Lockheed Martin's I-GUIDES™: Providing a Common Solution to IUID

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~Richard Erickson, Program Manager, Lockheed Martin Emergent Technologies

In August 2004, Lockheed Martin delivered the first Department of Defense (DoD) Item Unique Identification (IUID) compliant shipment in Akron, OH. To the casual observer, the small 2D Data Matrix applied to each item may have seemed like a superficial modification, but for Lockheed Martin, it marked a major milestone in the company. Just 5 months after formally beginning their IUID compliance and optimization efforts, Lockheed Martin had initiated a successful implementation plan and delivered the first compliant shipments with remarkable speed.

Recognizing Opportunity

The company's quick turnaround was due in part to their early recognition of IUID's sweeping potential. Lockheed Martin had begun looking at the technology several years earlier as an enabler to a paperless factory and began to design their I-GUIDES™ software application with this end in mind. Despite their foresight, however, Lockheed Martin was still far from implementing the technology throughout their own business units when the DoD mandate was released. They formally began their joint IUID and Radio Frequency Identification (RFID) compliance efforts on March 30, 2004 with the formation of an Integrated Product Team (IPT). Richard Erickson, program manager for emergent technologies, credits Lockheed Martin's success to the company's early understanding of the scope of implementation. "We saw the mandate as a corporate-wide requirement and created the IUID/RFID IPT at the corporate level to address how Lockheed Martin would become compliant. It was formed to coordinate the development, integration and deployment of the new technology for the fluid DoD IUID and RFID requirements. Our success is a direct result of the vision and structure established up front by the corporation." The company gathered a diverse group of commercial and government experts to sit on the self-directed IPT, including a variety of Lockheed Martin's own subject matter experts and change agent experts, as well as DoD customers, supplier representatives, and participants from OSD and DCMA.

Once an item is received, it is scanned by a reader and the data is electronically recorded.

At its inception, the IUID/RFID IPT was given the considerable task of assisting Lockheed Martin business units, DoD government programs and corporate suppliers with their IUID, RFID and Wide Area Work Flow (WAWF) preparation, implementation, integration, and optimization activities. In order to accomplish an undertaking of this magnitude, the team had to overcome at least two major challenges. The first, according to Erickson, was the ability to import legacy database information and communicate it to production, shipping, and contracting systems. This proved a challenge because "current state" infrastructure, processes, and business activities varied by business unit and program. The second was ensuring identifier uniqueness across an enterprise with multiple EIDs and locations. As Erickson notes, "The technical objective was to significantly reduce preparation, implementation, integration, and operation activities at all Lockheed Martin business units. The company itself is a collection of 70 or more separate businesses. They are independent companies brought together under one name, but they're all still using their previous architecture and legacy systems. If each company had to be uniquely compliant to the mandate, it would've been extremely expensive and time consuming."

Developing an Approach

In order to address these challenges, the IPT provided a one-company concept resulting in a single compliant solution. By developing and leveraging common and adaptable toolsets, the team hoped to streamline implementation across the varied divisions of the company. As Erickson explains, "Our goal from the beginning was to focus on commonalities and eliminate duplicate efforts. We concentrated on finding a common response to reduce the cost impacts of redundant activities throughout the corporation to its customers and suppliers. Because of this, we wanted toolsets that could be used across the corporation both to avoid duplication and to allow disparate branches access to shared templates and information. For example, functional toolsets streamline Contracts, Engineering, Estimating, Program Management, and Supply Chain into the same processes and templates. Having a common approach like this provided reductions in cost and gains in efficiency."

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A 2-dimensional data matrix is encoded with the data elements necessary to construct a Unique Item Identifier (UII) which is globally unique and unambiguous.

Finding a Common Solution

Lockheed Martin found the integrated solution they were looking for in their own I-GUIDES™ software. "We began working with the IUID concept before the mandate, then tailored the IUID syntax to be compliant to the mandate. What we came up with is an application that is responsive to the mandate but is driven by internal processes like data processing, flow, utilization, and management," says Erickson. Industry masters had projected a timeframe of 3-5 years to transform and optimize IUID and RFID technologies across the company's business units, but by providing a common interface for all legacy systems, Lockheed Martin was able to overcome several major obstacles with a single application. "Lockheed Martin saved millions of dollars with a common web-based tool approach. Because I-GUIDES™ provided the ability to use the organization's existing database information, Lockheed Martin could deploy and become IUID compliant quickly," Erickson notes. In addition, having a single application has also reduced the effort needed to set up the system at a given business unit: "The time needed for a remote organization to become operational and trained in the use of the application is less than 2 days, and all of the training materials are online and interactive. This allows the contracts needing IUID capabilities to respond quickly." Lastly, the integrated approach allows WAWF to interface with the data management tool for all organizations.

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Mitigating Challenges

I-GUIDES™ resolved many of the internal business process challenges involved with IUID/RFID implementation, but Lockheed Martin was also confronted with the difficulty of managing supplier flow-down costs. Because a high percentage of IUID items were likely to be provided by the supplier base, the company had to find a way to mitigate expenses as efficiently as possible. According to Erickson, Lockheed Martin started with communication: "We notified or surveyed over 1,500 of our suppliers about the IUID requirements. Then we proactively worked, and continue to work, with our suppliers to reduce the costs associated with IUID. This is accomplished in part by promoting the use of the generic implementation toolsets on the OSD IUID website and encouraging suppliers to refer to OSD guidance regarding alternatives to engineering drawing changes, which are extremely costly. We've made a point of collaborating with government and industry throughout the process." In addition to these activities, Lockheed Martin participated in supplier conferences, industry panels, and symposiums, provided lessons learned, and produced Summary Marking Test Data Sheets that will soon be available on the Defense Acquisition University website.

Looking Forward to the Future

Since the system became operational in February 2005, numerous Lockheed Martin business units have delivered IUID compliant products. The company has submitted over 4,000 error-free IUIDs to the DoD Registry and piloted Government Furnished Property (GFP) IUID data input into the IUID Registry. Because of the internal success of using I-GUIDES, it was decided that it would be offered to industry and government agencies as a Commercial Off the Shelf (COTS) product. In addition, Lockheed Martin has also initiated two IUID/RFID Phase II Optimization pilots which leverage IUID/RFID technologies throughout a value stream, and has supported an aerospace industry pilot program confirming data formats and exchange protocols. Though Lockheed Martin is clearly invested in the technology, Erickson observes it is still somewhat in flux: "The IUID/RFID future states may vary depending on a number of factors. There will be customer-centric differences, like whether it is DoD or non-DoD, business unit-centric differences, and the IUID maturity of the prime, supplier, and sub-tier will also affect future states. There's also the potential for product differences, depending on the percent of new designs, the percent of pre-designed items, the percent affecting engineering drawings, the percent requiring analysis review… there's a number of variables that factor into the equation. Lastly, there might also be shipping differences that impact future state." Yet even with these variables, Erickson looks to achieve even greater benefits from the technology in the future: "Now we have a central location for data mining, so we are well-positioned to support DoD's request for data utilization. We anticipate this will be a great help when it comes to optimization of data in the future."

Please visit www.iuidtoolkit.com for more information