



U.S. Army Research, Development and Engineering Command



TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

MBE (Model Based Enterprise)
Army Depot Pilot Projects

Rich Eckenrode, RECON Services &
Paul Huang, Army Research Laboratory
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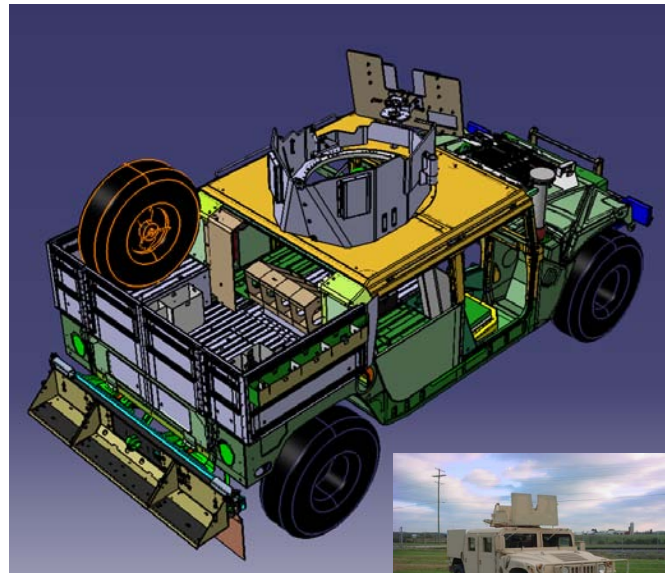
- **Introduction**
- **MBE/MBD overview**
- **How can MBE data be reused at DoD depots**
- **Previous “Digital Depot” projects**
- **Future MBE Opportunities**



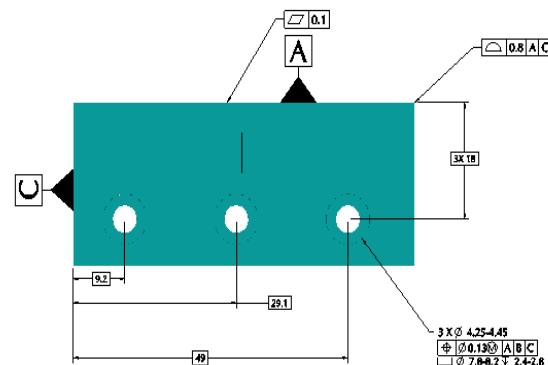
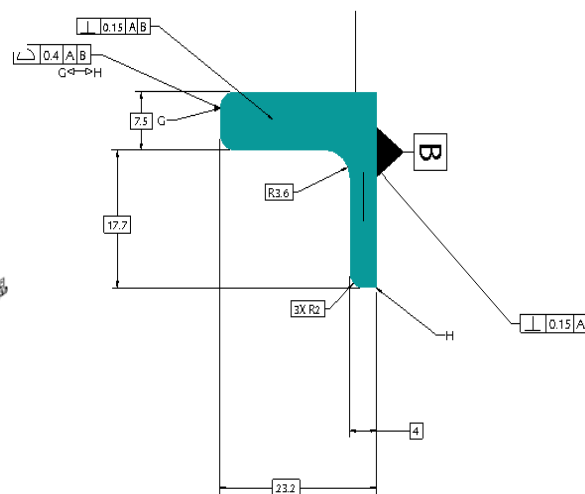
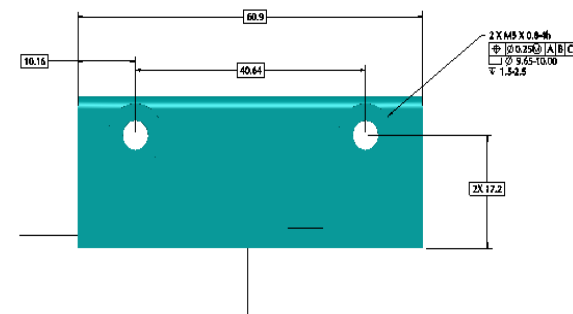
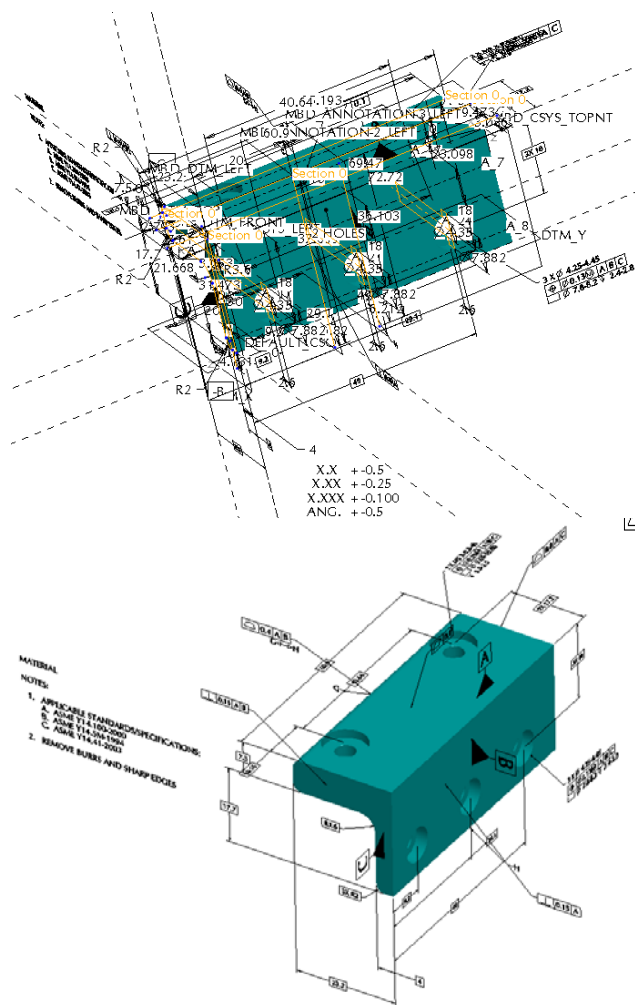
MBE (Model Based Enterprise)



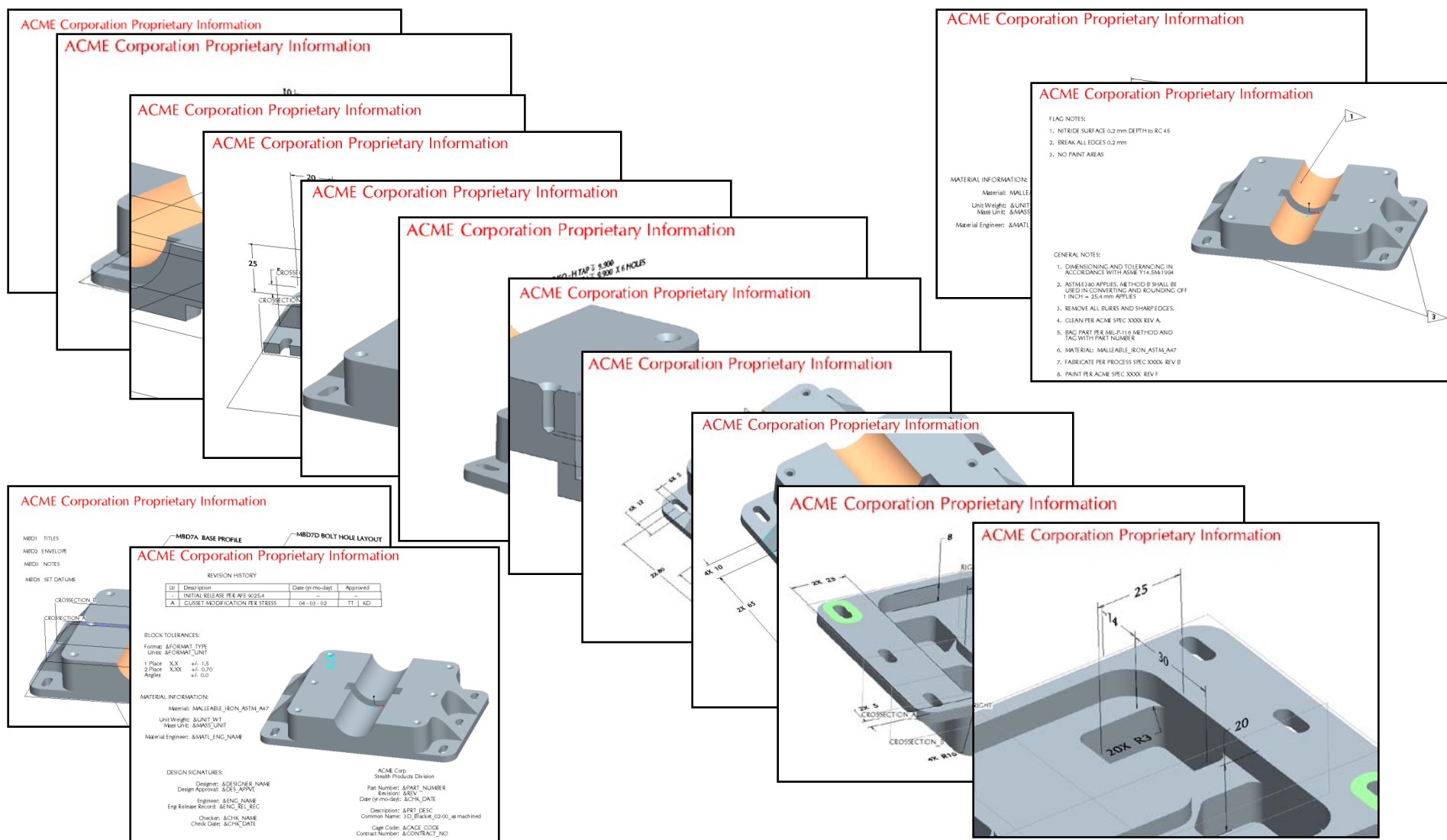
A fully integrated and collaborative environment founded on 3D product definition detail and shared across the enterprise; to enable rapid, seamless, and affordable deployment of products from concept to disposal.



MBD (Model Based Definition)

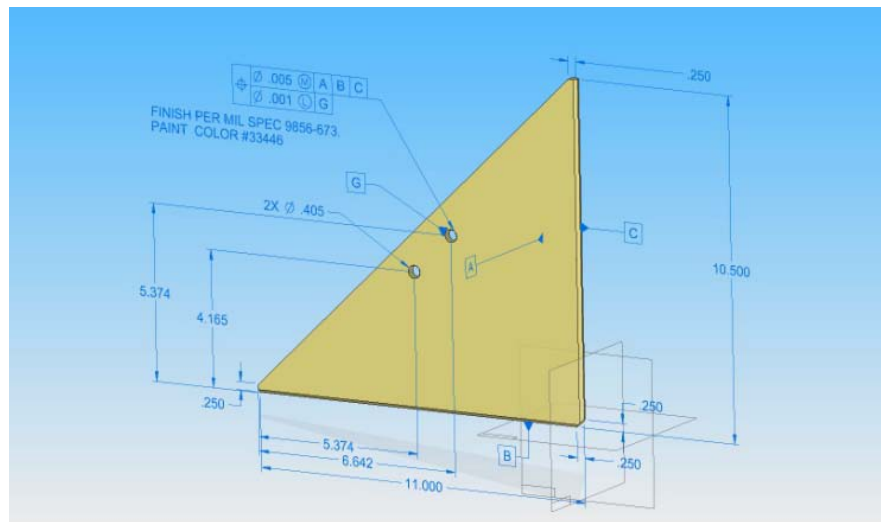
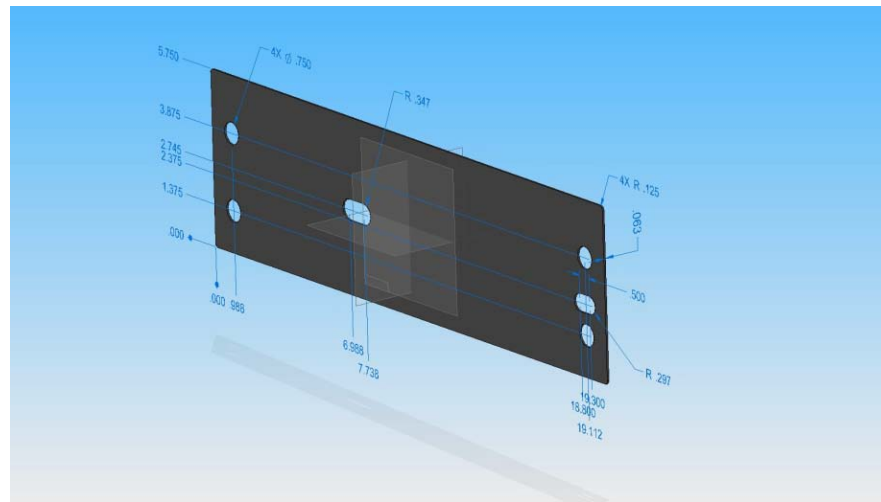
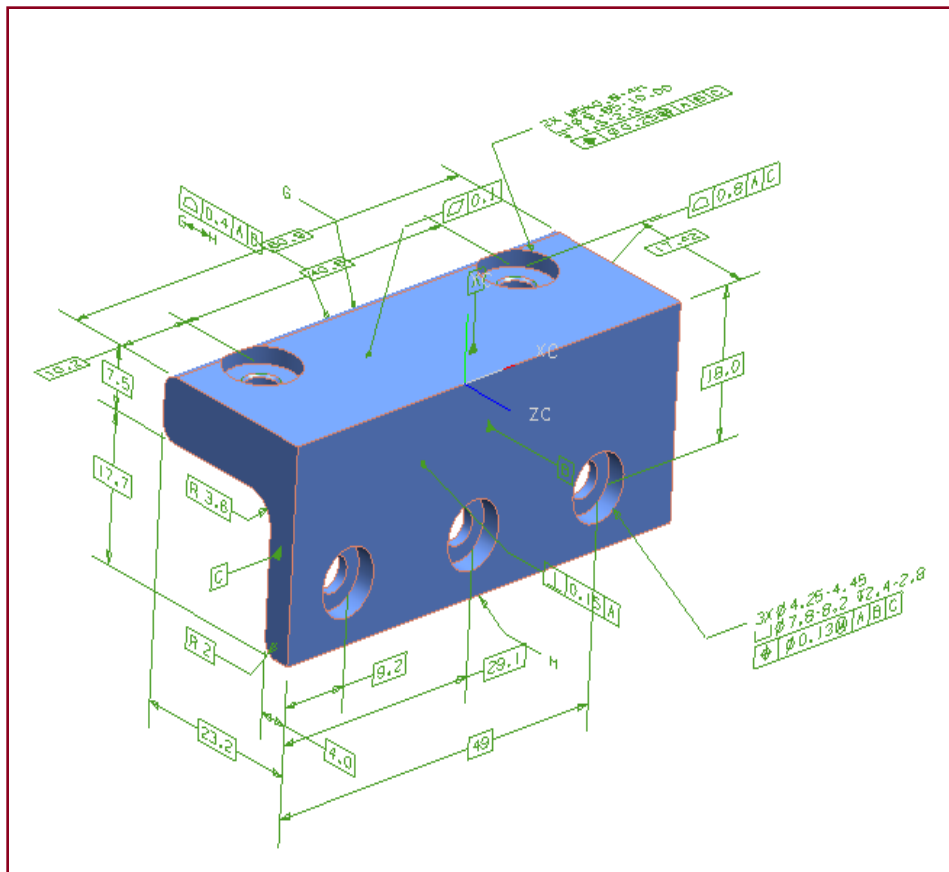


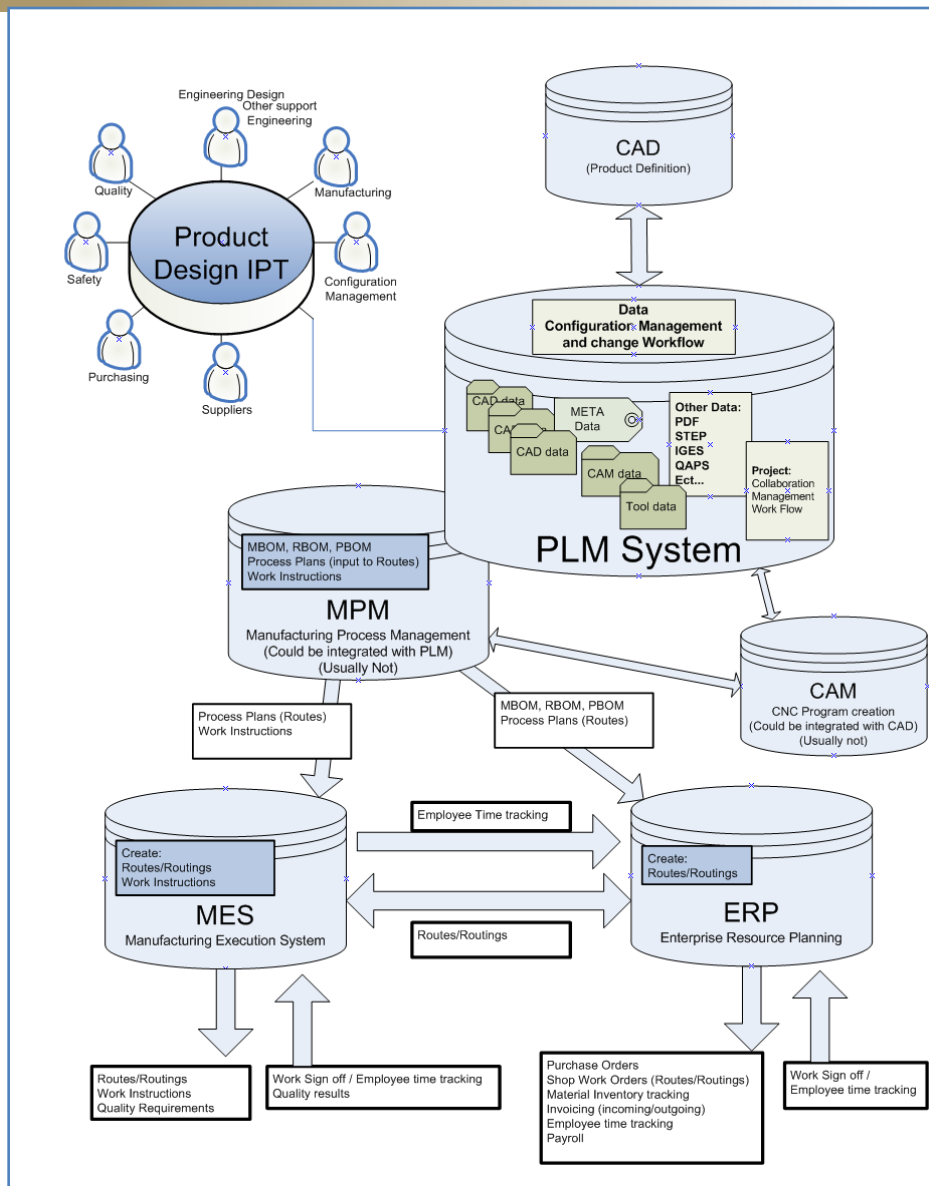
MBD, what it looks like





MBD (Model Based Definition)





- **MPM**
(Manufacturing Process Management)

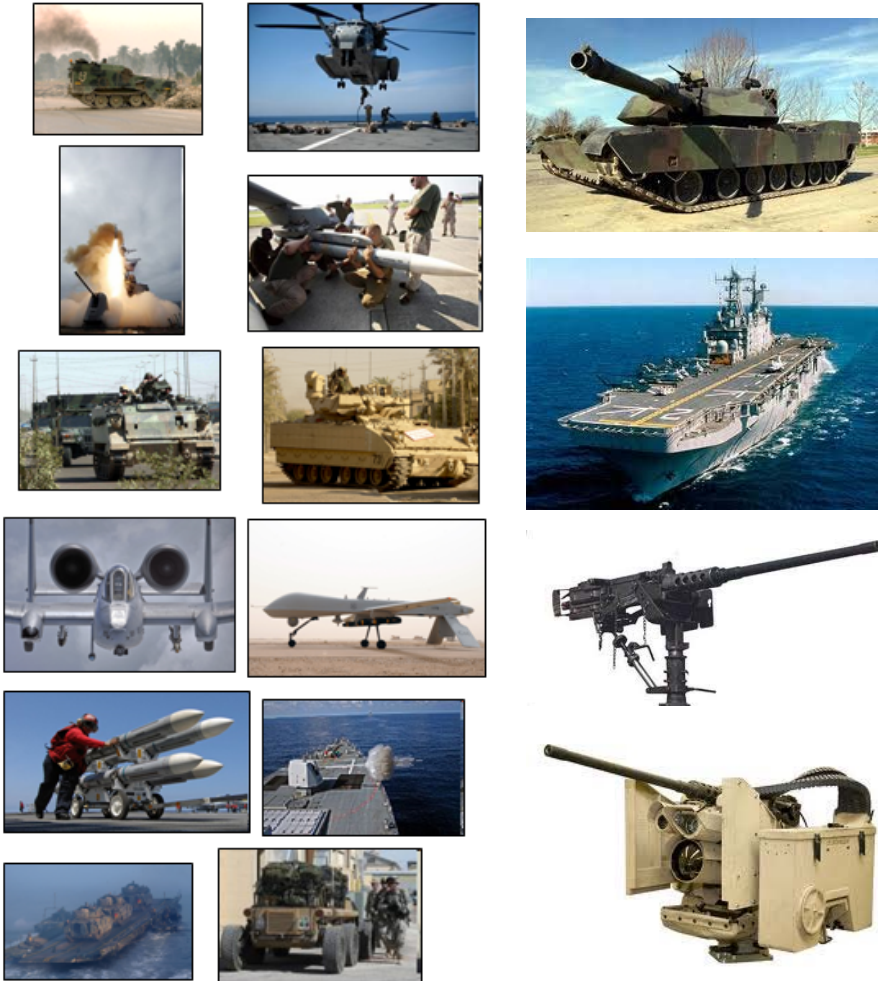
- **BOM Definition**
- **Process Definition (Routes)**
- **Work Instruction**



- **Outputs of Process Planning Activities**
 - **MBOM, PBOM, RBOM, LBOM**
 - Lists of items that need to be procured (purchased or produced)
 - Enter to ERP system for MRP calculations.
 - **Process Plan Sequences**
 - Purchase or produce decision (make/buy)
 - Determine/Verify/Analyze processes (producibility, flow)
 - Prepare plan for entry as a routing
 - Determine and acquire required resources (workspace, workforce, tooling, equipment)
 - **Routes (Routings)**
 - Enter Process Plan into ERP/MES System
(basis of Paper Packets that move with parts through the shop)
 - **Work Instructions**
 - Create Detailed Step by Step sequence Documentation
 - Manufacturing Models/Drawings (as required)



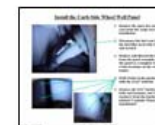
Depots



U.S. AIR FORCE



- Using outdated methods
- Same planning methods that were used 50 years ago
- Sometimes TDP does not exist
- Disassemble and reassemble vehicles while documenting the processes
- Best guess efforts usually require re-thinking to implement best solution

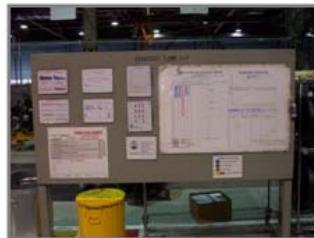


Photos courtesy of LEAD

Depot Lean Teams



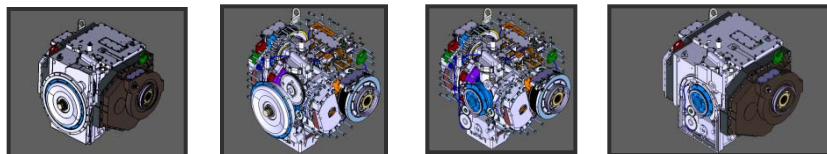
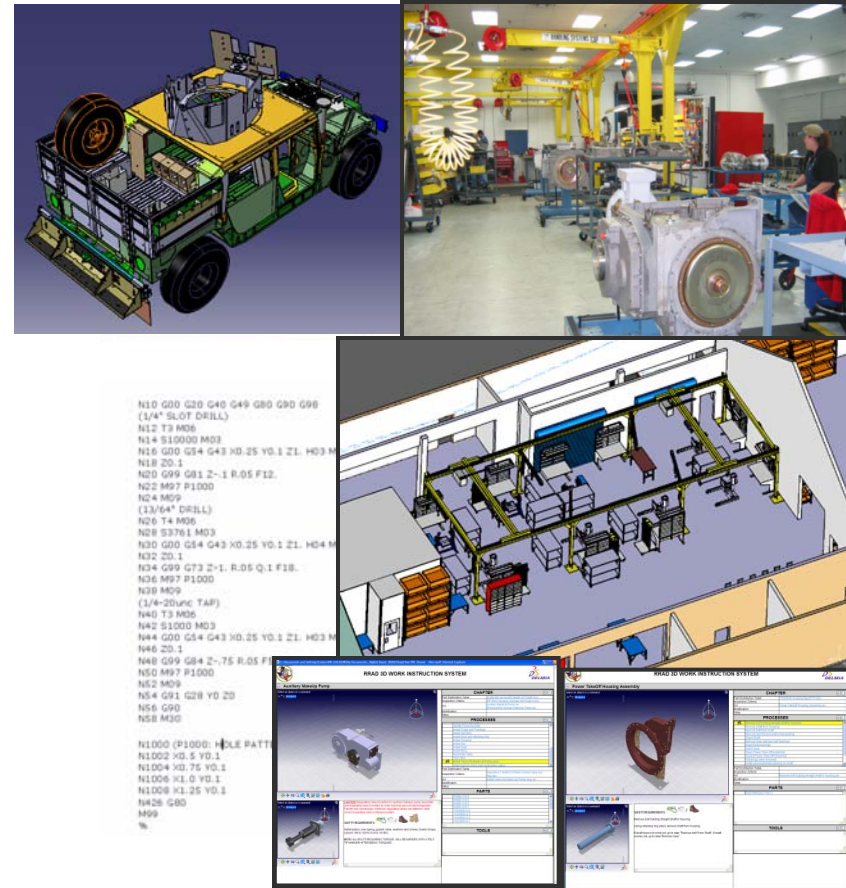
- After initial production start
- Improves Layout
- Improves factory flow
- Requires investment to implement
- Multiple Lean events require multiple investments



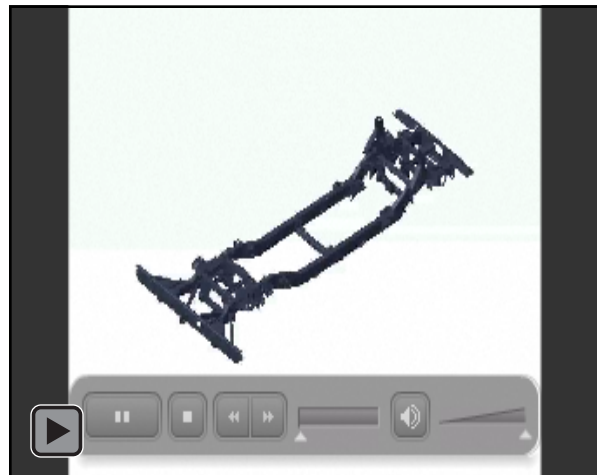
Photos courtesy of LEAD

Not for Distribution

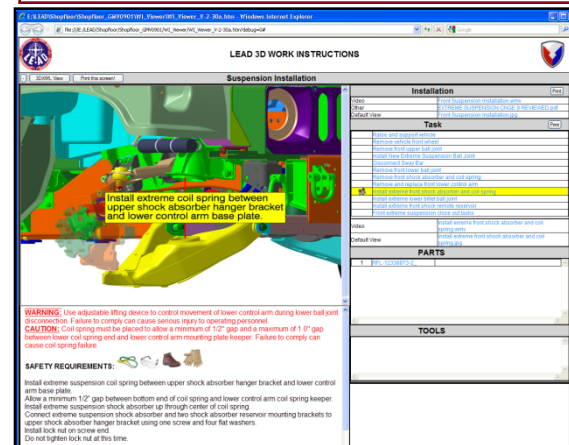
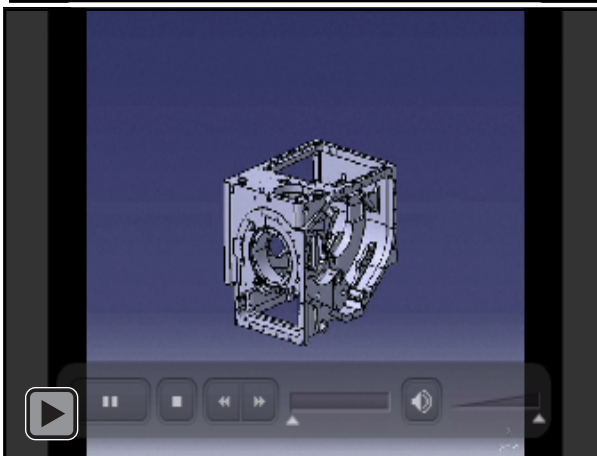
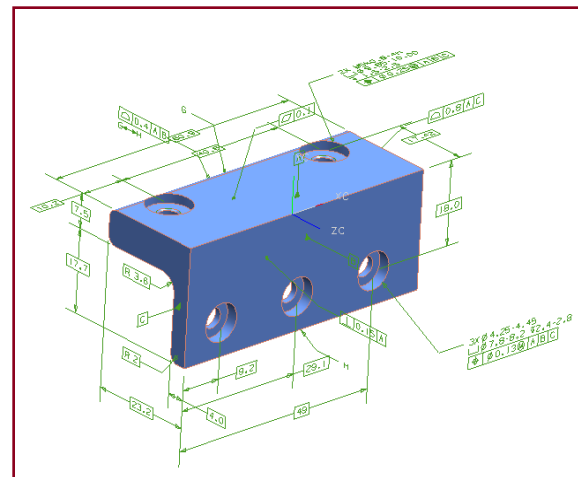
- Prior to initial production start
 - Process plans without test article
 - Optimize layout
 - Optimize factory flow
 - Create work instructions
- Simulate processes and prove out in pixels rather than in brick and mortar
- Complete multiple simulation scenarios in order to determine best possible processes



MBE Reuse Examples

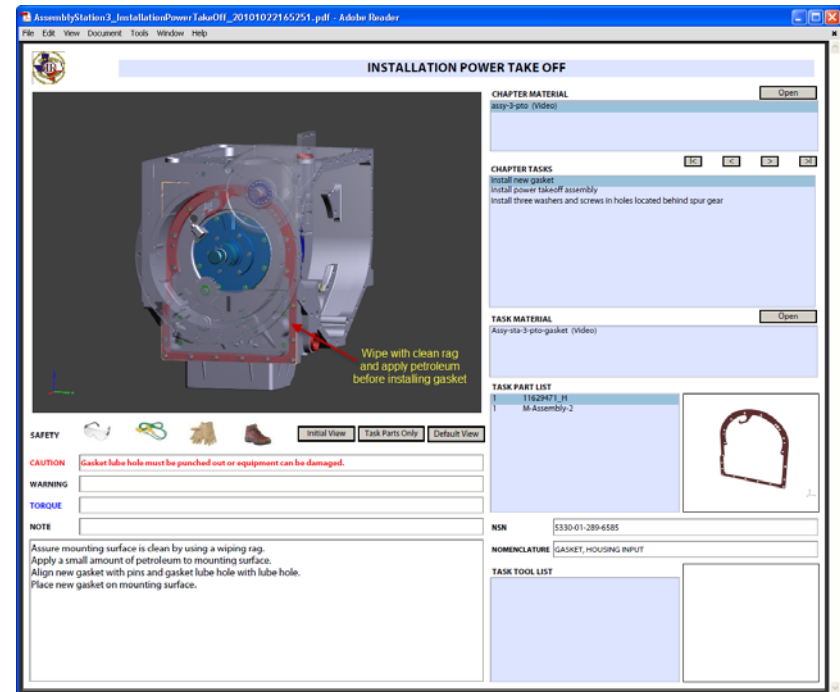
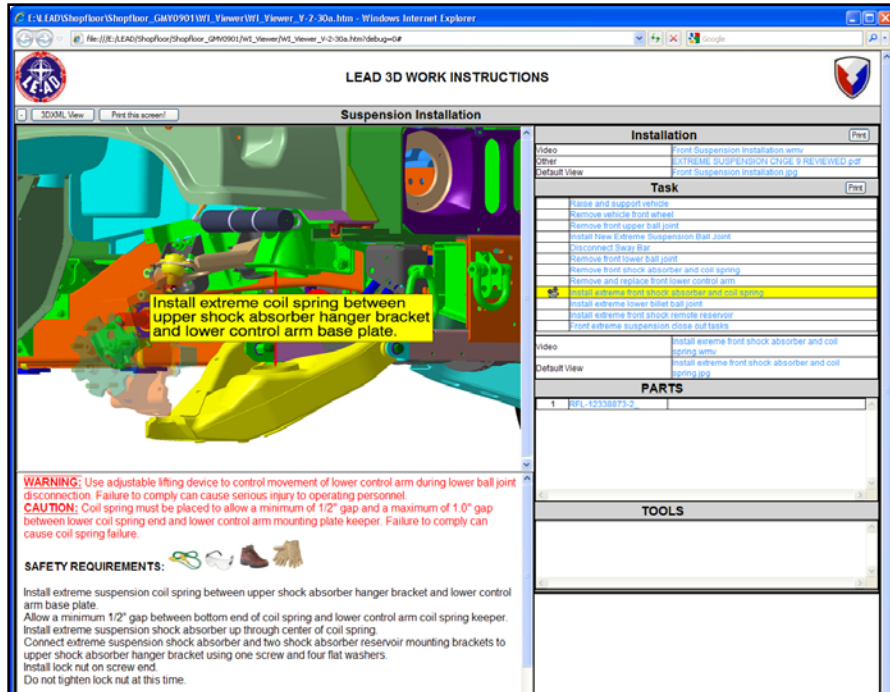


- **Product Definition**
- **Process Definition**
- **Physical Analysis**
- **Statistical Analysis**





Focused on providing MBE Tools and Knowledgebase to depots to begin to instill an Army organic ability to reuse MBE data.






- **Outputs of QA Planning Activities**
 - **Overall Program Quality Plan**
 - **System Test and Validation Procedures**
 - **First Article Plans**
 - **Non-conformance Procedures**



First Article Plans

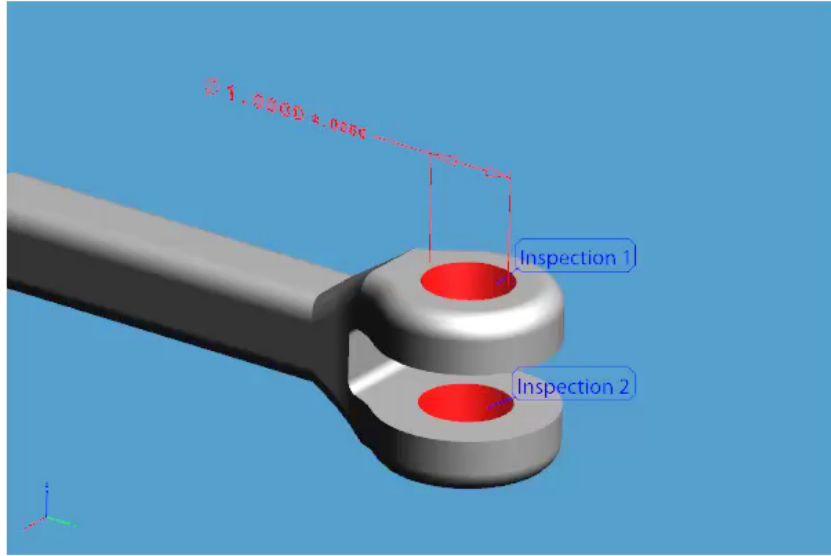


- Documents can be created that allow verification to be recorded and communicated back to a server.

**ANARK**

First Article Inspection Document

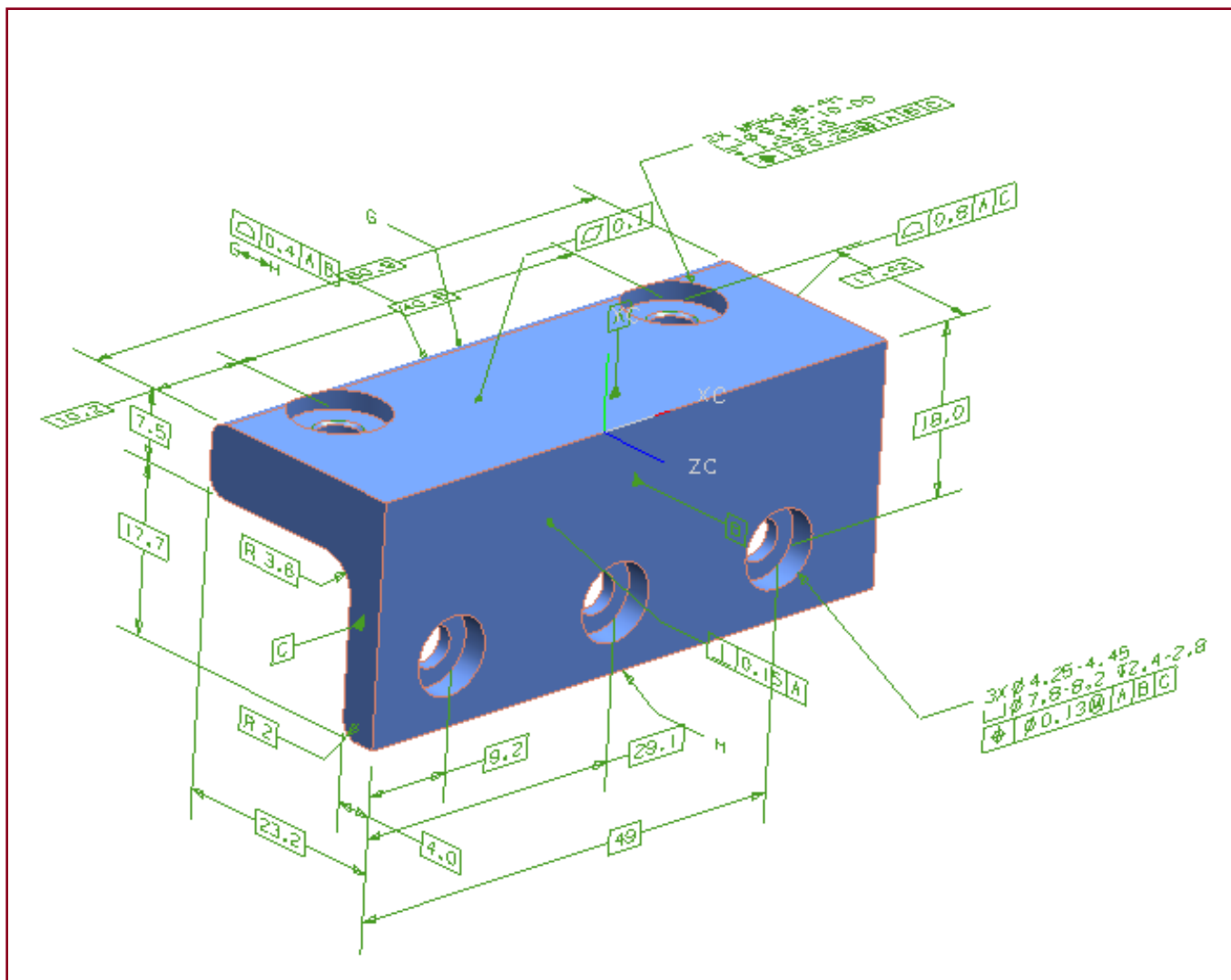
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Part/Drawing Number	12896553	Bldg Num	1
Rev Number	7001		
Serial Number	125-365-9968-23		



KEY CHARACTERISTIC TOLERANCES	INSPECTED DIMENSIONS
Diameter Tolerance: 1 of 2 Diameter Tolerance: 2 of 2	Measure the inside diameter of the part using inside micrometer
	Diameter Tolerance: 1 of 2 1.0000
	Tolerance 0.0050
	Measurement
	Deviation
	<input type="button" value="Commit"/>
	Inspector's Name <input type="text"/>



Semantic PMI Data





Questions?

