ARMY SUSTAINMENT ENTERPRISE'S
DELAYED APPROACH TO DATA MODERNIZATION

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Artificial intelligence (AI) is coming, but not for the tactical Army sustainment enterprise. At least, not until the Army sustainment enterprise formulates a clear and actionable data strategy. In this article we address challenges facing the implementation of AI for predictive logistics and explore opportunities to bridge the gap through internal innovation and partnership with industry. We outline five areas the Army sustainment enterprise must address to fully employ predictive logistics for effect. These are data collection, data storage, data transfer, data analysis, and data visualization.

Data Collection

The Army sustainment enterprise has data in troves — it is just not collected in a standardized or useful manner. The best example of this is Global Combat Support System-Army, where maintenance and supply data is collected in a uniformed manner down to the individual part and vehicle platform. This data is consistent across the Army, which allows for the application of analytical tools for forecasting. Units have demonstrated the value of this data in predicting future equipment readiness, which is a precursor for predictive logistics.

However, the Army does not collect data for other commodities with the same diligence. Fuel, water, and ammunition all lack central databases with standardized data entry across different units and echelons. How the 2nd Stryker Brigade Combat Team, 4th Infantry Division, collects fuel and water data differs from how the 2nd Infantry Brigade Combat Team, 82nd Airborne Division, collects fuel and water data. To enable predictive logistics, the Army must establish data standardization for the collection of critical commodities down to the tactical unit level.

The sooner we standardize data collection in a training environment, the sooner we can implement predictive models. More than 15 combat training center rotations are conducted every year, and commodity consumption data is collected for each unit. Yet, each incoming unit starts from scratch for consumption projections. We are missing the opportunity to leverage predictive modeling at the unit level. Without collecting and sharing the data across the enterprise, we repeatedly solve the same problem set. By standardizing sustainment data collection across the Army, models can be trained to predict future states. Further, data standardization enables the Army to operationalize data.

If the Army focuses its modernization efforts on data storage, there is an opportunity to overcome the requirement of standardized data collection through the data pipeline. An extract-transform-load process can be added to transform the data that is collected in different structures to the same usable format. While this overcomes the potential headache of developing and implementing Army-wide data collection formats, there is still the requirement of units to collect data. Data cannot be leveraged if it is not collected and stored.

Data Storage

The Army must store collected data in a manner that enables units at echelon to access it and to apply analytical tools to it for staff analysis. Commercial industries have transitioned to cloud-based data storage and have maximized the capacity and usefulness of their previous data storage systems. Cloud-based storage enables secure, decentralized collaboration and allows users to access the data needed to improve analysis. The Army is also moving in this direction, publishing *The U.S. Army Cloud Plan* in 2022, which directs the Army to "adapt its processes to be more agile, its network to be more resilient, its hybrid public and private cloud environments to be more elastic, IT software design and fielding approaches to be more cloud native, and organization structures and training to be more effective at information warfare." The establishment of cARMY, a general-purpose cloud environment, is a great place for the Army sustainment enterprise to store all logistics data in a standardized format. This enables units at echelon to access troves of data for analysis; it even provides the opportunity to apply AI and machine learning (ML) tools through cARMY's instance of the Jupyter Notebook.

Data Transfer

Data transfer is critical for enabling analysis at echelon of ground reporting to allow the rapid and precise application of resources. For Army sustainment and predictive logistics, this means collecting data into a cloud with multiple transport methods. In garrison, this is easy because our cloud instances are stable, and data collection is not in competition with securing a position or maneuvering. It becomes more complicated in combat where a near-peer adversary can employ cyber capabilities to target or intercept data transmissions.

Ideally, tactical units report standardized data formats for maintenance, supply, ammunition,

fuel, and water where it is collected at the brigade level into a cloud database. This database is accessible at echelon, which negates the current model of emailing logistics statuses to higher headquarters and operating from one- or two-day-old data. Once logistics data is input into the cloud, it is accessible at echelon for analysis. This method is similar to the method used by the oil industry. Data is uploaded into a secured cloud from offshore rigs where energy companies can access and use the data at onshore locations. With data standardization, a theater sustainment command can easily analyze the fuel consumption for all units operating in their theater and apply analytical tools and ML into a predictive model that learns as more data is transported into the model.

Data Analysis and Visualization

To employ predictive logistics, the Army sustainment enterprise needs to focus on data and speed. Without consistent and accessible data, we cannot predict a future state. Once the Army standardizes logistics data collection and storage, it needs to rapidly iterate experimentation of predictive models to advance capability toward employing predictive logistics.

Commercial industry relies on ML models and AI to conduct data analysis for decision making. While the Army understands the potential advantages of incorporating ML and AI into data analysis, it currently lacks the software, expertise, and accessible historical data necessary to integrate the models into daily problem sets. Efforts such as Enterprise Business Systems – Convergence (EBS-C) are attempting to merge and modernize current Army systems by combining them into a single platform at the enterprise level.

Data analysts, engineers, or coders do not currently exist below the division level in Army units. When attempting to conduct data analysis in the Army, units must rely on servicemembers in their formations that have knowledge on data analysis from their own personal interest through formal or informal education outside the Army. In addition to not having trained individuals when attempting to make progress in data integration, Army computers do not have the necessary software to conduct data analysis beyond standard spreadsheets. Interest in data analysis, along with ML and AI, is growing within Army formations, along with a desire to implement it into daily decision making, but a lack of resources to conduct data analysis is slowing or inhibiting progress.

Conclusion

In a perfect world, predictive logistics would enable a commander to have access to visualizations displaying current logistics capabilities of their subordinate units with forecasts for capabilities and commodity levels up to 96 hours in advance. This visualization would update as new data was input into the model, and the commander could then make rapid decisions about the precise application of resources. Unit logistics status and future status would be available to theater commands and to the industrial base to enable repositioning of national assets with greater efficacy. This perfect world is what predictive logistics could create with the employment of generative AI if we get our data processes correct. Initiatives such as EBS-C are developing a single platform for Army systems and are focused on implementation in 2032. This is where the commercial industry is now. Today, the Army sustainment enterprise remains in 2014. We are a decade behind the commercial industry. The journey to enter 2025 and to build the Army of 2040 enabled by predictive logistics begins with a data strategy and rapid experimentation. We cannot afford to fall further behind.

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Featured Photo
The Army Prepositioned Stock-5 M1224 MaxxPro mine-resistant ambush protected wheeled vehicles are prepared to be issued to the 44th Infantry Brigade Combat Team at Camp Arifjan, Kuwait, June 20, 2024. (Photo by Joseph Kumzak)