

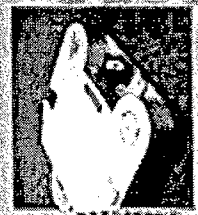
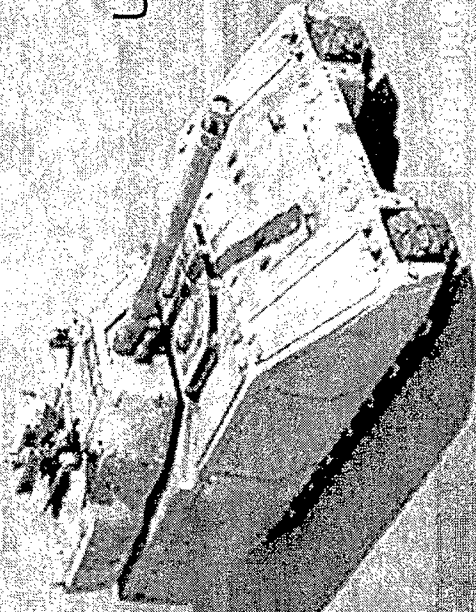
Supporting ground-based weapon systems in the battlefield

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Team Leader, PLM Development

US Army TACOM Lifecycle Management Command,
Warren, MI

Presented at the SME Management Forum on PLM
Troy, MI Dec 8, 2005



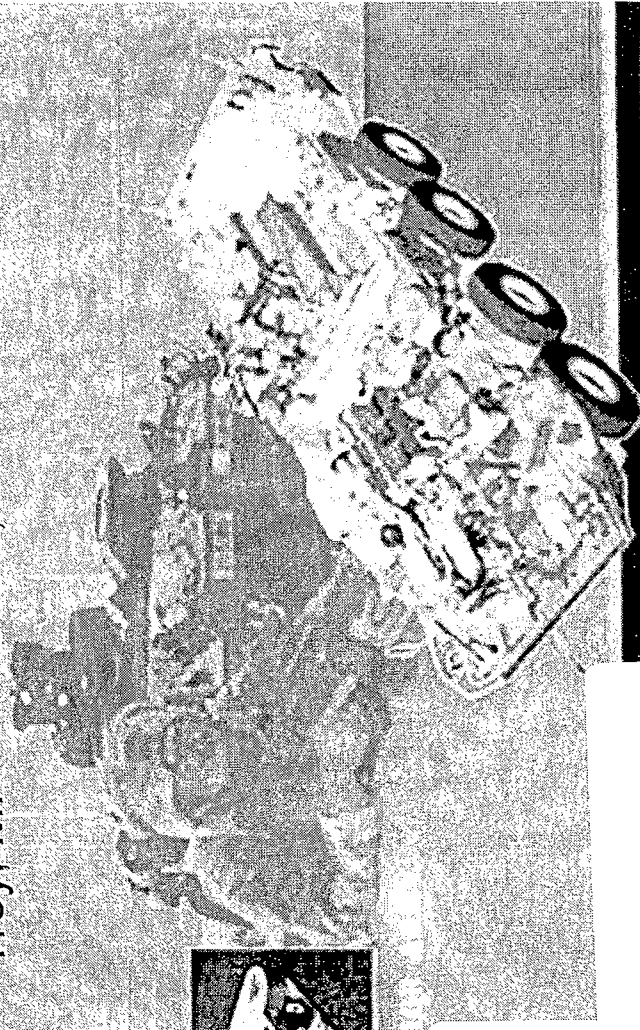
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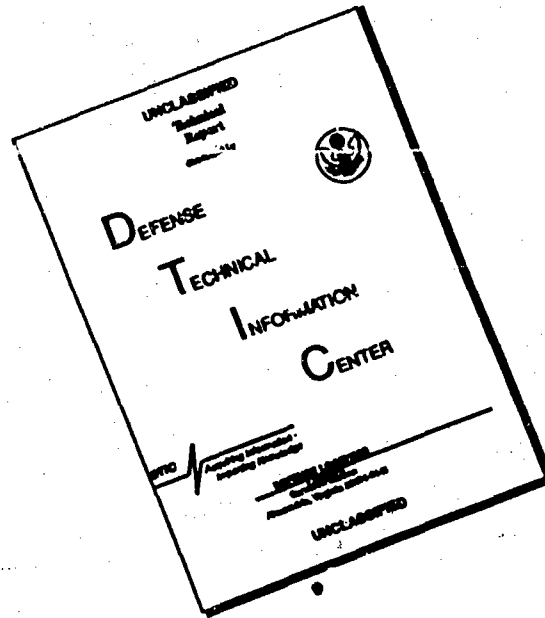
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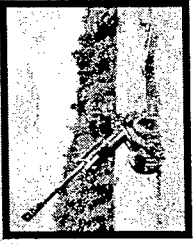
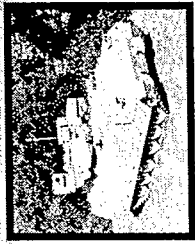
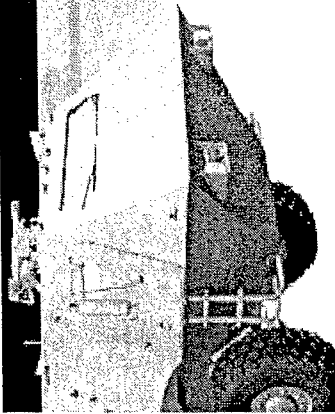


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TACOM - Supporting Army Readiness



SUPPORT

Capital Value of
TACOM Equipment
\$81.7B

2993 Fielded
Systems Supported

> 26,000
Components

PRODUCT LINES

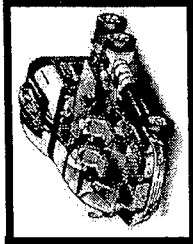
- Combat Vehicles
- Trailers
- Materiel Handling Equipment
- Fuel & Water Dist Equipment
- Chemical Defense Equipment
- Howitzers
- Mortars
- Machine Guns
- Aircraft Armaments
- Rail
- Fuel & Lubricant Products
- Tactical Vehicles
- Construction Equipment
- Tactical Bridges
- Sets, Kits & Outfits
- Shop Equipment
- Large Caliber Guns
- Rifles
- Ammunition
- Demolitions & Explosives
- Watercraft
- Non-Tactical Vehicles

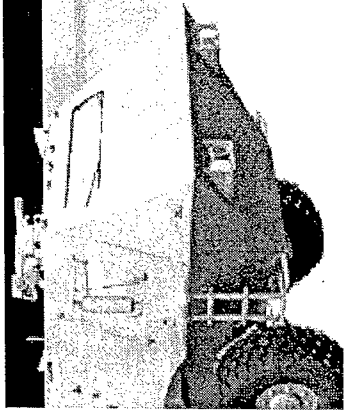
MAGNITUDE

141 Allied
Countries own TACOM
Equipment

All Army
Parent UICs Contain
TACOM Supported
Equip

Plus Technology Development for the Objective Force



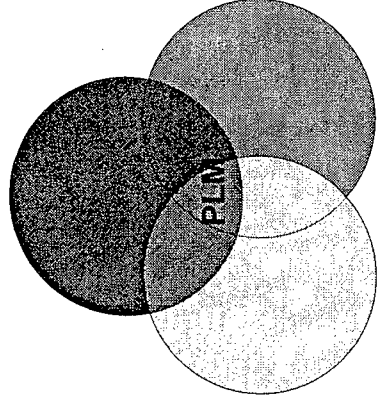


Army Definition of PLM

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

Acquisition



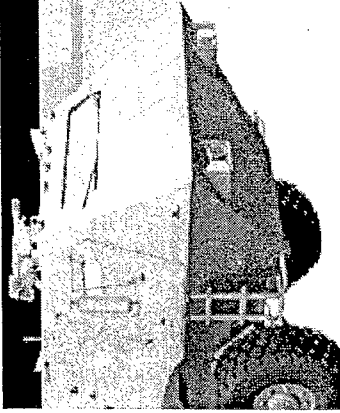
Technology

Logistics



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)

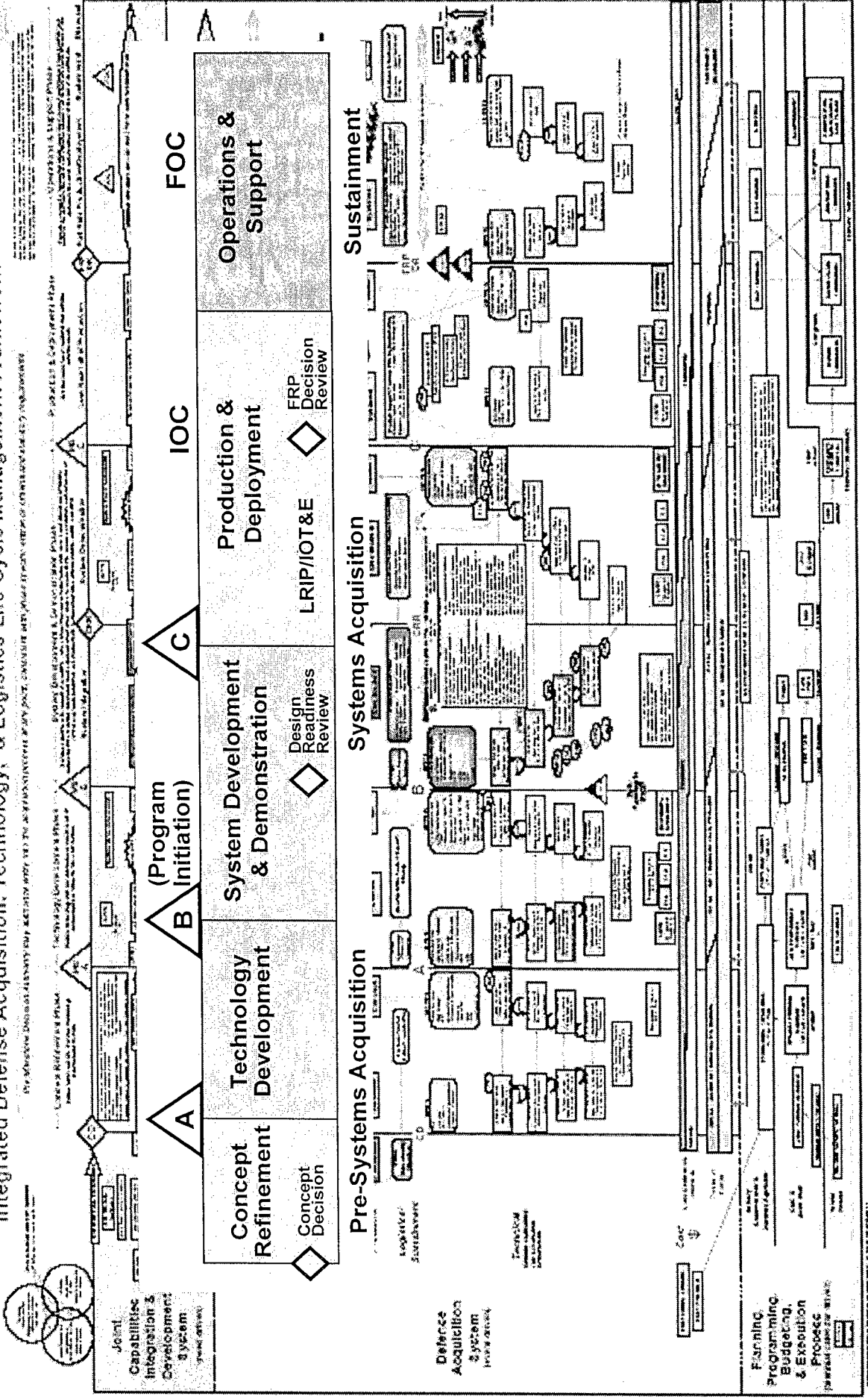


Need for PLM at the US Army

- 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





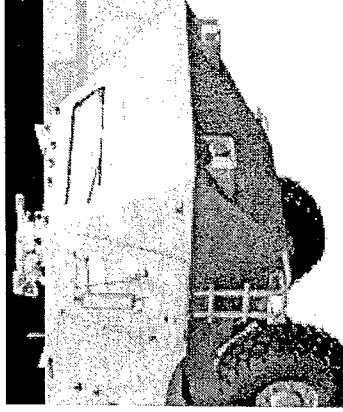
Army PLM requirements

- 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



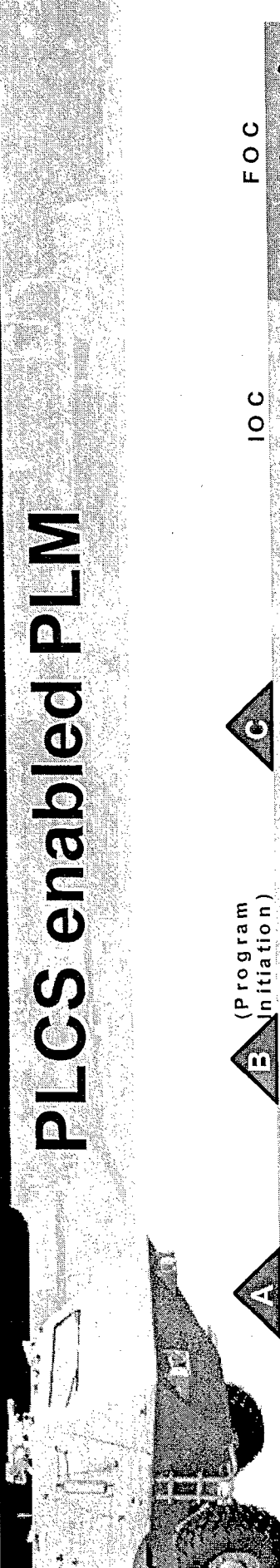
Some Army PLM challenges

- 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

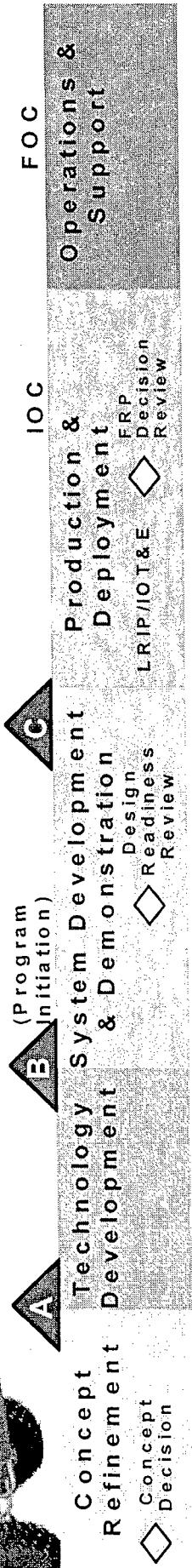


Key Technology Enablers

- 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

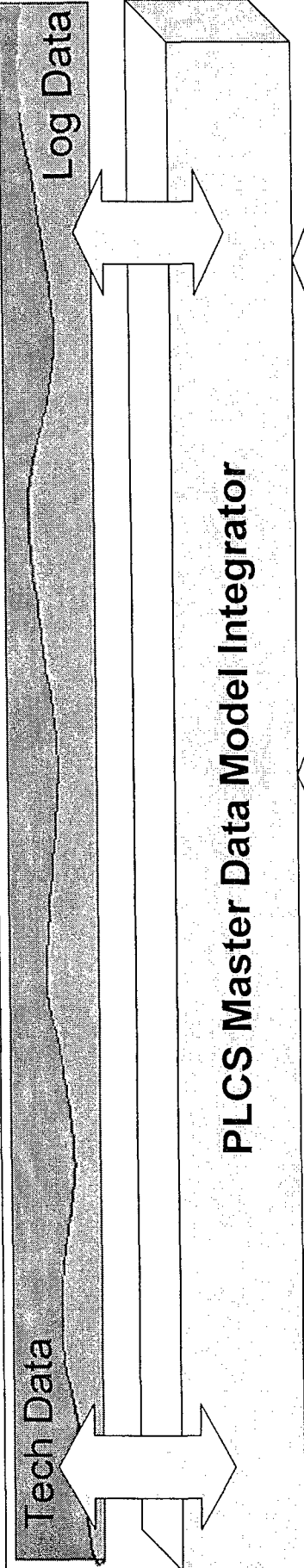


PLCS enabled PLM

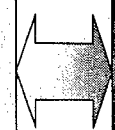


Pre-Systems Acquisition Systems Acquisition Sustainment

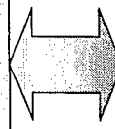
Lifecycle Product Data = Tech Data + Log Data



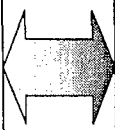
PLCS Master Data Model Integrator



Acquisition/
Engineering PLM



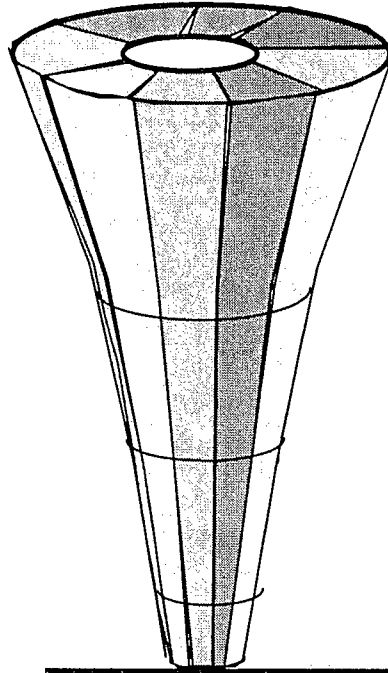
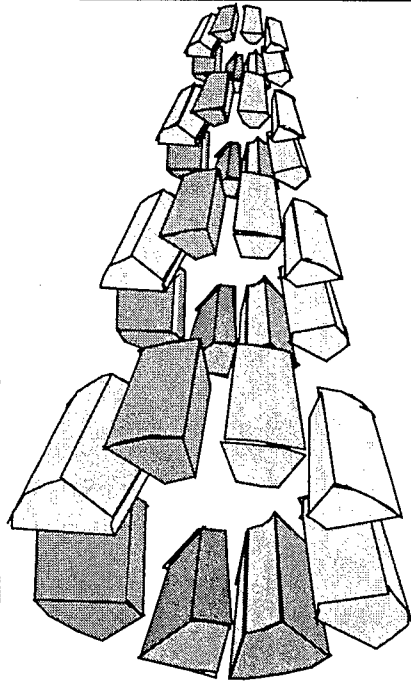
SALE
Logistics/
Sustainment PLM
(Repairables)



Business Systems
Model/Logistics/BSM
(Logistics)

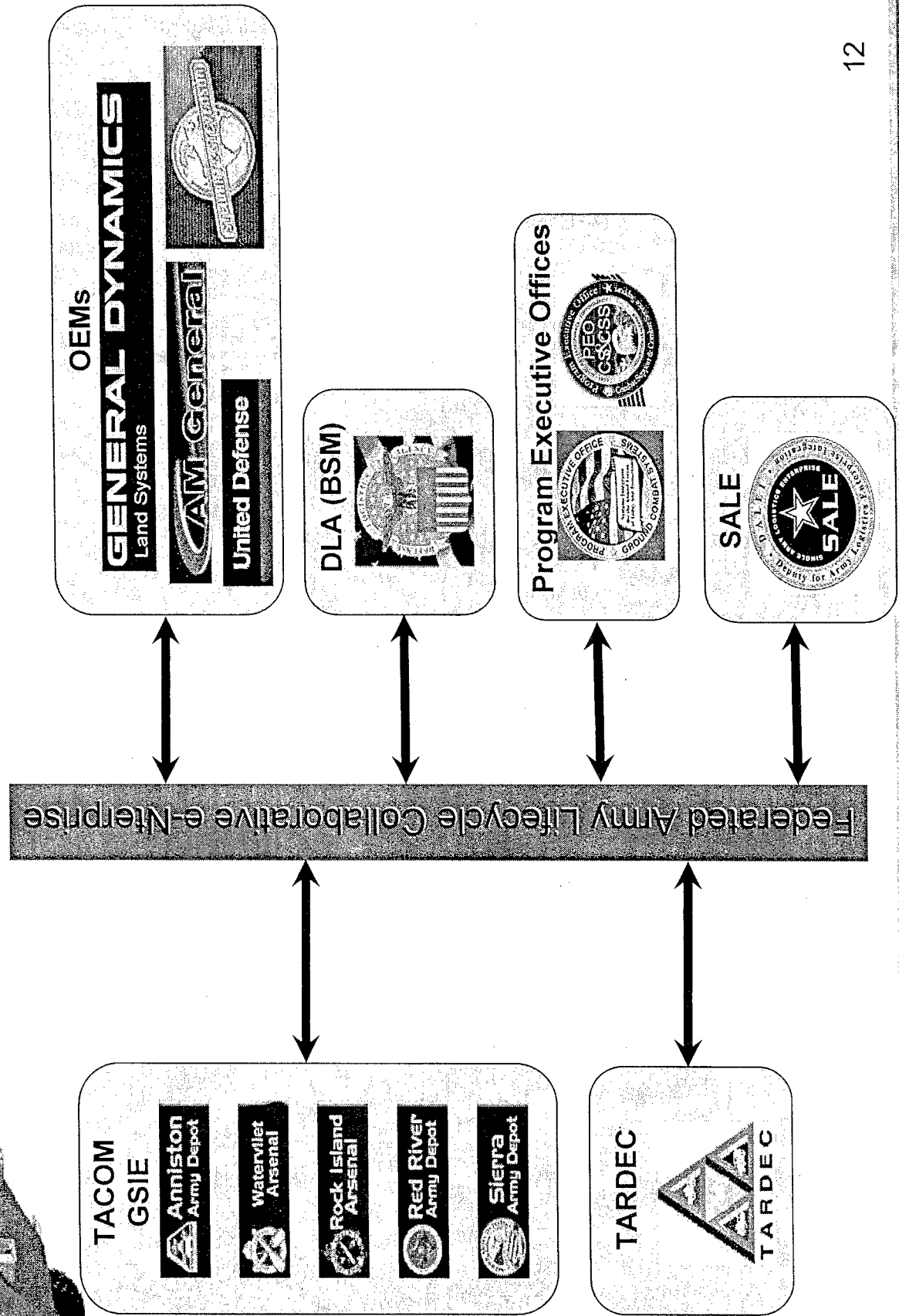
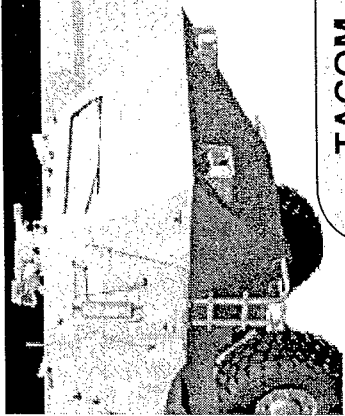
PLCS Based Product Data Integration

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



As-Is Product Data	To-Be Product Data
Multiple Army and OEM PDM's	Integrated and unified product data
Multiple disconnected logistics databases	Federated system of systems based PDM
Stove piped tools and processes	Multiple views of single-source of truth
No configuration tracking	Standards-based for long term data retention

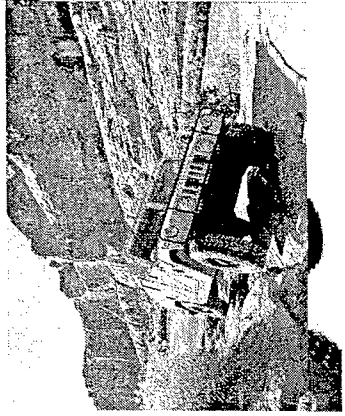
FALCON architecture for TACOM





Potential Benefits

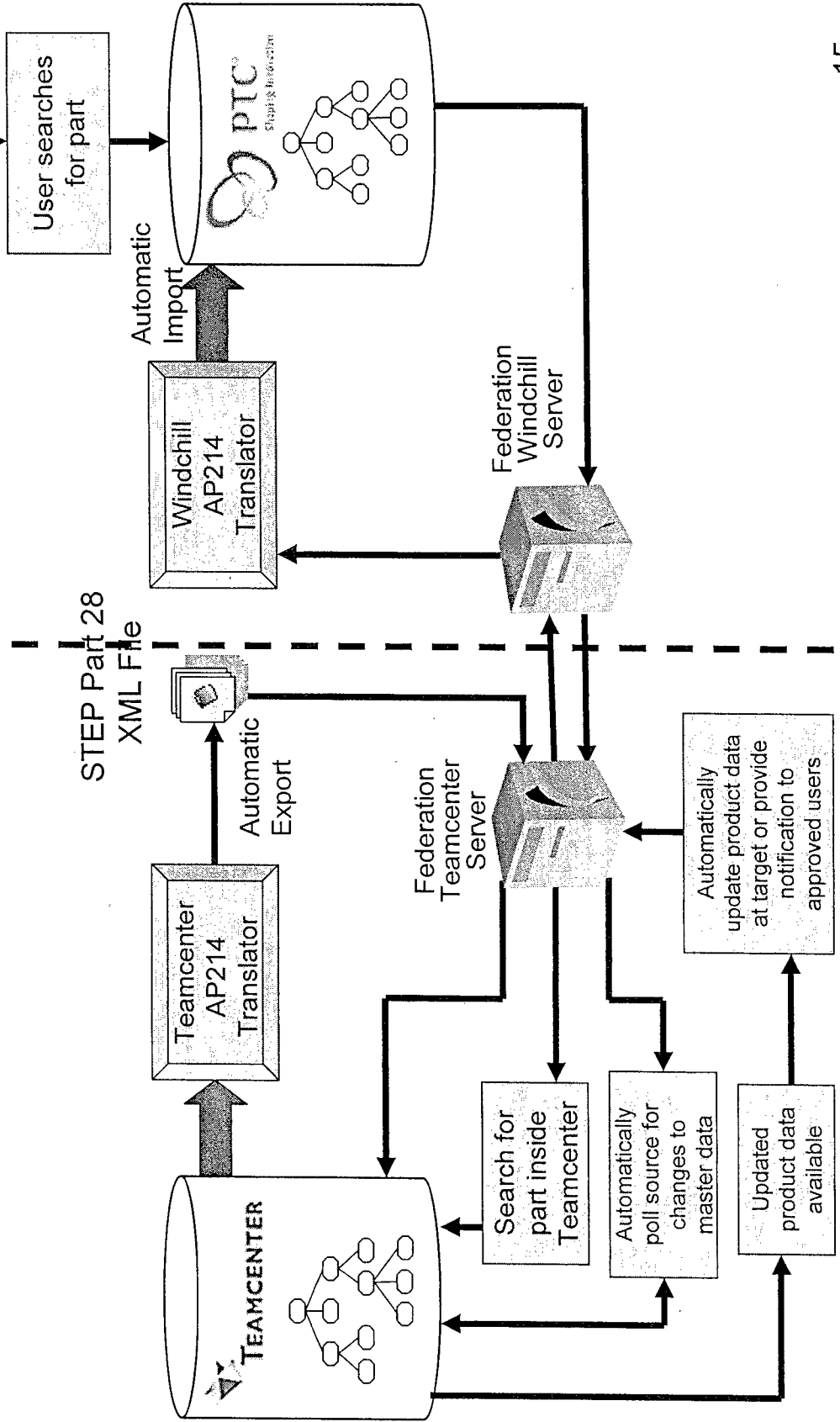
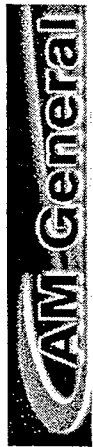
- Integrated model-based engineering and logistics processes
- New business practices for OEM collaboration, data exchange and contracting based on technology
- Track as-built and as-maintained configurations of ground systems at depots to support reset and recap efforts
- On-demand Interactive Electronic 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

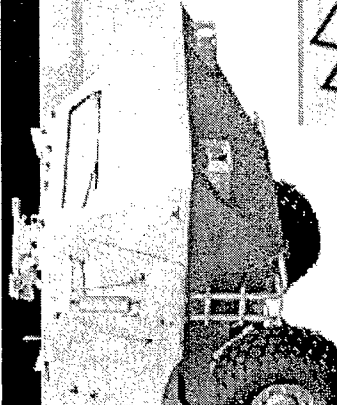


The HMMWV PLM pilot

- 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





FALCON - A Collaborative Effort



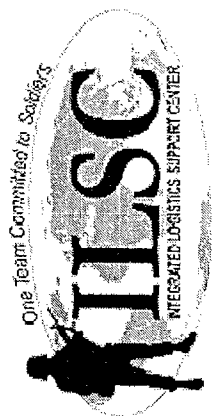
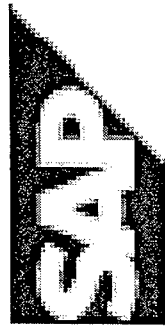
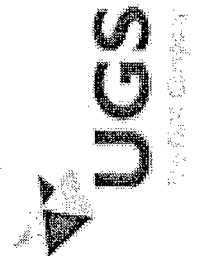
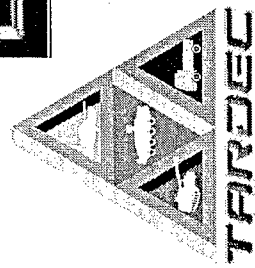
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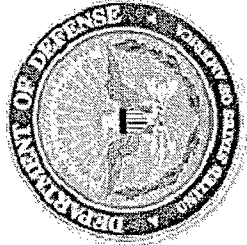
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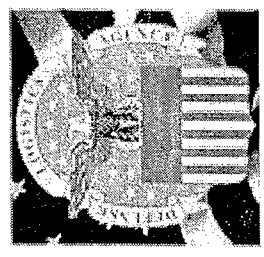
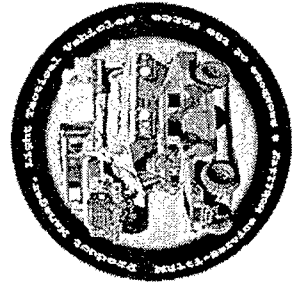
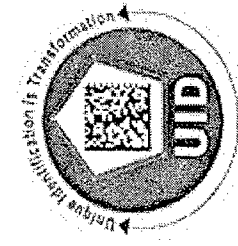
EPM TECHNOLOGY



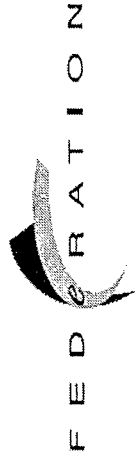
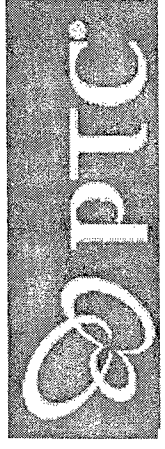
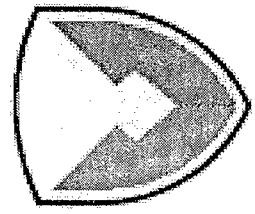
Onle Team Committed to Solving



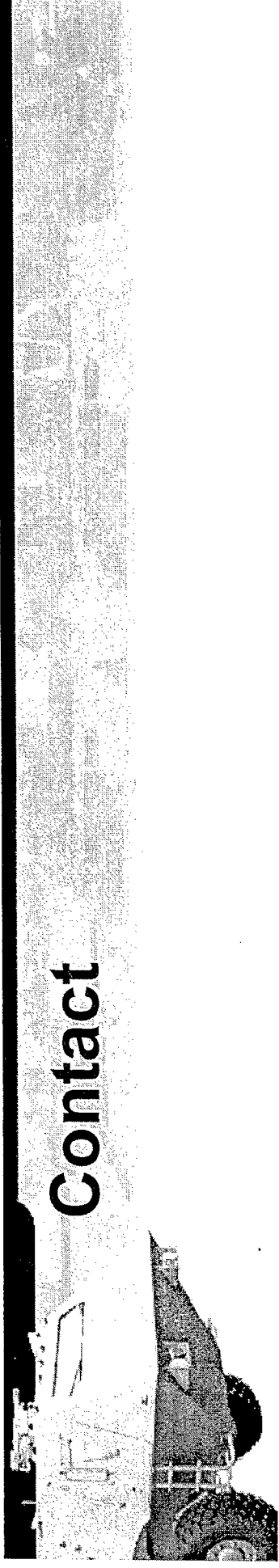
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ENTERPRISE Integration inc.



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Getting the
right technology
in the hands of
SOLDIERS FASTER

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