

IUID-Enabled SIM within the DoD Maintenance Enterprise

UID & eBusiness Forum



Ron Durant
Research Fellow, LMI
Supporting
OADUSD (MP&P)

9 April 2008

Session Objectives

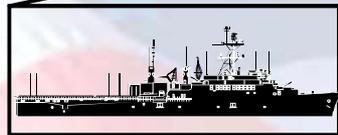
- 1. Describe the scope of the DoD maintenance environment**
- 2. Describe the significance of maintenance transformation**
- 3. Introduce a revised Implementation Pathway**
- 4. Define SIM and delineate it from SNT**
- 5. Describe the role and position of IUID-enabled SIM relative to TLCSM**
- 6. Discuss some of the implementation challenges**

DoD Maintenance Enterprise

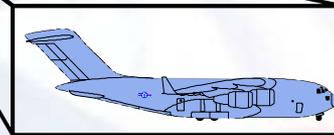
~ 330,000 Vehicles



~ 900 Strategic Missiles



~ 280 Ships



~ 14,000 Aircraft/Helicopters

- + Communications/Electronics Equipment
- + Support Equipment
- + Other Systems

Maintained by:

- 654,000 DoD personnel
- Private sector companies

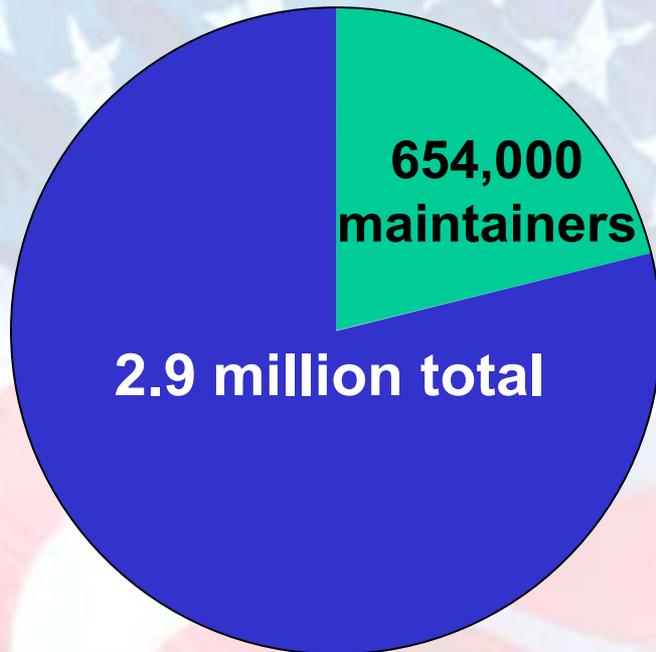
**Maintenance cost:
~ \$87 billion per year**

> 100M Candidate UID Parts

National Defense Inventory is valued at ~ \$345B

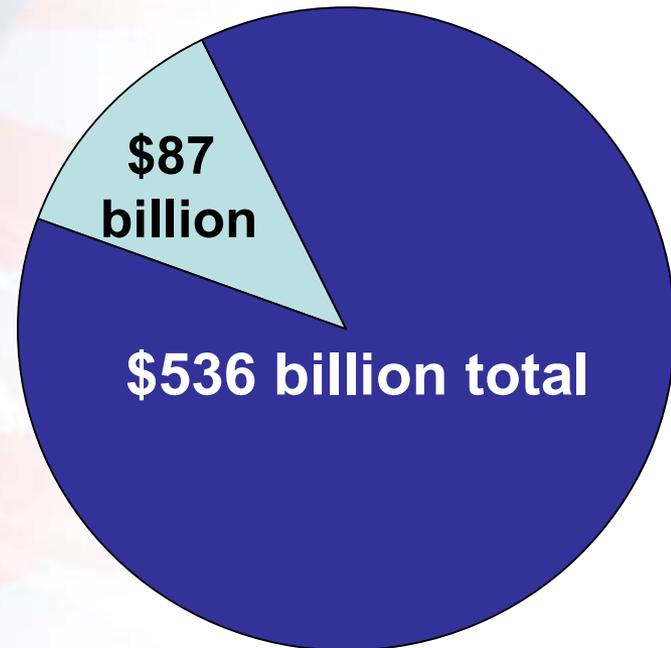
Maintenance Personnel & Budget

DoD Personnel



23% maintainers

DoD Budget



16% spent on maintenance

Sources: FY2007–FY2011 President's Budget and
LMI analysis of Defense Manpower Data Center FY2005 data

Personnel Strength of Field- and Depot-Level Maintenance

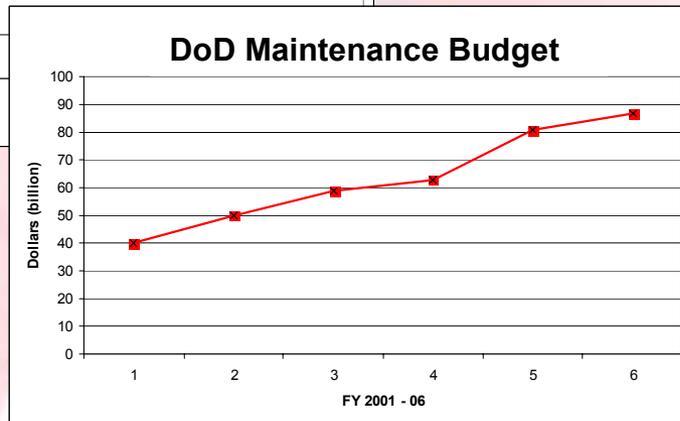
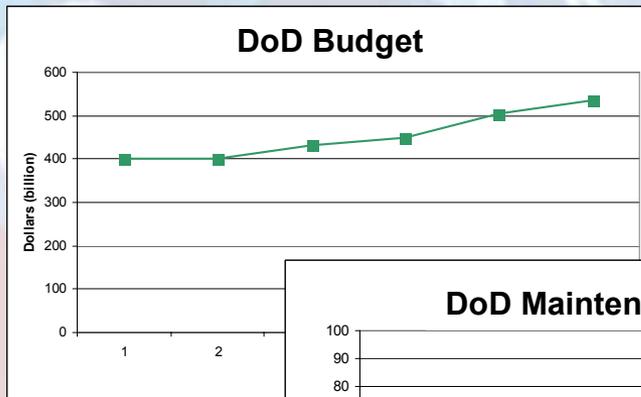


Source: LMI analysis of Defense Manpower Data Center
and Joint Depot Maintenance Activity Group data for FY2005

Life Cycle Framework - Maintenance Cost Trend



Sustainment is 65 - 80% of the Lifecycle Cost



Maintenance costs are escalating!

- \$40 billion in FY-01 to \$87 billion in FY-06
- **25% increase in maintenance budget from FY-01 to FY-08 (constant FY 08 dollars)**

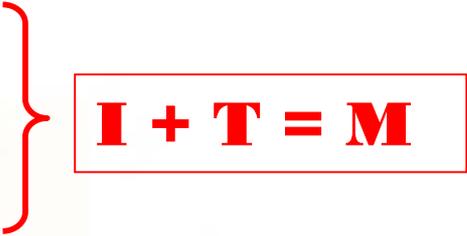
Maintenance is increasing as a percentage of the total DoD budget!

- 14% in FY-03 to 16 % in FY-06

Maintenance Needs to Transform!

OSD Strategy:

- **Promote End-to-End (E2E) Materiel Readiness Value Chain Perspective across DoD**
 - **Balance Safety, Reliability, Maintenance and Supply Distribution activities to achieve optimal materiel readiness at best cost.**
 - **Optimize “TIME-ON-WING” and “TURN AROUND TIME”**
- **TLCSM**
 - **Sustain Optimal Materiel Condition & Reliability**
 - **Sustain Optimal Support Cost & Cycle Time**


$$\mathbf{I + T = M}$$

IUID is the Trigger

USD(AT&L) Policy Memo 29 July, 2003


OFFICE OF THE UNDER SECRETARY OF DEFENSE
3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000
JUL 29 2003
ACQUISITION
POLICY
AND
CONTROL

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Policy for Unique Identification (UID) of Tangible Items - New equipment, Major Modifications, and Replacements of Equipment and Spares

Unique Identification (UID) is a mandatory Department of Defense (DoD) requirement on all solicitations issued on or after January 1, 2004. I strongly encourage the Component Acquisition Executives to incorporate this policy into ongoing contracts where it makes business sense to do so.

Contracts shall require unique item identification, or a DoD recognized unique identification equivalent, for all property items delivered to the Government if: (1) the acquisition cost is \$5,000 or more, (2) it is either a serially managed, mission essential or controlled inventory piece of equipment or a new cable item, or a consumable item or material where permanent identification is required, (3) it is a component of a delivered item, if the program manager has determined that unique identification is required, or (4) a UID or a DoD recognized UID equivalent is available. Existing government furnished property provided to contractors is exempt from this policy until January 1, 2005 when this policy becomes mandatory for all government furnished property incorporated into an item. Unique identification will comply with the Department's existing policy on serialized item management.

Component Acquisition Executives (CAEs) shall ensure their program managers understand the criticality of requiring UID and integrating this change into the appropriate business processes. All program managers for new equipment, major modifications, and replacements of equipment and spares shall begin planning to apply Unique Identification (UID) on tangible items using the attached guidance. Wide Area Workflow (WAWF) will be modified to capture the UID associated with each item. DoD Components are expected to transition rapidly to the WAWF as a mandatory payment requirement by no later than January 1, 2005. I encourage the CAEs to promote and fund pilot programs to apply UID to legacy equipment and their supporting AISs. A Item Implementation Requirements Based for UID will be established. This Based will focus on business rules for enabling all AISs to use the UID as a primary or alternate key to achieve a globally interoperable network-centric architecture for the integrated management of tangible items.

The Department, along with its industry and international partners, clearly defines use of constructs described in ISO/IEC 15424 to achieve interoperability in business intelligence. However, this requires ISO approval to add a new format to ISO/IEC 15424.



- **New tangible items**
 - Begin NLT 1 Jan 2004
 - commercial purchases
 - Begin NLT 1 Jan 2005
 - depot manufactured items

USD(AT&L) Policy Memo 23 December, 2004


THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010
DEC 23 2004
ACQUISITION
AND
CONTROL

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Policy for Unique Identification (UID) of Tangible Personal Property Legacy Items in Inventory and Operational Use, Including Government Furnished Property (GFP)

Effective immediately, this policy update establishes the requirement to apply UID to existing personal property items in inventory and operational use, that is, legacy items. In addition, the policy is formally extended to specifically include items manufactured by organic DoD depots. This policy for legacy personal property items does not impact the mandatory UID DFARS clause to be included in all new solicitations and contracts issued after January 1, 2004, as stated in my UID Policy Memoranda.

UID will be a cornerstone of DoD Business Transformation. Therefore, I request that the Military Departments direct all program and item managers to plan for and implement UID for existing legacy personal property items in inventory and in operational use. UID plans should take an evolutionary approach, as I understand there are physical and resource concerns. ACAT ID programs must submit UID program plans to the UID Program Office by June 2005. All other programs must submit plans to their respective Milestone Decision Authorities by January 2006. Periodic reviews of the UID program plans will be conducted by the respective Milestone Decision Authorities.

The plans should target Fiscal Year (FY) 2007 as the point by which: (a) all existing serialized assets that meet the criteria for UID have been entered in the UID registry, and (b) UID marking capabilities have been established for all existing items and embedded assets such that marking can commence as applicable equipment are returned for maintenance. I request that all program and item managers plan to complete UID marking of items and all applicable embedded assets within existing items by December 31, 2010, using the planning guidelines included in the attachments. It is recognized that programs will have different levels of completion by 2010 because failed items will not be removed from service for the sole purpose of UID marking. In addition, programs or items that will be phased out of inventory by December 31, 2010, should be set apart in the plans for an exception to the UID requirement.



- **Legacy items in inventory**
 - IOC Jul 2005
 - pilot depots
 - Complete NLT Sep 2007
 - all existing serialized items
 - Complete all items NLT Dec 2010

UID is a DoD Strategic Imperative

UID is strategically critical to:

- Always know what property the DoD owns
 - Definitely know what it is
- Always be able to account for it
 - Know **where** it is
 - Know **who** has custody of it
 - Know **who** is accountable for it
 - Know **how** it has been **used & maintained**
 - Know what it cost
 - Know its current value

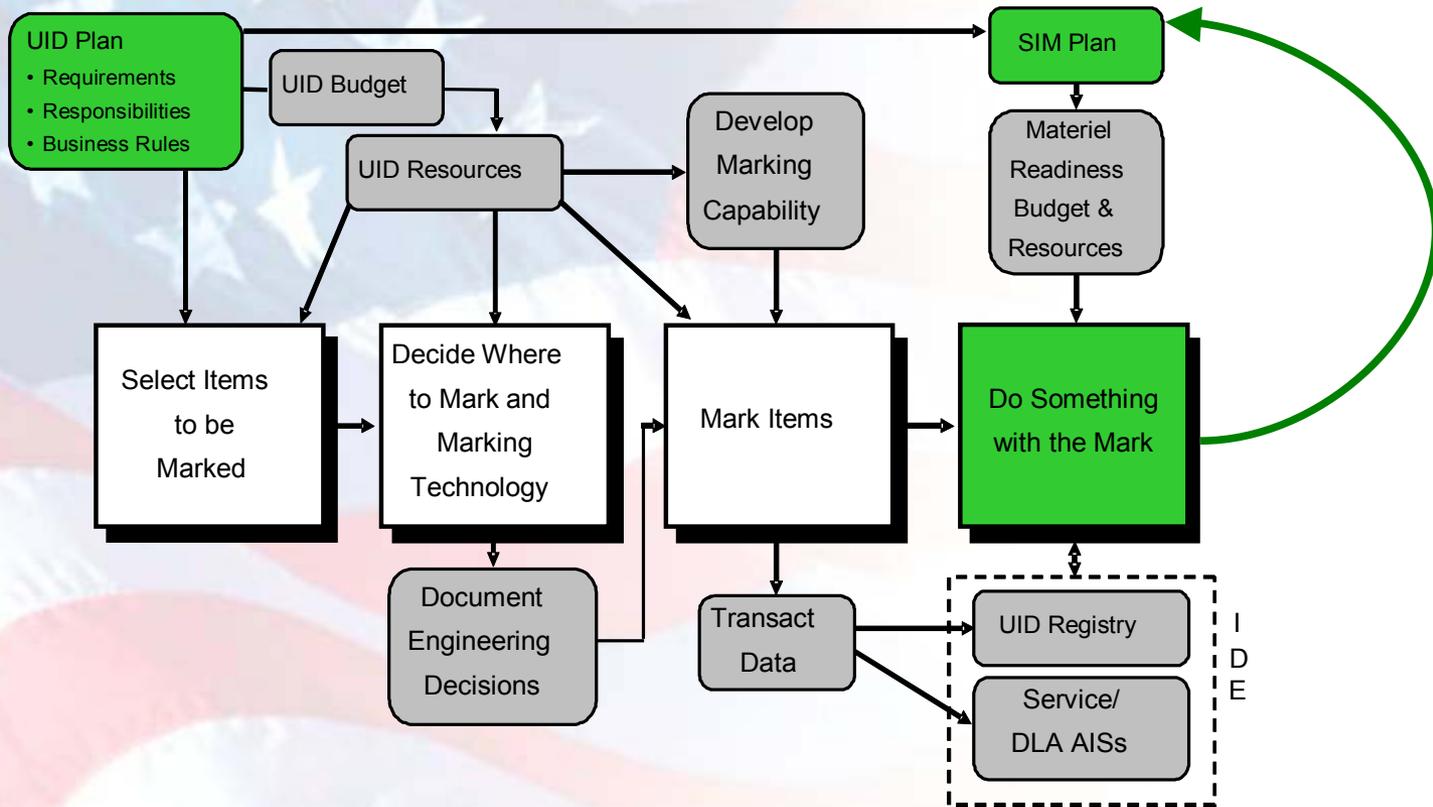
UID PROGRAM

SIM

- And use this information to:
 - Enable capability-based **readiness**
 - Support planning, forecasting, and budgeting
 - Identify gaps in capabilities
 - **Improve reliability** and warranty management
 - Streamline logistics processes
 - **Reduce cycle time**

Implementation Pathway

DO SOMETHING WITH THE DATA!



SIM as a Requirement

Based on DoD Directive 4151.18 stating the use of SIM (para 3.2.5)

Dec 2006, DODI 4151.19 *Serialized Item Management (SIM) for Materiel Maintenance is issued*

- 1.1. **Identify** populations of select items (parts, components, and end items).
- 1.2. **Mark** all items in each population with a unique item identifier (UII).
- 1.3. **Generate, collect, and analyze** maintenance, logistics, and usage data about each specific item.

SIM Purposes

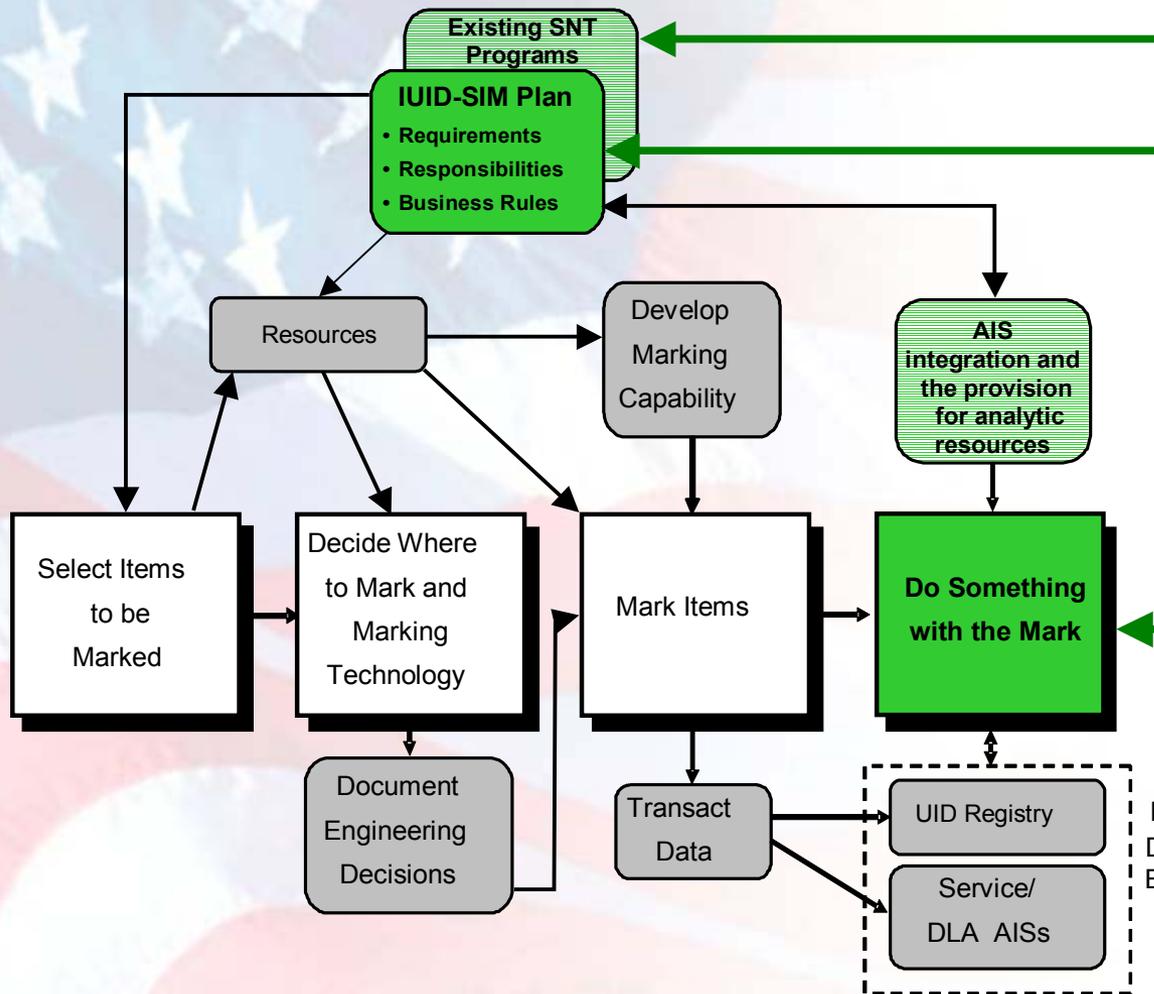
4151.19 links the DoD effort to mark parts with IUID to the need to transform sustainment support to a TLCSM approach:

4.1. Develop broad-based **SIM programs that make data about specific items and their respective total populations readily available to maintainers, logisticians, and other functional area managers.**

4.2. Develop effective **SIM programs providing accurate and timely item-related data that is easy to create, capture, and use.**

Revised Implementation Pathway

DO SOMETHING WITH THE DATA!



SIM: Managing Unique Attributes

- SIM is ability to characterize uniquely identified items by their specific and unique attributes for the purposes of improving/optimizing materiel readiness.
- Attributes can be any quantifiable measure of performance, time, space, composition, environment, pedigree, cost, or any other definable data such as historical, contractual, and ownership information associations.

Design

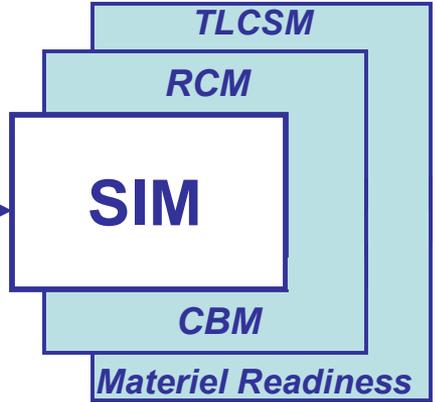
Manufacturing

Procurement

Maintenance

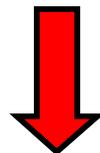
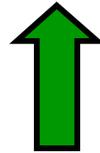
Logistics

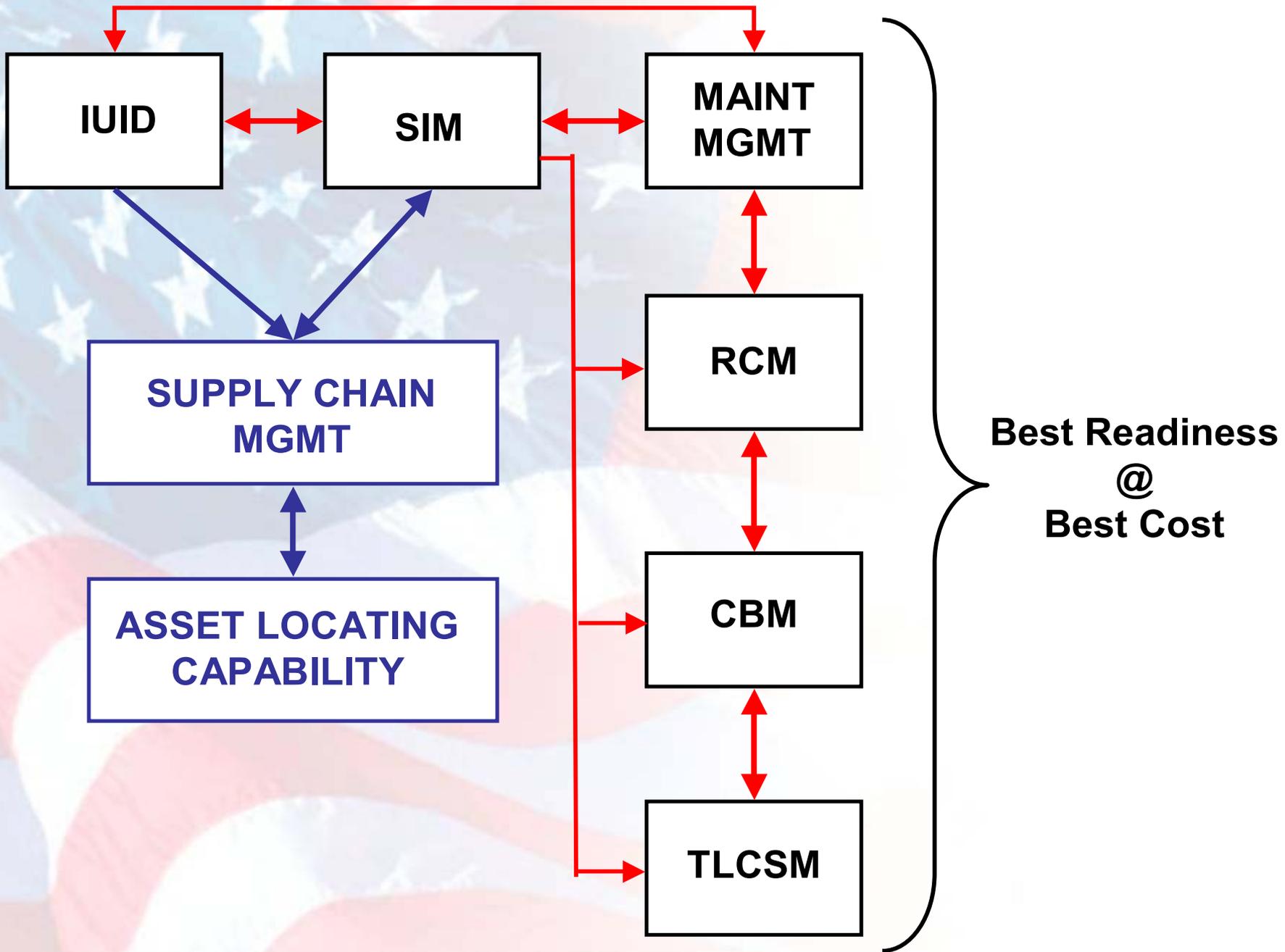
ATTRIBUTES



**Readiness,
Reliability,
Safety**

**Ownership
Cost**





The Need to Transform from SNT

- **Current Service SNT programs have recognized the need to increase the number of components to be tracked and the criticality of AIS transformation.**
 - **USAF: SNT BCA - Feb 04**
 - **USN: SNT Program Analysis Feb 2003**

Challenges

- **CH-47 transition from current practices to UID enabled SIM**
 - **2410 currently supports approximately 280 items**
 - **TLC SM analysis identified approximately 1100 UID items to be tracked**
 - **Current management system cannot support this four fold increase in component visibility**
- **SNT programs are based on paper paradigms.**
 - **Need to exploit technology implementations**
 - **Need to become the driver of integrated enterprise materiel readiness and availability processes.**

SIM Implementation

6.2. Military Departments and Defense Agencies will identify populations of select uniquely identified items to track and manage within their maintenance SIM programs. Selection of these populations shall be based on the magnitude of potential benefits to DoD maintenance operations.

SIM programs will be designed and operated to optimize end item availability while minimizing support costs by:

- Providing **rapid access to comprehensive and accurate information.**
- **Eliminating** manually-supported **paperwork**, reducing job times, enhancing **maintenance** task and personnel **scheduling**, and **optimize repair inventory.**
- **Reducing maintenance requirements** through better configuration management and item/select population life-cycle history information.
- Facilitating tracking of specific item performance to **support reliability analysis, warranty claims, and repair performance evaluation.**

Machine Readable Code (MRC)



Item Unique Identification (IUID)



Strategic Asset Visibility & Accountability



Serialized item Management (SIM)



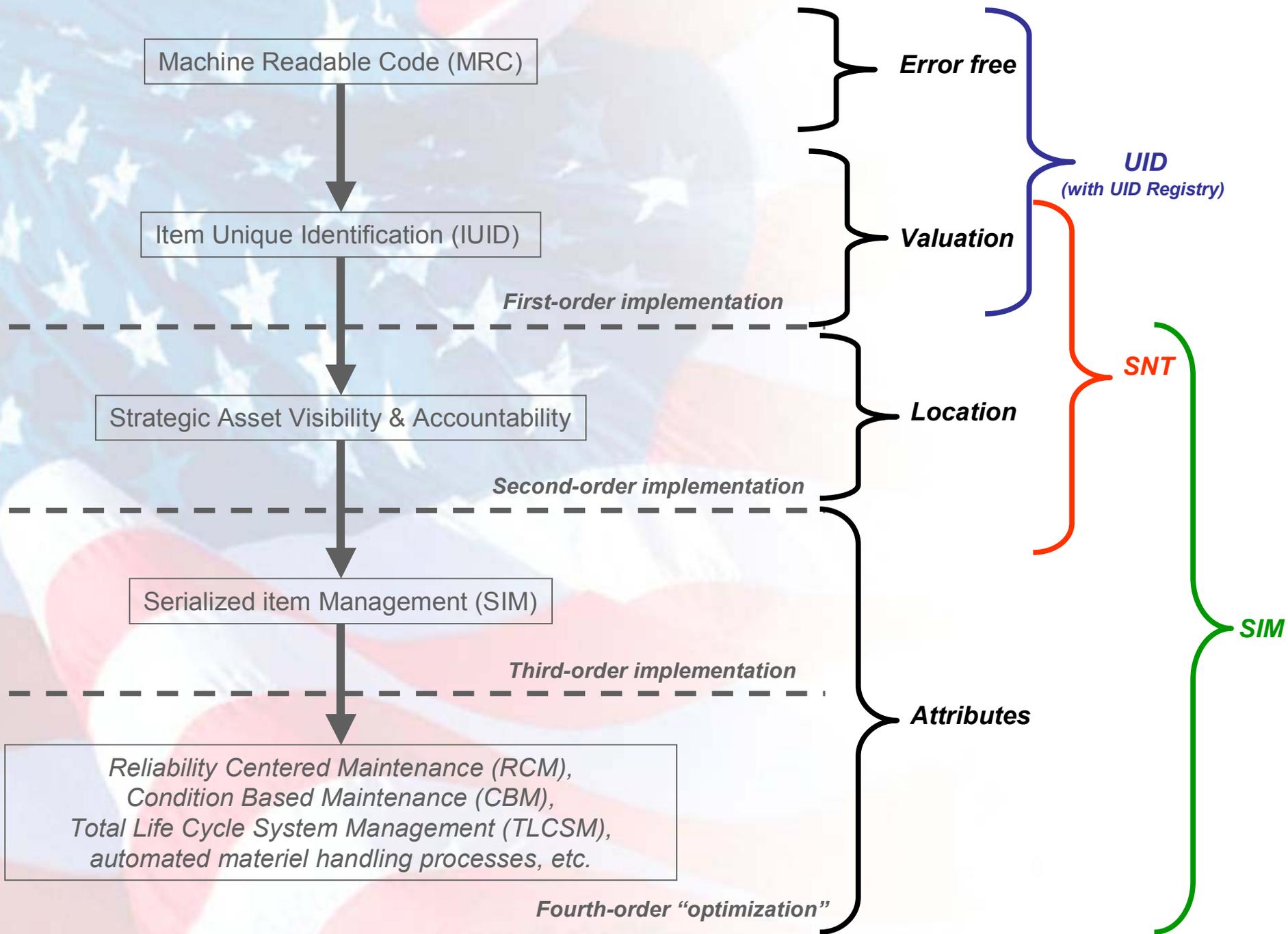
*Reliability Centered Maintenance (RCM),
Condition Based Maintenance (CBM),
Total Life Cycle System Management (TLCSM),
automated materiel handling processes, etc.*

First-order implementation

Second-order implementation

Third-order implementation

Fourth-order "optimization"



Results of IUID-enabled SIM

- DoD weapon system sustainment managers will have **dramatically improved insight into the cause-and-effect relationship between resources and readiness.**
- Capitalizing on this insight, weapon system support **decisions will both be more informed and take less time.**
- **Data-driven continuous process improvement (CPI)** initiatives will be institutionalized, enabling the effective management of materiel reliability, materiel repair/replacement cycle time, and materiel sustainment cost **performance-to-plan.**
- Overall **material readiness will be higher**, and overall weapon system **life-cycle cost will be lower.**
- Fully automated maintenance management (**unburdens the maintainer, increases productivity**)

How can IUID work in “End-to-End” processes?



- ✓ Describes the operational functions and processes of an “end-state” vision for a fully IUID-enabled automated maintenance environment from a users perspective
- ✓ Provides an implementation bridge for the advancement of new information processes between depot, field-level, weapon system, engineering, and item management systems for improved materiel readiness
- ✓ Provides guidance for effective implementation planning

IID Implementation Planning Template for DoD Maintenance Depots

Item-Unique Identification Implementation Planning Template for DoD Maintenance Depots



November 2006

Prepared by the Office of the Secretary of Defense
Material Readiness and Maintenance Policy

Depot FOC is defined by achieving the *outcomes* of a 3 phase approach that establishes:

- 1. Depot IID processes and associated doctrine.**
- 2. Capability to uniquely identify and mark items using DoD sanctioned serialization schemas and parts marking techniques (plates, labels, DPM)**
- 3. Capability to automatically capture, modify, and query IID data in a local database and to transmit that data to a DoD centralized registry.**

Describes organized steps to plan and successfully execute implementation to achieve outcomes

New Emphasis for Depots

Rapidly transform the depots to support a legacy UID solution for their customers:

- *The depots will mark approximately 80% of legacy items***
- *Detailing specific solutions to the mark is not required***
- *Support and implement general data-plate TO, TB, & LES approach that facilitates majority of marking applications***

The “Take-aways”

- Maintenance must transform to facilitate TLCSM
- IUID-enabled SIM is required by DoDD & DoDI
- IUID is inextricably linked to SIM; SIM is inextricably linked to TLCSM
- SIM is built from SNT but it is much more; it is *enterprise-wide* management of uniquely identified items by all relevant attributes needed for TLCSM of those items
- Integration with AISs is critical

The “Take-aways”

- Service SIM Plans are required
- SIM implementation is dependent upon IUID and an effective strategic (i.e., across the enterprise) asset tracking & locating capability
- Depots are key implementers and are needed to help orchestrate the adoption of default rules to quickly mark majority populations of parts

**Even if you're on the right track, you'll
get run over if you just sit there.**

Will Rogers

Online Resources

- UID Website
 - <http://www.acq.osd.mil/dpap/uid>
- IUID Toolkit
 - <http://www.iuidtoolkit.com>
 - Four tracks: PMs, Suppliers, Depot, Warfighter
- DAU UID Special Interest Area
 - Within Acquisition Community Connection
https://acc.dau.mil/simplify/ev.php?ID=18058_201&ID2=DO_TOPIC
- MR&MP (Maintenance IUID CONOPS & Depot Implementation Guide/Template)
 - http://www.acq.osd.mil/log/mrmp/UID_maintenance.htm

The background of the slide is a stylized, semi-transparent American flag. The stars and stripes are visible but faded, creating a patriotic backdrop. The text "Questions?" is centered in a dark blue, sans-serif font.

Questions?

SIM Implementation

The Heads of Defense Agencies and Secretaries of the Military Departments shall:

- **5.3.1 Establish SIM programs**, where possible, to include identifying appropriate item populations and generally developing the other capabilities necessary to support SIM concepts
- **5.3.2. Ensure operational and support activities comply with SIM requirements; designate a focal point for SIM efforts** within the DoD Component
- **5.3.5. Maintain an overview of SIM** systems, plans, programs, and performance, providing **periodic updates of SIM program status and performance**, when requested
- **5.3.7. Ensure that current and future AISs effectively support SIM** program requirements, and support SIM program coordination and technology evaluation
- **5.3.8. Manage the maintenance and support of the serialized items using the information generated about each unique item, i.e. its pedigree data.**

Begin via existing SNT systems

Current serial numbered tracked item quantities (~)

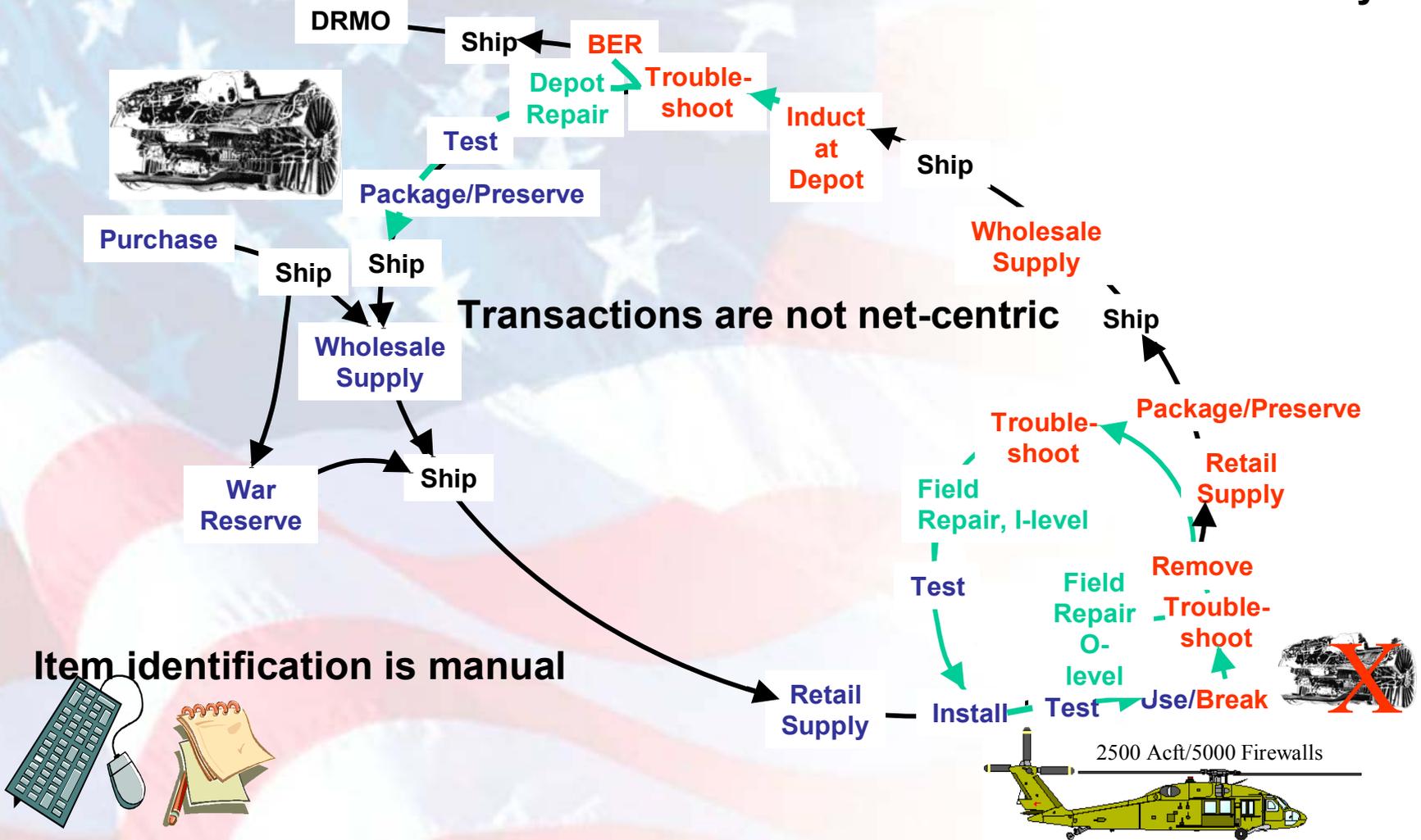
- > 3.8 million items for Army aviation
 - > 7 million NAVAIR
 - 1.2 million DDG-51 class (potential end state 21.7 million)
 - 12.2 million items for USAF
 - > 144K Strategic weapon systems (submarine based)
-

24.3 million

UIT (small arms, sensitive items) not included

Property Transfer Dynamics

Items have to be identified at every step



Transactions are not net-centric

Item identification is manual

“Prime Movers”

Requirements:

- JROC approved sustainment KPP for “Availability”
 - 2 KSAs – Life Cycle Cost, Reliability
- CJCSI 3170.01F, *Joint Capabilities Integration and Development System (JCIDS)*
- CJCSM 3170.01C, *Operation of the JCIDS*

Integrated Policies:

- DoDI 5000.2 - Life Cycle Acquisition/Support
- DoDI 4151.19 - Serialized Item Management
- DoDI 8320.3 - Unique Identification (UID) Standards for a Net-Centric Department of Defense
- DAG/Supportability Guide

Governance/Oversight:

- DAB, DAES, MRSSG/MRU, GAO, BTA-IRB

Revised Implementation Pathway

DO SOMETHING WITH THE DATA!

