Revolutionizing Marine Corps Maintenance

Harnessing data as a strategic asset

by Mr. Christopher Hegland & Mr. Cliff Hanchett

Data is a strategic asset the Marine Corps must leverage to realize an immediate and lasting military advantage. The Marine Corps must maintain information superiority by providing the right information to the right hands at the speed of relevance. Dependence on multiple compartmentalized data sources subject to independent data manipulation and filtration can jeopardize information integrity and effective command and control. Proper data governance is essential for the Marine Corps' data-driven systems to ensure reliability, traceability, and modernized security standards for any data used by the Marine Corps' customer base in data-driven decision-making processes. The Marine Corps maintains a decisive advantage in the information domain by developing capabilities allowing Marines to focus on warfighting tasks rather than data entry and redundant administrative procedures.

Developing a Solution

The *38th Commandant's Planning Guidance* emphasized the need to close the gap in the Marine Corps' ability to collect, process, analyze, and leverage data to comprehensively man, train, and equip the force. To address these concerns, the Program Manager, Logistics Integrated Information Solutions Marine Corps (PM LIS2-MC) is delivering the logistics data services (LDS) capability to serve as the single source of truth to harness Marine Corps data and enhance decision making and accountability for the warfighter. The LDS platform is a centralized, non-transactional data repository to enable

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Effective maintenance management requires complete information based on reliable data.
(Photo by Cpl Nathaniel Cray.)

enterprise-wide data-driven decisions for Marines and Marine Corps customers, facilitating more timely and actionable logistical predictions, increased intelligence, and effective decision making based upon and informed by accurate data.

LDS is aligned with the DOD's Software Modernization Strategy to enable resilient software capabilities rapidly and securely. PM LI2S-MC leverages the Scaled Agile Framework methodology for planning and delivery, allowing customer-focused

solution development, collaboration, and iterative development. The LDS capability provides transparency and data standardization to improve the workforce and warfighter's ability to address technical data needs through more efficient information flows to the tactical edge.

The LDS Capability

The LDS team is at the forefront of organizational change management by breaking down legacy cultural barriers and data-sharing norms to maximize informed decision-making potential at all operational levels. LDS will provide the data hub that will facilitate Marine Corps logistics data governance to support data quality, exploratory data analysis, and visualization. LDS is a web-accessible application hosted in Marine Corps Business Optimization Support Services, a Federal Risk and Authorization Management Program Accredited Level 4, Amazon Web Services DOD GovCloud environment. LDS enables tools to allow users to exploit their data for informed decision making, creating an operational advantage for the warfighter. These tools include the implementation of Amazon QuickSight, an easy-to-use, cloud-scale business intelligence service that allows users to combine data from different sources into a single data dashboard. It also enables decision makers to explore and interpret information in an interactive visual environment. The LDS effort includes the delivery of a family of services created using Scaled Agile Framework-based processes, industry-standard data management practices, and controlled using data governance.

Data Governance

Data governance is a principled approach to managing data during its life cycle, from acquisition to disposal, and ensuring data is secure, private, accurate, available, and usable. It includes the actions people must take, the processes they must follow, and the required supporting technology throughout the data life cycle. Data governance aims to ensure that data is accurate, consistent, secure, and managed consistently with the organization's strategic objectives. LDS enables Data Governance through the following:

1. Defining data management standards and policies includes setting standards for data quality, security, and privacy and defining data management and use procedures.
2. Establishing data ownership: It governs data access permissions and what data is subject to governance. Data governance also involves complying with external standards set by industry associations, government agencies, and other stakeholders.

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3. Creating a data catalog: A data catalog is a central repository that documents the organization's data assets, including data definitions, data lineage, and data relationships. Procurement and supply-chain-management personnel need accurate data to keep inventories stocked and to minimize costs.
4. Enforcing data policies: This includes monitoring data usage and ensuring that data is used following established policies and procedures. Compliance personnel must prove that data is handled according to internal and external mandates.
5. Managing data quality involves implementing processes to ensure that data is accurate, complete, and consistent. Knowing that data has quickly become one of our most valuable assets. Senior managers need accurate and timely data to make strategic business decisions.
6. Ensuring data security: This includes implementing measures to protect data from unauthorized access, loss, or theft.

Operational Dashboards

The LDS team is operationalizing Marine Corps user data into a customer-centric dashboard to showcase information in a consumable format that will support actionable decision making across the Marine Corps Enterprise. These dashboards provide realtime insights into key metrics and trends, including advanced machine learning algorithms that automatically analyze data. These tools will improve controls, optimize resource management, give the Marine Corps a tactical advantage, and provide predictive insights to guide actionable decision making at all levels.

The initial LDS dashboards will support enterprise configuration management reporting and visibility of top-end items and sub-components, leveraging data from Total Force Structure Management System, Technical Data Management CATALYST, and Global Combat Support System-Marine Corps. This dashboard will allow users at all levels of command to see near realtime data from an organizational view to an equipment view, down to the serial number level, to identify configuration compatibility, readiness stats, service request order history, maintenance actions, and parts fulfillment lead-time from the source. LDS provides users with a robust dashboard and reporting capability to view and resolve identified gaps and shortcomings. The solution will support data governance as data owners can take action to resolve identified discrepancies to ensure information accuracy while enabling the total transparency of data across the Marine Corps Enterprise. These tools will empower our existing analytical community to leverage the advanced education investments of the Marine Corps. Additional reports in the pipeline are:

1. Marine Corps key suppliers: Leveraging sources from both internal and external to the Marine Corps to provide parts listings where the Marine Corps is a registered user within

the DOD catalog and their associated weapon systems to identify the location and onhand quantities.

2. Marine Corps key suppliers with service request order history: The report will be coupled with the Marine Corps key suppliers listing to identify Marine Corps high-use items with order fulfillment timelines with drill down to the ordering unit and weapon system association for trend analysis and forecasting.

3. Readiness reportable item comparison to Defense Logistics Agency (DLA) Weapons System Support Program: Provides a comparison between weapons systems identified within Total Force Structure Management System as readiness reportable with their identification in the DLA Weapons System Support Program and all individual National Stock Number parts, including criticality. The additional capacity will be analyzed for percent compatibility between weapon systems for proper placement and utilization of the Weapons System Support Program Group Designations.

4. Item Unique Identification: Leveraging Data from Global Combat Support System-Marine Corps, Technical Data Management-CATALYST, and Unique Item Identification System to provide a comprehensive evaluation by National Stock Number to onhand inventory locations of items that require Item Unique Identification registration within the Office of Secretary of Defense registry.

These reports are a snapshot of the initial dashboards planned as incremental releases. As additional interfaces are established with other internal and external data sources, LDS will inherit increasingly robust data sets to generate more comprehensive dashboards. Additionally, users across the enterprise are encouraged to propose the creation of additional dashboard views for review and approval by Marine Corps governance boards for potential inclusion into the LDS development backlog. Dashboard requests can be submitted within Technical Data Management Support at https://app.mcboss.usmc.mil/suite/sites/support/page/support-cases.

The future LDS platform will deliver enhanced analytical capabilities including AI and machine learning. (Photo by Cpl Anthony VanFredenberg.)

Analytics

The LDS platform will enable the future delivery of enhanced analytical modeling capabilities, such as artificial intelligence, machine learning, and deep-learning algorithms that will allow warfighters to forecast and generate insights that can be used to inform and, in relevant cases, automate decisions

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and actions. By understanding data and analytics as strategic assets supporting the Department of the Navy's Information Superiority Vision, LI2S-MC will provide a single interface for logistics data visibility and analytics through the LDS program. Additionally, LDS is aligned with the Department of the Navy's Jupiter and Advana, DOD's big data platform for advanced analytics, to collect and display critical insights from disparate data sources. Jupiter and Advana provide *analytics as a service*, presenting users with a simple, seamless experience from data discovery to insightful data visualizations.

Conclusion

By the conclusion of 2023, the Marine Corps will have created a cloud-based data hub of logistical data managed by a data governance board overseeing the defined business transformation and rules encompassing the data warehouse. PM LI2S-MC is meeting the mission to invest strategically in data science, machine learning, and artificial intelligence and leveraging existing data to collect, process, analyze, and disseminate information promptly and effectively. In concert with Marine Corps Systems Command, Program Executive Office for Manpower, Logistics and Business Solutions, Deputy Commandant, Combat Development and Integration, Deputy Commandant, Installation and Logistics, Deputy Commander for Information, and the operating forces, PM LI2S-MC remains integral to the plan to create and sustain a flexible, scalable, and portable IT environment that can provision and leverage data to make confident decisions for equipping the force to train for battle and win.

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