lowering prices increases sales). In contrast, a mind using exponential discounting that always chooses the larger/long-term reward would have trouble shifting its behavior in complex environments, which is ChatGPT's current problem.

Like all computers, today's AI uses exponential, not hyperbolic, discounting and thus cannot revise its code unless programmed. This sharply limits the complexity of the problems AI can solve. Creating an AGI that transcends those limits would need hyperbolic discounting. But in the process, hyperbolic discounting would grant AGI the autonomy that today's computers lack. Imagine a machine not feeling like turning on.

Humility, Curiosity, and Artificial Spirituality

Humans have only one way to resolve their hyperbolic discounting debates without stagnating: by focusing on iteratively longer and longer time scales for each longer-term self-resolving problem from before. But how do humans maintain such a quest for the infinite, given a finite lifespan? The answer is many don't. Millions worldwide destroy their lives with short-term addictions, billions more stagnate by fixating on long-term idols (money, power, fame, ideology, etc.), and capitalism hobbles most of the rest through precarity. Diverse psychology research points out what happens next: learned helplessness and the need for certainty override the tolerance for ambiguity. The need for cognition (i.e., how much one enjoys thinking) plummets in the process.

So hyperbolic discounting drives humans to grasp for the infinite, but instinct is weak on its own. Granted, the scientific method exists for chasing infinity, but this evolved after organized religion colonized chasing infinity first. However, religious or meditative introspection alone could never reliably decipher the natural world without data-gathering and experimentation. This raises intriguing questions. If we created a hyperbolically discounting AGI, are we also creating an artificial personality or spirituality (things today's AI conspicuously lacks)? Could either be programmed to avoid humanity's mistakes?

Recent advances emphasize humility as a new sixth factor of human personality (along with emotionality, extraversion, agreeableness, conscientiousness, and openness). While hyperbolic discounting would suggest not programming a single personality across all AGIs, high humility and openness would be essential to bootstrap a quest for the infinite. Such a quest is necessary to optimize hyperbolic discounting but can only be sustained in a society that does not increase the precariousness of its members.

The Oneira Project

The above ingredients show how limited today's AI truly is and how far there is yet to go to create AGI. Few will likely follow these steps, making AGI only slightly more realistic a goal than medieval alchemy.

Yet Newton's alchemy research inadvertently fueled breakthroughs in other fields. To that end, the quest for AGI could lead to other more modest but useful advances. Perhaps new technology could expand human brainpower beyond Dunbar's limits. A more practical advance, however, would be a hypothetical fifth AGI ingredient with multiple applications outside of it.

Pearl's structural causal models are useful but primitive. His textbook describes his diagrams' difficulty processing feedback loops or changes over time. This is why humans use differential equations or spoken/written language to express more complex processes.

The problem is that differential equations have severe constraints, not quite capturing humanity's ability to visualize potential alternate worlds before they exist. Meanwhile, to paraphrase Steven Pinker, human language does act like an app, translating the brain's tangled web of memorized relationships into a linear form. But it's not efficient at it.

Can this be improved upon? Is there a way to create a machine language, a new type of causal calculus, or both that can capture complex systems in more detail than differential equations and structural causal models and yet more efficiently than human language? Such a tool could drastically improve an AGI's ability to visualize possible futures in a complex world. Let's just hope humans make better use of it first.

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Comparing Logistics Staff Officer Positions within UN, Army

By Maj. Joshua M. Lawrence

In October 2022, I received a Worldwide Individual Augmentation System (WIAS) tasker assignment while assigned to the Combined Arms Support Command as a training developer. These orders began a one-year assignment with the United Nations (U.N.) in Juba, South Sudan, a landlocked country in East Africa, which gained independence from Sudan and became a U.N. member state in 2011. Since gaining independence, South Sudan has been wracked by conflict and multiple civil wars, and there is currently a fragile peace agreement between the various armed groups. In 2011, the U.N. created the U.N. Mission in South Sudan (UNMISS) to establish and maintain the conditions for peace. Recent revisions to the mandate for UNMISS prioritize the protection of civilians, distribution of humanitarian aid, and the development of the newest nation in the world through support of the revitalized agreement and peace process and by addressing violations of humanitarian and human rights law. It was clear this would be an entirely different experience from past military deployments.

Becoming a U.N. Peacekeeper

Opportunities like these are exclusive, with fewer than 40 U.S. military officers serving as U.N. peacekeepers deployed worldwide from the Army, Marines, Navy, and Air Force. Many U.S. military members are unaware of these U.N. assignments and the opportunities they provide. I was assigned as a staff officer in the Joint Logistics Operations Center (JLOC) under the UNMISS Mission Support Division. However, basic skills and general knowledge must be learned before focusing on specific job positions as a U.N. peacekeeper. For this purpose, the U.S. Military Observer Group (USMOG) is responsible for training, equipping, deploying, and managing U.S. military members from across the joint force assigned to U.N. positions. The USMOG headquarters is in Washington, D.C., under Army G3/5/7. USMOG pre-deployment training consists of U.N. familiarization and mandatory training, the Evasion and Conduct After Capture course, and the Individual Terrorism Awareness Course. The time in training also provides individuals deploying as a team a chance to build camaraderie. The instruction gives U.S. military peacekeepers a basic organizational understanding of the U.N. and prepares them to operate as small teams in unstable mission areas.

U.N. Mission Organizational Structure

Although dissimilar to an Army theater-level command, the U.N. mission structure still involves strategic, operational, and tactical levels of operations. The strategic level, headquartered in New York City, consists of the U.N. Security Council, the U.N. Secretary-General, the U.N. Secretariat, and the Under-Secretary-General in charge of the Department of Peace Operations (DPO). Linking the strategic and operational levels is the head of mission or Special Representative to the Secretary-General (SRSG), supported by a politically focused special staff. The remaining operational-level components include the Office of the Director of Mission Support (DMS), which is responsive to the SRSG and provides support to the component heads of the U.N. Force headquarters and police. The tactical level of operations comprises a combination of military and police units and political entities with regional offices. The JLOC in the UNMISS mission falls under the office of the DMS and is separate from the military logistics staff section, the U4, of the force headquarters (FHQ). The DMS, FHQ, and Police are the primary operational components of UNMISS.

UNMISS Sustainment Mission

The UNMISS is a multidimensional peacekeeping operation comprising around 14,000 military, 2,000 police, and 2,000 civilian personnel headquartered in South Sudan's capital of Juba. Twenty field offices (FOs), company operating bases, and temporary operating bases (TOBs) are located throughout the country's ten states. The states are further organized into FHQ areas of responsibility of five sectors: North, East, West, South, Juba, and Unity. Each sector has a sector headquarters that manages the military and police units within the sector and a main FO in each state that manages the area engineering and logistics. The FO is the main sustainment node for the sector/state, with company operating bases being smaller long-term bases occupied by military, police, and civilian units and TOBs being short-term bases with only military and police units. These bases are positioned to provide support and protection to area

internally displaced persons (IDP) camps and protection of civilian sites. The U.N. mission provides multiclass sustainment to all these bases using finite transportation assets.

This concept does not differ much from the Army's use of forward operating bases as main nodes in an area, with company operating bases as smaller ancillary nodes for operations. Logistically speaking, this is comparable to the Army field trains concept, with the FO acting as the Army logistics support area, the company operating base as the brigade support area, and the TOB as the field, combat, and company trains. The main differences between the U.N. and Army logistics operations are the shared operations management by a military and civilian mission component, fewer available organic logistics capabilities, and an increased portion of sustainment missions conducted by contractors.

U.N. Mission Sustainment Capabilities

U.N. mission sustainment capabilities come from two types of equipment and property: U.N.-owned equipment (UNOE) and contingent-owned equipment (COE). UNOE is simply the equipment, materials, and infrastructure owned by the U.N. mission, and COE is equipment and self-sustainment capabilities deployed as part of the military and police contingent. These military and police contingents are referred to as troop or police contributing countries (TCCs/PCCs). The equipment, capabilities, and self-sustainment with which a TCC/PCC deploys are agreed upon in a memorandum of understanding (MOU) between the member state, the U.N. Department of Field Support, and the U.N. DPO. A committee can revise these MOUs to support any changes to the mission. Member states that provide a TCC/PCC to a U.N. mission receive monetary reimbursement for the COE they send to the mission. A standard table outlines reimbursement rates, and a series of inspections by the U.N. of the TCC/PCC COE is performed before, during, and upon mission completion to ensure the equipment remains operational and qualifies for reimbursement by the U.N.

Member state TCC/PCC COE equipment makes up most of the sustainment capabilities in the U.N. mission. The key COE sustainment assets are level I and II medical clinics, aviation assets, heavy engineer equipment, ground cargo and fuel transportation assets, field feeding equipment/kitchens, tentage, generators, water storage, and material handling equipment such as forklifts and cranes. The TCC/PCC COE also contains force protection assets and military patrol vehicles that allow sustainment operations freedom of maneuver. The challenge with having both UNOE and COE is simultaneously having the same equipment tasked for separate purposes. The TCC/PCC would claim the equipment belongs to them to support their operations, and the U.N. mission would claim COE is part of a fleet to support the entire mission, and mission-level requirements take priority. Likewise, a TCC/PCC may request UNOE items the mission presumes the TCC/PCC has as part of their self-sustainment capabilities per the member state MOU.

In the first few years of Operation Iraqi Freedom and Operation Enduring Freedom, it was standard for Army units to deploy with their home station equipment. Eventually, a fleet of military vehicles and common equipment called theater-provided equipment (TPE) was established, which allowed units to fall in on equipment already in theater. The planning and management of Army home station equipment and TPE in theaters of operation are like the relationship between COE and UNOE or the U.N. member state and the U.N. mission. The difference is the Army units deploying to theater were all part of the same parent organization and did not have to deal with the complexities of varying country-specific equipment and requirements independent from a central organization.

Use of Multimodal Transportation

The South Sudan operational environment comes with a variety of sustainment challenges. Localized conflicts and attacks on supply convoys to take food and other cargo are common occurrences. Also, the weather and its operational impact are less predictable, creating potentially more impactful challenges. South Sudan has very few road networks; most are unimproved dirt roads. The country has a distinct wet season with consistent heavy rains causing flash flooding and undrivable conditions for heavy transport vehicles.

To make matters worse, the mountains in the south channel rain and runoff into the flat plains located in the middle of the country. One of the places most impacted by this effect is Bentiu, a northern village in Sector Unity. The IDP camp at Bentiu was constructed in 2013, but the water level around the camp has risen yearly. At the end of the rainy season in 2022, the water level at Bentiu was nearly nine feet above the ground level of the camp. U.N. engineer units are constantly battling to repair, reinforce, and heighten dikes that stand around the entire perimeter of the camp. The non-trafficable conditions have led UNMISS to explore other modes of transporting supplies to its bases and distributing humanitarian items.

The primary mode of transport during the wet season is air. UNMISS has fixed and rotary-wing aircraft, but there are fewer than thirty aircraft and limited crew flight hours to service an area twice the size of Germany. The weather conditions of the wet season also present challenges for air transportation, with reduced visibility and fewer landing sites due to flooding and soft ground. Fortunately, the long-used mode of transportation of the White Nile River runs south to north through the middle of the country from Uganda to Sudan.

Before the country's separation from Sudan in 2011 and before UNMISS was established, the U.N. Mission in Sudan provided the required U.N. presence in Sudan and used the White Nile to transport humanitarian aid and supplies to the southern part of what was then Sudan. In 2014, UNMISS began using the White Nile again for the same purpose under the name Operation Lifeline, a barge convoy operation with dedicated marine force protection that transports vital supplies such as fuels, rations, and critical building materials along a 1,000-kilometer river voyage from the southern port of Mongalla to the northern port of Malakal. This is often one of the only methods to resupply the northern sector of the country and is a carefully coordinated effort between contractors, local barge captains, Bangladesh Force Marine Units, military liaison officers, supporting ground security elements, local governments, and mission support and force headquarters management.

One Operation Lifeline convoy movement can transport upwards of 1.5 million liters of fuel, 150 tons of rations, and 40 sea containers of additional materials or equipment. For comparison, the convoy delivers an amount of fuel equivalent to 125 flights or sorties by a Mi-26 heavy-lift helicopter, which would erode valuable flight hours and come at a much higher cost. Operation Lifeline is a continuous operation, with loading/unloading, maintenance, and travel time for one resupply convoy totaling around 45 days. UNMISS completes six to eight convoys yearly to resupply Sector North and facilitate UNMISS operations.

A material solution for ground transportation UNMISS is using to overcome the challenging environmental conditions in South Sudan is the SHERP all-terrain vehicle. The SHERP is a vehicle

Although dissimilar to an Army theater-level command, the U.N. mission structure still involves strategic, operational, and tactical levels of operations.

designed to negotiate rough, muddy, and soft soil terrains, and the specifically designed tire tread propels itself while floating in water. The World Food Program (WFP) began using SHERP vehicles to navigate the challenging terrain of South Sudan in 2019. After observing WFP's success with the vehicle, UNMISS began a vehicle test trial in the spring of 2022. UNMISS leased 15 SHERP vehicles and four trailers from WFP and entered into a maintenance agreement that utilized the existing WFP vehicle workshops in Jonglei State. The Indian Battalion stationed in Bor was selected to train and operate the SHERP vehicles and conduct the test trial. The test trials confirmed the vehicles could navigate short and long patrols, allowing the U.N. mission to project efforts to protect civilians and transport supplies if required. With the trial completed in September 2022, the force commander wanted to retain the current SHERP vehicles and acquire more. With massive flooding during the country's rainy season, the mission has struggled to maintain year-round mobility, and the SHERP vehicle has shown promise as that potential capability.

The primary roles of the UNMISS JLOC are tracking the performance, overseeing the maintenance of the SHERP vehicles, and participating in the renewal and negotiation of changes to the WFP vehicle lease contract. Distinctive Army sustainment concepts such as two-level maintenance responsibilities between the vehicle operator and the workshop, procedures, and enforcement of proper preventative maintenance checks and services, scheduled services planning, and estimating the amount of shop/bench stock parts to expedite repairs have all been novel concepts within the U.N. mission. To be fair, this is new at the mission level because heavy equipment and military vehicles are brought to the U.N. mission through TCC COE, which requires the TCC to bring supporting maintenance assets. The JLOC has filled this maintenance manager role while working with the force headquarters to create a standard operating procedure for the SHERP vehicles and establish a reporting process that allows information gathering and analysis of the SHERP vehicle performance, maintenance trends, and cost.

U.N. Experience

Service as a U.N. peacekeeper and U.N. logistics staff officer has been a remarkably unique experience. Learning a new organizational structure and business practices is interesting and challenging. Still, the most incredible part of serving in a U.N. mission is the joint military and multicultural experience. For example, the JLOC comprises military officers from the United States, Canada, India, Kenya, and Bangladesh and civilian staff from the Philippines, Afghanistan, Ukraine, and South Sudan. The combined joint environment offers the opportunity to develop professionally in learning how other militaries conduct sustainment and in applying this experience to finding solutions to sustainment mission challenges.

There are military officers from countries with well-established relationships with the U.S. military, such as Australia, the United Kingdom, Canada, New Zealand, South Korea, and Norway, and there is also an incredible opportunity to interact and learn from other military officers from all over the world. Outside mission operations, the U.N. provides an excellent opportunity to experience various cultural events and holidays. From events like the Chinese Lunar New Year celebration to the Hindu Holi Festival of Color, from the Anzac Remembrance Day to Norwegian waffles (Hjertevafler) with brown cheese, all the cultural experiences are truly enriching. Participating in a U.N. mission presents an excellent way to broaden oneself professionally and personally; for most, it is a once-in-a-lifetime experience.

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Feature Photo
Left: U.N. convoy experiences difficulties while performing a ground resupply convoy in Bentiu, South Sudan, March 2023. (Photo by Maj. Joshua Lawrence)

Top Right: Bangladesh Force Marine Unit Light Patrol Craft perform force protection for the barge resupply convoy of Operation Lifeline along the White Nile River, Feb. 18. (U.N. Photo)

Bottom Right: Bangladesh Force Marine Unit welcomes a visitor on the Operation Lifeline Accommodation Barge, August 2019. (U.N. Photo)