The DMLSS Program Brings Electronic Commerce to the Military Medical Treatment Facilities

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CROSSTALK

The Defense Medical Logistics Standard Support product suite establishes an electronic commerce solution that has transformed the acquisition and distribution of medical supplies to both peacetime hospitals and deploying forces. A just-in-time inventory system provides medical supplies within hours, and lower priced regional contracts with dedicated vendors have reduced costs.

The Defense Medical Logistics Standard Support (DMLSS) product suite has given a whole new meaning to the term *modern medicine*, or more specifically to the *delivery* of modern medicine. DMLSS establishes an electronic commerce solution that has radically transformed the acquisition and distribution of medical supplies to both peacetime hospitals and deploying forces. Gone are the massive amounts of medical inventory in depots and retail activities. Instead, a modern just-in-time inventory system provides medical supply support with response times measured in hours, not days or weeks.

"To support the hospitals in the 1990s, medical logisticians in all three services used manual processes to take requirements, including filling out paper requisitions to give to the depot [warehouse distribution center]," said Col. Cathy Erickson, the DMLSS program manager, Joint Medical Information Systems Office, TRICARE Management Activity, Falls Church, Va. "Stored at the depots were six to 12 months of medical supplies. Turnaround time was 30 to 45 days. Every receiving document was done manually, including processing through the financial system. Payment to commercial vendors could take six months. Manual methods were also used for inventory and equipment records."

With DMLSS, medical supplies are not only delivered faster and more reliably, they are also substantially less expensive. High-priced local contracts between medical treatment facilities and local pharmaceutical companies have been replaced by high-volume, lower priced regional contracts with dedicated vendors through the Prime Vendor program, Erickson explained. These savings will only increase annually due to automated tools and a comprehensive database integrated with commercial purchasing and electronic commerce practices. "This change in the acquisition process has been pivotal to transforming the military medical logistics supply chain into an industry model."

Using Department of Defense (DoD) communications capabilities, forward medical units are now able to order materiel directly from commercial distributors using standard electronic commerce transactions in a fraction of the time, at a fraction of the cost. The DMLSS' Web-based ordering initiative allows customers to electronically browse, compare, select, and order non-prime vendor items via the Internet, while retaining the ability to electronically interface with existing medical and financial systems.

"A drug is ordered electronically. The order is transmitted electronically to the Prime Vendor who fills the order the next day. Payment is done electronically and received within 30 days," said Erickson. "This reduced facility stock has allowed us to reduce depot supply to military unique items."

The full range of the DMLSS product suite also provides capability for inventory management, facility management, equipment and technology management, Web-based customer support, business intelligence, customer area inventory management, and assemblage management. The Prime Vendor program provides access to more than 1 million medical materiel items.

"We now have electronic cataloguing, electronic money management, and quality assurance checking embedded for Federal Drug Administration recall information on drugs or equipment," said Erickson. "We also receive pricing updates as recent as 30 days from negotiation versus six months, reducing risk of hospitals' ordering at a wrong price. In all, for every $1 spent on the DMLSS, $6.40 is returned to facilities to deliver healthcare. And we're not done yet."

Years in the Making

The DMLSS automated information system was developed in three releases. Release 1, deployed in the 1996-1997 calendar years, included a facility management and product and price comparison capability. Release 2, deployed in the 2000-2001 calendar years, added customer area inventory management capability that included hand-held terminal technology. Release 2 also included a Web-based customer support module and an improved Prime Vendor interface.

Release 3, currently being deployed worldwide to 110 medical treatment facilities and to 86 very small sites, adds equipment management and maintenance, higher level inventory management, and readiness assembly management capabilities. Release 3 replaces service legacy systems in DoD medical treatment facilities. It also provides a comprehensive readiness management program allowing a seamless, automated, and efficient transition from peace to contingency/war. It operates on varied platforms in support of deployed operations and has the flexibility required to meet military service requirements.

The DMLSS system is a complex, client-server system containing approximately 3.5 million lines of software code. This code includes customized medical logistics functionality developed at the program's development facility, as well as five client-side and 17 server-side commercial off-the-shelf products that have been fully integrated into the system design, explained Debbie Bonner, Director of Operations at the DMLSS Program Office. "All military groups met in a joint development group to turn in specific requirements. A configuration control board put the requirements together and sent them to the services medical logistics chiefs for approval. Those requirements were then put into

very specific SHALL statements."

Three types of inputs were used to develop requirements, said Lt. Col. Ken Darling, Director of DMLSS Business Process Reengineering. "The user provided direct input in changes to the system. The medical logistics chiefs each provided direct input needs independent of enterprise needs. Third was to consider what is available in the industry today." This last consideration was made to build language code into the system to support technology that is years away in development such as embedded tags on pallets that can be machine read.

To make requirements changes requires a meeting with users from all three services, explained Bonner. "Requirements are defined using standard terminology that is built into our system. Users meet to hash out new requirements and develop concurrent terminology that becomes part of that standard language. They can use the system differently, but we maintain standard terminology." The DMLSS development team remains very close to its users. A representative from each service sits in the program office, two representatives are in the development center, and a third splits his time between Washington, D.C. and the development center. "Lots of communication is a big part of our process," said Bonner.
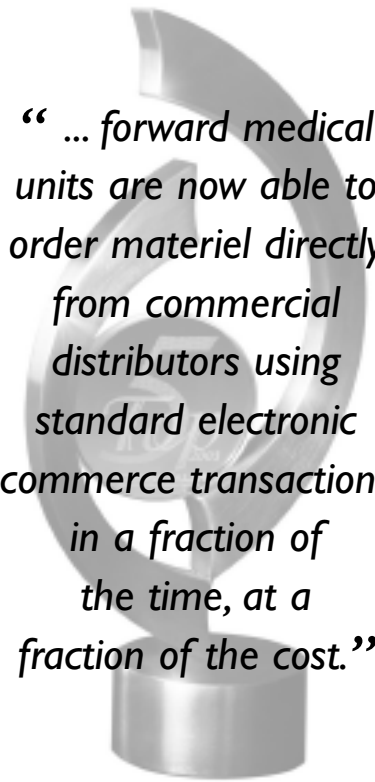
More than 200 development workstations of up-to-date configurations, with several operating systems simulate the various field environments. The database engine is currently Informix, however, a new effort is underway to convert to an Oracle database engine. "The conversion is necessary because the depots support the battlefield theatre, and they are ahead of us using Oracle. This will put us on one platform in peacetime and wartime."

"Another advantage is cost savings," said Darling. "Our current platform costs about $25,000 to $30,000. We think the Oracle platform will cost less than $5,000. There will also be cost advantages in maintenance and overhead."

The DMLSS team uses a Rapid Application Development approach to software development and sustainment, and has refined the configuration management and functional testing process to the extent that it can support rapid evolution and quality assurance goals, as well as rapid deployment to the field for all software upgrades and corrective actions. Functional and technical experts test each release of the system at the development center. Defects are corrected through quality assurance steps in the process. Each development contractor is required

to provide CMM Level 3-like processes.

Peer reviews and code walkthroughs are used for early problem identification. Developers conduct unit testing as a part of each software build. Integration testing is a regular process in the effort to produce a DMLSS release. Special testing plans are put in place for designated system-wide business processes. Periodically data anomalies and user-driven problems occur in fielded systems. The DMLSS development center addresses these anomalies through a modification of the data conversion process. The configuration management organization is able to

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rapidly patch data through a defined and repeatable process and keep sites running with uninterrupted operations.

Each development contractor is required to report financial and schedule performance according to an earned value methodology. As such, cost performance and schedule performance curves are calculated and delivered as a part of a contractually required monthly progress report. These reports are reviewed with DMLSS program and development center leadership on a monthly basis during contractor financial reviews. The latest cumulative indices show a cost performance index of 1.06 and a schedule performance index of 0.98.

Lessons Learned

In looking back Bonner said, "Nothing succeeds like success. Each time we put

out a release, we learned from our mistakes." There was a lot of learning with software and hardware deployment. Bonner said she realized how important it was to have weekly meetings within the services to determine when they were coming for installation and the amount of training room space needed. "The first release was Russian roulette to deploy, but much more communication with later releases made it a smooth delivery. We learned it was very important that every entity on the deployment team needed to be on the same page through weekly conference calls."

Erickson agreed, adding, "We would show up and the chief information officer would say that he didn't know we were coming, so we couldn't tap into their network." Erickson said they learned it was important to know the hospital needs ahead of time and have the users develop the deployment schedule. "Then we held them on task to stay on schedule, replacing deployment facilities if one backed out."

The DoD medical user community has embraced DMLSS' changes in acquisition strategy and its pioneering electronic commerce efforts. The Prime Vendor initiative capitalizes on the efficiencies of commercial distribution channels, reduces procurement times from up to 45 days to two days or less, reduces inventory by up to 85 percent, and has a 95 percent fill rate in less than 24 hours. Web-based ordering provides customers a wide variety of commercial items at negotiated and very competitive prices and expedites payment through the acceptance of standard military electronic transactions and government-issued credit cards.

The new DMLSS emphasis is on smarter, more cost-effective acquisition through electronic commerce, committed volume purchasing, and long-term partnership with suppliers. The DoD medical user community now has at their fingertips a fully automated and integrated inventory and information management system coupled with the best acquisition business practices in place enabling them to meet the medical logistics needs of the military services in the 21st century.◆

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