Supporting ground-based weapon systems in the battlefield

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TACOM - Supporting Army Readiness

**SUPPORT**
- Combat Vehicles
- Trailers
- Materiel Handling Equipment
- Fuel & Water Dist Equipment
- Chemical Defense Equipment
- Howitzers
- Mortars
- Machine Guns
- Aircraft Armaments
- Rail
- Fuel & Lubricant Products

**PRODUCT LINES**
- Tactical Vehicles
- Construction Equipment
- Tactical Bridges
- Sets, Kits & Outfits
- Shop Equipment
- Large Caliber Guns
- Rifles
- Ammunition
- Demolitions & Explosives
- Watercraft
- Non-Tactical Vehicles

**MAGNITUDE**
- Capital Value of TACOM Equipment: $81.7B
- 2993 Fielded Systems Supported
- > 26,000 Components

141 Allied Countries own TACOM Equipment
All Army Parent UICs Contain TACOM Supported Equip

Plus Technology Development for the Objective Force

SUPERIOR TECHNOLOGY FOR A SUPERIOR ARMY
The integration of acquisition, technology and logistics systems and processes using open standards for interoperability among enterprise systems.

Definition:
Product Lifecycle Management (PLM)
Is the integration of Engineering PLM and sustainment or logistics PLM
Motivation & Driving Factors

- Many of the current ground weapon systems will continue to be in service for another 20-30 years
  - Need ability to support systems after production
  - Reduce sustainment costs
- Performance Based Logistics emphasizes access to product data on demand and in real-time directly from OEMs
- Need tech data to support RESET/RECAP efforts at depots to meet surge requirements from war effort
- Validated product data critical to the success of various AMC logistics modernization efforts such as Single Army Logistics Enterprise (SALE)
Need for PLM at the US Army

- Army in transformation
- Integrated product data resources through the lifecycle – engineering and logistics
  - Minimize data duplication
  - Single source for technical data
- Multiple organizations – government and private have system responsibility
  - Data exchange and collaboration among organizations is inefficient and time consuming
- Need rapid response to current operations including joint requirements
- Complex system of systems approach to weapons systems
- Improved collaboration with suppliers
- Data on demand in the hands of the war fighter
PLM in terms of DoD Acquisition Framework

Integrated Defense Acquisition, Technology, & Logistics Life Cycle Management Framework

Pre-Systems Acquisition
Systems Acquisition
Sustainment

Joint Capabilities Integration & Development System

A
Concept Refinement

B
Technology Development

C
System Development & Demonstration

IOC
Production & Deployment

FOC
Operations & Support

Concept Decision

Design Readiness Review

LRIP/IOT&E

FRP Decision Review

Defence Acquisition System Framework
Army PLM requirements

- Single point of entry to unified product data
- Federated approach to product data management
- Product data on demand
- Real-time collaboration
- Open PLM architecture for interoperability
- Automated product data management (product structure and BOM)
- Multiple views of product data
- Configuration Management
- Network and security issues (Information Assurance)
- *Integration between engineering and ERP/logistics systems*
Some Army PLM challenges

- Heterogeneous systems and product data formats - interoperability
- Extended systems lifecycle
- Legacy paper-based business processes
- Legacy data
- System of systems engineering
- Spiral development/ Evolutionary acquisition
- Performance Based Logistics
- Parts obsolescence
- Unique disposal issues
Key Technology Enablers

- Federated system of systems for product data management
  - Integrated and logically unified lifecycle product data
  - Single virtual repository for data
  - Enterprise search and view capability
  - Single source of authenticated truth
  - Multiple views of same integrated data depending on function
- STEP PLCS standards (ISO 10303) for enterprise interoperability
- Unique Identification for configuration management and tracking – as-designed, as-built, as-maintained
PLCS Based Product Data Integration

The PLCS Master Data Model integrates lifecycle product data from multiple heterogeneous systems to provide a unified view of product data that flows seamlessly between the enterprise systems.

<table>
<thead>
<tr>
<th>As-Is Product Data</th>
<th>To-Be Product Data</th>
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<tbody>
<tr>
<td>Multiple Army and OEM PDM's</td>
<td>Integrated and unified product data</td>
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<tr>
<td>Multiple disconnected logistics databases</td>
<td>Federated system of systems based PDM</td>
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<td>Stove piped tools and processes</td>
<td>Multiple views of single-source of truth</td>
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<tr>
<td>No configuration tracking</td>
<td>Standards-based for long term data retention</td>
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FALCON architecture for TACOM

TACOM GSIE
- Anniston Army Depot
- Watervliet Arsenal
- Rock Island Arsenal
- Red River Army Depot
- Sierra Army Depot

Federated Army Lifecycle Collaborative e-Nterprise

OEMs
- General Dynamics
  - Land Systems
- AM-General
- United Defense

DLA (BSM)

Program Executive Offices

SALE
Potential Benefits

- Integrated model-based engineering and logistics processes
- New business practices for OEM collaboration, data exchange and contracting based on technology
- Track as-built and as-maintained configurations of ground systems at depots to support reset and recap efforts
- On-demand Interactive Electronic Technical Manuals on portable handheld devices at the hands of the war fighter
- Proactive product improvement based on field feedback and failure history
- Integration of LSAR/ provisioning data with tech data using a structured Bill of Materials
- Up-to-date product data at DLA for procuring consumables by automatic validation against source to reduce acquisition lead times
The HMMWV PLM pilot

- HMMWV is rapidly undergoing changes – not just by AM General the manufacturer
- Need validated and current tech data for major system modifications such as Long Term Armor Strategy, Re-power, seatbelts, cooling, etc.
- Need to be able to pull required product data directly and automatically from AM General’s PDM on-demand
- Much of the HMMWV is available as 3D solid models in Unigraphics format but not completely leveraged for all business processes
- 2D raster drawings on CDs are still used as the exchange format because it is the lowest common exchange format
- Separate as-designed and as-built configurations that have to be resolved and validated
Current Implementation for HMMWV
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