

ECHELON OF AUTOMATION: The Future of Army Security Assistance

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“Each piece of the battle network is indispensable, but it is often the sharing of information that is most important, and most often overlooked. Things that sense and shoot are interesting. Things that share information are not. They are unsexy.”

Christian Brose, the Kill Chain

The U.S. military has an accountability problem. More specifically, the U.S. Army units tasked with executing over \$34 billion in materiel aid transfers to the Ukrainian Armed Forces have an accountability problem, at least according to a 2023 Department of Defense Office of the Inspector General (DoD OIG) report. While the DoD OIG serves a larger purpose for the Department, for the context of this article, the DoD OIG is the Department’s internal arm that audits Army operations to ensure the units executing those operations follow the necessary regulations to properly maintain accountability of personnel and equipment. The report successfully details problems those units face on the ground, but it misses the forest for the trees in addressing the true problem of large-scale materiel aid transfer and accountability.

This article addresses that forest by shedding light on an often-overlooked topic that will shape the future of Irregular Warfare in large-scale combat operations—that of the information systems that govern large-scale materiel aid transfers. The conflict in Ukraine is the most obvious contemporary example, but the future conduct of Irregular Warfare against near-peer adversaries will be largely constrained by the U.S. ability to transfer mass quantities of materiel aid into the hands of proxy forces on the front lines.





This article complements the 2023 Defense Industrial Strategy as a means to operationalize that strategy for the purposes of IW. This article will attempt to address the problems identified by the DoD OIG and offer a solution to transform this large-scale mission of emergency security assistance into an enduring capability for the conduct of Irregular Warfare in large-scale combat operations. The recommendations presented in this piece were developed over the author's experience supporting the Materiel Aid Coalition-Coordination Cell (MAC2C) mission responsible for delivering over \$34 billion in domestic and international materiel aid transfers over a period of nine months.

The MAC2C served various roles, but primarily, it served as the primary tracking authority and transfer agent at the final Department of Defense (DoD) logistics node conducting the handoff to the Ukrainian Armed Forces. Concisely, the DoD OIG report found that the MAC2C team "swiftly and effectively received, inspected, staged, and transferred defense items often within hours of receipt." However, the team did not consistently complete the documentation or record item quantities before transfer to the Ukrainian Armed Forces, mostly because it "could not confirm the quantities of defense items received against the quantity of items shipped for three of five shipments we observed, as the [Defense Transportation Regulation] DTR requires."

The DoD OIG concluded that the two primary reasons for the inconsistent accountability were the following:

- **The military services and defense agencies did not provide required information on shipping manifests or coordinate shipments with the U.S. Transportation Command.**
- **Standard operating procedures in Jasionka did not specify Defense Transportation Regulation-required accountability procedures and DoD personnel did not receive training or guidance on DoD policy requirements.**

The DoD OIG findings struck at the heart of the matter, but their recommendations were as limited as the scope of the investigation. The Army can absolutely solve this problem as it does so many others—with more personnel white-knuckling the issue in Excel to create more paperwork. The Army could also choose a better solution. It can address the root cause of the accountability issue and, in the process, solve several tangential problems at various echelons while laying a foundation for rapid innovation for the future IW support.

The true culprit behind the multibillion-dollar accountability disarray is the Army's many disparate Enterprise Resource Planning (ERP) systems. An ERP system is a software system common to manufacturing and logistics industries that serves as an organization's single source of truth for the enterprise regarding its supply chain, operations, and finance. Not surprisingly, the U.S. Army has over 20 legacy sources of truth that may be unable to communicate, are often redundant, and frequently yield different results.

In a 2018 Army Sustainment article, Lt. Col. Jeffrey Lucowitz identified three separate systems just for ammunition at the theater level. Only one of the systems was even accessible below the brigade combat team, and not one of the systems accounted for coalition, interagency or host-nation forces. That lack of security partner integration is a significant oversight in sustaining large-scale combat operations—these systems are critical due to the staggering breadth of logistics necessary to fight a near-peer adversary. Without even considering other international support, U.S. donations to Ukraine alone include 24 different types of ground systems and 18 unique types of fires systems and projectiles. This is further compounded by system variants, associated basic issue items, variant-specific accessories, and maintenance and replacement parts. The complexity of this issue cannot be overstated. And the Army is not blind to that reality.

In an effort to address the accountability challenge, the U.S. Army has explored a number of initiatives, including the creation of a Contested Logistics Cross-Functional Team and conducting multinational exercises such as TALISMAN SABRE 2023, which had a decidedly complex logistics focus. The Army is also targeting connectivity and redundancy issues with the introduction of the Enterprise Business Systems-Convergence (EBS-C), which aims to effectively integrate all 24 major ERP systems by 2032.

Fortunately, the Army need not choose between status quo and a distant solution. Instead, it should seize the opportunity to rapidly develop, test, and deploy a software solution at the speed of operational relevance that will have lasting effects for the future Army. To accomplish this, the Army should direct the Artificial Intelligence Integration Center under Army Futures Command to develop a system capable of executing materiel aid tracking from point of origination to point of delivery at the company level of execution. Such a solution would solve multiple immediate problems for the Army while laying the foundation for innovation on medium- and long-term objectives.

This notional system—for purposes of this article labeled as the Materiel Aid Transfer Tracking Tactical (MTAC)—should be structured in the exact opposite manner of EBS-C, a system with the explicit goal of combining all Army ERP systems from the top-down over the course of a decade. Conversely, the new MTAC system should be limited in scope, beginning as a minimum viable



German Army Soldiers conduct tactical combat casualty care during the Joint Pacific Multinational Readiness Center (JPMRC) rotation at Townsville Field Training Area (TFTA), Townsville, Australia, July 23, 2023. Talisman Sabre is the largest bilateral military exercise between Australia and the United States advancing a free and open Indo-Pacific by strengthening relationships and interoperability among key Allies and enhancing our collective capabilities to respond to a wide array of potential security concerns. (U.S. Army photos by Spc. Mariah Aguilar)

product (MVP) aimed at tackling problems from the bottom-up. As this new system grows and incorporates more and more ERP systems, it will be easier to seamlessly connect with the EBS-C when it reaches full operational capability.

Redundancy and connectivity challenges are not limited to automation and will not be entirely solved by programs like MTAC or EBS-C. Just as there are countless ERP systems, the DOD agency responsible for leading and managing security force assistance—the Defense Security Cooperation Agency—lists innumerable methods and authorizations for executing security assistance programs. The Army should pick one assistance program and one category of materiel when developing the MTAC MVP. In terms of the immediate Ukraine situation, the Army should choose the Presidential Drawdown Authority (PDA) as the program to supply all Class V—ammunition of all types, bombs, explosives, missiles, and rockets.

Beginning with the PDA makes sense. Over 50 percent of U.S. equipment provided to Ukraine was accomplished through this funding source, and it is also the funding source facing the greatest difficulties across the Army. Established under the Foreign Assistance Act of 1961, the President is authorized to drawdown from the inventory and resources of any agency of the U.S. government in response to unforeseen military emergencies or other legislatively authorized purposes. Until recent years, the PDA saw only limited usage as a funding source outside of the Ukrainian assistance; its use was limited to such emergencies as Moldova in 2016 and Lebanon in 2021. As a result, the relevant tracking and accountability processes never evolved to account for the massive amounts of aid witnessed with Ukraine.

Additionally, as the DoD moves to rebuild its critical munitions manufacturing capacity and shore up reserve stockpiles through multi-year munitions procurement contracts under the FY23 National Defense Authorization Act, the PDA funding method provides a uniquely convenient way to leverage those contracts. As the PDA pulls from existing stocks, the DoD can indirectly utilize those continually replenished stocks to respond to overseas contingencies and emergencies through PDA-funded materiel transfers. Beyond that, the PDA will likely continue to be a preferred funding source for security assistance because 1) the annual cap

before requiring Congressional approval was raised from \$100 million to \$14.5 billion per fiscal year, 2) the emergency provision of the PDA makes it incredibly adaptable, and 3) the recent announcement of \$1.1 billion in aid to Taiwan and the emergency Israeli aid package using the PDA illustrates its speed and flexibility to support varied security partners—particularly when compared to the lengthy bureaucratic processes of other security cooperation funding measures. The PDA is the logical funding source to limit the scope of MTAC for MVP.

This approach has its limitations. Class V items, for example, may still be too broad in the early stages, since ammunition and projectiles can be pulled from any theater. By limiting the MVP to strictly covering the Class V munitions shipments conducted from the Army's ammunition depots managed by Army Materiel Command or an Army component under a single theater, the system could tackle enough complexity to prove its usefulness while minimizing bureaucratic friction during development. For example, the Army Materiel Command and its Army's Organic Industrial Base of government-owned, government-operated depots and manufacturing arsenals provide a wide array of munitions, including over 60 different conventional ammunition products ranging from 40 to 175 millimeters. Such arrangements would allow MTAC MVP oversight from the manufacturing assembly line to the point of impact. The advantages commander and their skilled logisticians are evident.

By limiting the scope of the MTAC MVP to the PDA funding source—and even further limiting the materiel tracked to Class V munitions falling under Army Materiel Command—the new system may begin to solve the most immediate problems of accountability and tracking across multiple commands while allowing for rapid iteration and the creation of interdepartmental relationships essential for a burgeoning software capability. However, the most crucial component for the success of this new system is generating buy-in with the Soldiers and staff tasked with using it, which is why the system should be built from the bottom-up.

Current Army ERP systems exist at the level of the brigade combat team and above, and those responsible for tracking and reporting deliveries function below that level. Any large-scale

materiel shipment to any nation will ultimately be packaged and delivered at the company level or below by junior Soldiers and officers. Unless this new system reaches down to that level, such a capability will only provide a partial solution. This was evidenced by the massive workflow difficulties at the MAC2C and subsequent higher staff units. Lack of access to those ERP systems mandates that the lower levels conduct their work under atrocious workflows with challenging spreadsheets and hand-typed reports compounding errors at every level.

The burden of bad tactical-level workflows ultimately falls on the strategic-level headquarters staff tasked with weaving together a common operating picture. Much like a tactical unit conducts an echelon of fires to attack a target, the strategic staff is the target that is bombarded with bad workflows and arcane reporting processes. However, if the MTAC MVP is built from the bottom up, beginning with the oft-disregarded workflows of the junior Soldiers and officers executing these shipments, the Army can tackle this problem with an echelon of automation. By solving the workflow problems of the lowest units and integrating the tactical, operational, and strategic units within a central data architecture, the Army can automate tasks at every level with increasing gains in efficiency that result in an information advantage for the commander.

As the MTAC capability grows and matures, the Army can continue to solve those immediate problems, but the Army can also move to generate valuable capabilities in the medium and long term. For one, the MTAC system could expand to encompass additional funding sources and classes of supply, eventually running the gamut of the security assistance authorities and becoming the single source of truth for DoD security assistance. Such a source of truth would provide greater value for the security force assistance funds by reducing logistical and legal burdens and eliminating redundancy and connectivity issues. The streamlined efforts under this single source would free the Army's units primarily charged with executing security force assistance—Special Forces, Psychological Operations, Civil Affairs, and security force assistance brigades—from the complex administrative and logistical burden of assistance, allowing freedom to maneuver and adjust policy on the ground as they continuously shape the battlefield.

Looking ahead, once the base MTAC achieves maturity and proves itself on the battlefield in Ukraine, the U.S. Army can begin to envision further potential use cases with the Army of 2040 and the Joint All-Domain Command and Control ecosystem. Army data scientists and operations research analysts can learn from cleaned and aggregated logistical data, perhaps even associating specific shipment groups or materiel with battlefield effects. From that, operations analysts could tie security assistance tracked by MTAC to the frontlines of the battlefield and generate multimodal machine learning models for what amount and type of security assistance is needed to create certain desired effects. Such insight might be capable of providing uniquely detailed planning assistance, for example, to the defense of Taiwan and help those planners in translating lessons learned from the MAC2C and Ukraine. Following the logistics path, one can also easily envision a capability that allows the U.S. Army to follow a given munition from the assembly line as it traverses the intermediate nodes on its way to the battlefield. Staffs of each node could query the central data architecture with detailed insight into the specific throughput

constraints of their node. Then, commanders of each unit could analyze a given product's path to identify and proactively alleviate chokepoints.

Accurately tracking munitions from the industrial base to the battlefield can further inform future contested logistics development efforts and industrial base policy. A detailed understanding of the challenges inherent with sustaining large-scale combat with accurate and useful datasets can greatly inform future efforts in maximizing the sustainability of the future battlefield. Combined with the latest industrial policy of the United States regarding reshoring manufacturing capabilities of various industries, MTAC could provide datasets with time-to-battlefield tables and associated battlefield effects. This information could provide the DoD with the clarity required to create novel contracting solutions for the capacity of the defense industrial base and cost-savings in surge capacity.

Building on the medium-term potential to reach for the long-term capability and the information advantage associated with AI, an MTAC-AI capability can also be envisioned for the Army of 2040 under the Joint All-Domain Command and Control ecosystem. It is possible to foresee how a 2040 theater commander watching the threat of large-scale regional combat between two actors and might look to MTAC to validate or abandon courses of action. The staff could compare the analyses for battlefield effects of similar actors supported by U.S. materiel aid in the past, generate detailed reports on potential time-to-battlefield responses for various types of materiel, use the Army's primary security force assistance units to begin shaping the battlefield immediately with automated legal compliance under the various authorizations allowed, coordinate with the integrated logistics counterparts of allies, and use this information to inform the Joint Chiefs to prepare the flexible surge capacity contracts necessary to sustain a protracted battle—all in less than a week.

Perhaps the United States and its allies have created such an impressive display of integrated deterrence that this battle never happens. If it does—given the pace of innovation of the past decades—the fusion of MTAC and replicator drones might immediately generate replacement manufacturing orders to the nearest contested logistics node at the very moment those drones are eliminated, thereby generating an even greater decision-making space for commanders and policymakers. With nearly 20 years of lead time, these capabilities are realistic if the U.S. Army acts now and lays the foundation to improve the information systems that govern materiel aid transfer. In developing a bottom-up system for materiel transfer tracking, the Army can achieve short, medium, and long-term information advantage objectives while simultaneously enhancing its transparency and accountability to taxpayers for billions of dollars of materiel aid provided to our security partners.

Note: 1st Lt. Jonathan Roberts is an infantry officer and recently selected Artificial Intelligence Scholar in the U.S. Army currently serving at the Army's Artificial Intelligence Integration Center. He was a small contributor to the larger Materiel Aid Coalition-Coordination Cell (MAC2C) mission responsible for delivering \$40-plus billion in domestic and international materiel aid transfers over nine months. He holds a master's in economics and international diplomacy from Georgetown University, as well as degrees in mechanical engineering and political science from Louisiana Tech University. He is also a former research intern at the Center for Strategic and International Studies under the Defense Industrial Initiatives Group, where he contributed to research on defense contracting and acquisition.