Technical Data Management

"One stop shop" for logistics product data
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Marine Corps logistics Technical Data Management (TDM) and Product Lifecycle Management have historically relied on obsolete, outdated, and disparate applications that resulted in data quality issues, process inefficiencies, high maintenance costs, and a lack of data integration of logistics management capabilities. This archaic approach leads to equipment supply and readiness issues throughout the Marine Corps and inhibits the ability to provide Logistics and Acquisition leaders with the quality information needed to make sound and timely investment, divestment, and product support decisions. To remedy these deficiencies, the DC I&L Logistics Information Technology Portfolio Management Strategy has defined requirements to inject modern technology and practices to improve logistics business processes and produce more structured and standardized data and information.

Developing a Solution

Timely and accurate information is imperative in making good decisions. Unfortunately, legacy logistics data, systems, applications, and business processes are often disjointed, relying on multiple command-line driven input on 1980s mainframe systems. Using legacy technology has made adaption nearly impossible, limiting the effectiveness and efficiency of logistic processes and the availability of quality data. The Department of the Navy Chief Information Officer also recognized this dilemma in other areas of the Naval

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Publications and Catalyst logos. (Logos provided by author.)

Services by publishing the Operation CATTLE DRIVE initiative to accelerate the modernization and transformation of our information technology (IT) capabilities by ensuring that decisions are made to sunset or rationalize unneeded, obsolete, unproductive, insecure, and un-auditable IT systems and applications.

To accomplish these objectives, DC I&L and the Program Manager, LI2S-MC needed to bring Marine Corps Logistics Product Data (LPD) into the 21st century with an intuitive application design that facilitates user interactions and provides both high-quality data and effective business process automation. The result is the TDM platform which provides the technical architecture for the rapid reengineering of logistic processes, using modern technology and systems design managed using an Agile software-development model, producing high-quality data through standardization while focusing on warfighter usability and information needs.

Modern Processes

The LI2S-MC mission is to transform and deliver state-of-the-art systems and services that enable the highest performance and readiness of Marine Corps logistics operations worldwide. The team needed to adopt an Agile

software development model to enable this. The Agile model is a transformative shift away from traditional "waterfall" models delivering incremental features that build toward a full capability. Instead, features are evaluated by the user base at the end of each iteration to ensure requirements are met and developed features are usable in day-to-day operations.

The Agile model provides flexibility and adaptability in program planning so that the team can shift focus to priority efforts as they appear and scale development efforts based on the volume of work required. Delivery to production is accomplished using a Continuous Delivery Pipeline process facilitated by an integrated Development-Security-Operations toolchain that ensures cybersecurity is baked in and bugs are limited in the released product. This iterative agile approach enables routine releases of software every two weeks and emergency releases in a matter of hours to days based on the level of effort involved.

Modern Technology

The TDM platform is a state-of-the-art logistics IT capability developed using a cloud-based low-code, rapid application software development platform supported by a scalable/flexible data platform. Using cloud services eliminates the need to purchase and maintain bare-metal computer equipment, reducing overhead costs and freeing the team to focus on process development and improvements.

Using low-code, Business Process Management software allows the TDM team to quickly produce applications and capabilities and adapt them to process changes rapidly. Using a nonrelational database, management shifts away from structured tables to ingest data in multiple forms from PDF, images, Extensible Markup Language documents, computer-aided design graphics, and much more.

Standardized Data

LI2S-MC built the TDM platform to facilitate the transformation of Marine Corps logistics data to the GEIA-STD-0007C industry standard. SAE GEIA-

STD-0007C defines logistics product data generated during the requirement definition and design of an industry or government system, end item, or product. It makes use of the Extensible Markup Language through the use of entities and attributes that comprise logistics product data and their definitions. The standard is designed to provide users with a uniform set of data tags for all or portions of logistics product data. It can be applied to any industry or government product, system or equipment acquisition program, major modification program, and applicable research and development projects. This standard is used by both industry and government activities.

Using the standard makes TDM data highly interoperable with both industry, other Marine Corps entities, other Armed Services, and DOD information systems such as the Federal Logistics Information System. Standardization of LPD also enables the workforce and warfighter to address technical data needs with more efficient process flows. The TDM platform is designed with built-in data validation tools, integrated reference material, and is developed with data quality safeguards to assist users in performing their tasks while improving data quality.

Focusing on the Warfighter

For information systems to be effective, they must focus on the needs and usability of the users. This is imperative for the TDM team: to build applications, capabilities, and services that will be used by the warfighter and provide value in their day-to-day operations. To enable this, the TDM team has built the platform and processes with unique abilities to assist the user to complete these tasks such as:

Training-as-a-Service

The release of TDM-CATALYST included the debut of the Training-as-a-Service construct. This innovative approach utilizes several built-in features in the application, including tooltips, data validations, reference material, training aids, knowledge-based articles, and videos for everyday tasks. The TDM platform provides multiple

avenues to training that mimic commercial application training. Within the application, users have access to a knowledge base that contains articles/videos on each aspect of TDM. Information links within the application provide users with access to source documentation to help them make informed decisions.

Along with in-system aids, a help desk/customer service center capability exists where users can submit a question from within the application. Before releasing an application or capability, a blog and webinar series provide future users with exposure to the new features. The webinars are available over Microsoft Teams and Adobe Connect (MarineNet), and each webinar is recorded and posted to MarineNet's Video Service. In addition, the TDM team developed a web-based training module and posted it to MarineNet Moodle for user training before application release. Understanding that significant changes require close management, the TDM product team did not discontinue all instructor-led training. The TDM team understands that users will accept a new system more readily if they feel familiar with it before its release.

Automation

In addition to a new way of approaching training, the TDM team also automated the System Authorization Access Request process. The TDM team designed and implemented a user self-registration feature that automates the authorization process, reducing the time required to access applications by 95 percent. This innovative construct enhances the user experience while generating better quality data.

Accomplishments

By embracing an Agile culture, employing modern technologies, standardizing Marine Corps Logistics Product Data, and focusing on Warfighter needs, the TDM team has been able to develop and deploy some truly transformative capabilities, significantly improving the efficiency of the workforce by eliminating swivel chair processes and impacting equipment and supply readiness at all levels. TDM-CATALYST, which focused on

modernizing catalog and provisioning functions, was deployed in March 2021, and TDM-Publications, which consolidates and manages all technical and non-technical publications, was released in September 2021.

TDM-CATALYST

The TDM-CATALYST application currently supports the cataloging and provisioning functions of LPD standards by providing automated workflows and data interfaces to support the acquisition, logistics, and product support community with streamlined product data management and delivery of current/accurate ground weapons systems and equipment information. Cataloging and provisioning are the first SAE-GEIA-STD-0007 standard functions incorporated in TDM-CATALYST, but the goal is that all aspects of the weapon systems Logistic Product Data will be developed.

The following are examples of the significant impacts made by TDM-CATALYST:

• Automatically identified and corrected over 367,000 data disparities related to the weapon system bill of materials and information sent to the Defense Logistics Agency (DLA) Weapon System Support Program. These automated actions aligned the information between the Marine Corps and DLA systems, aligning parts managed by DLA with their criticality to the weapon system to support urgencies in supply actions and fulfillment of dead lining or degrading parts. These efforts will increase weapon system readiness, especially for items determined to be mission-essential equipment to the Marine Corps mission.

• Provides a single source of truth for the 6,000 weapon systems and physical equipment configurations within the Marine Corps and transmit cataloging actions across the DoD to create and register LPD (e.g., National Stock Number or Part Number Price). TDM-CATALYST embraced the paradigm shift from performing cataloging transactions and implementing LPD to support life cycle analysis by implementing modern industry and DOD standard (SAE-GEIA-STD-0007) requirements.

TDM-CATALYST has modernized LPD into Total Life Cycle System Management through new system capabilities providing data validations, automated business processes, new interfaces and structures, and eliminating timely swivel chair processes. The direct interface through Federal Logistics Information Services Portfolio Data Warehouse enabled the updating and correcting of over 60,000 NSN prices within the Marine Corps GCSS-MC systems. The interface now provides real-time data that reflects the DOD Item Manager's established pricing. The correction of these prices also eliminates the supply department's need to balance and update requisition pricing.

TDM-Publications

Following the successful release of TDM-CATALYST, LI2S-MC deployed TDM-Publications, an application that provides users access to all technical and non-technical publications and business/management processes for all publications in the Marine Corps into a single location. TDM-Publications users can create and share custom-built libraries, receive critical update notifications in real-time, and request and track submitted Publication Change Requests, all from within the application. The deployment enabled the retirement of five separate legacy applications and multiple SharePoint repositories.

The following are examples of the significant impacts made by TDM-Publications:

• Transforming from paper to digital publications supported the elimination of warehousing requirements, which totaled over 100,000 publications valued at $970,000 and enabled Marine Force Storage Command to repurpose climate-controlled warehouse space to long-term storage of critical warfighting equipment.

• Eliminating paper libraries decreases a unit's deployment footprint, increasing mobility and reducing transportation requirements. TDM-Publications also provides for the rapid dissemination of publication changes. For example, a technical manual can be updated with critical safety information, and the warfighter is informed as soon as it is published. This rapid capability eliminates the need for corrections and automates some Field Supply & Maintenance Analysis Office inspection requirements.

• Providing the user with a single location for all technical and non-technical publications with an automated notification process for updated publications and the capability to automatically update the user publication library. TDM-Publications consist of 11,000 traditional publications and critical information for approximately 6,000 weapon systems and equipment items that comprise over 1 million parts. TDM-Publications are designed for the next-generation database that provides the user with a simple interface and the ability to store traditional publication formats and the next generation of Interactive Electronic Technical Manuals.

The legacy NAVMC 10772 process was replaced with the TDM-Publications Change Request (CR) capability. The CR capability creates an interactive feedback loop between the submitter and the Program Management Office for any LPD or Publication changes. In addition, the CR feature allows the user to screen change requests submitted by other users against the same document and provides the user a realtime status of the change request submitted.

Conclusion

The TDM platform continues to revolutionize how the Marine Corps approaches Enterprise Logistic Product Data and Publication Management and Training utilizing the Agile methodology. TDM-CATALYST and TDM-Publications applications have vastly improved Marine Corps logistics capability and awareness and set a precedent for other armed Services to follow. The TDM platform will continue to grow, automate, and improve. It is all about the data!