

Automated Configuration Management System (ACMS)

Lockheed Martin
Configuration and Data Management
Corporate Council

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Briefing Outline

- Background
 - Current Army Environment and Problems
- ACMS
 - Task
 - Methodology
 - Summary
- AMC Implementation Strategy

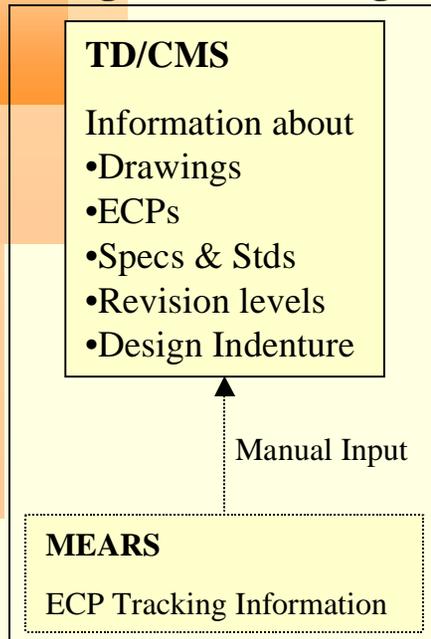
What is Configuration Management (CM)

“A management process for establishing and maintaining consistency of a product’s performance, functional, and physical attributes with its requirements, design and operational information throughout its life. ...”

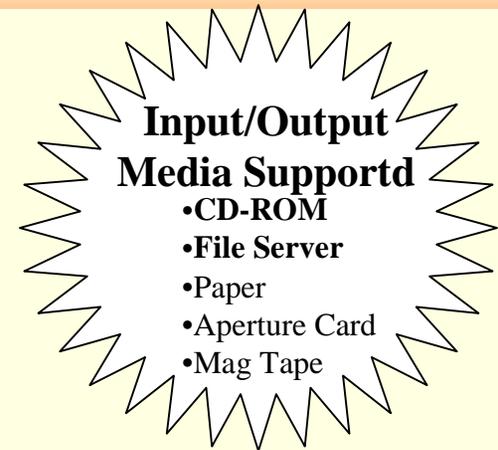
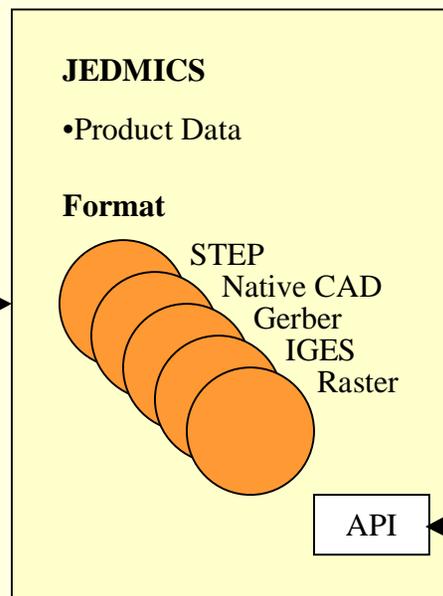
(MIL STD 2549)

Current EDM Systems

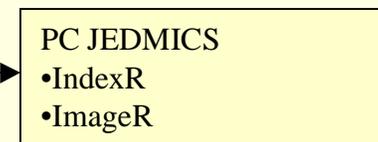
Configuration Management



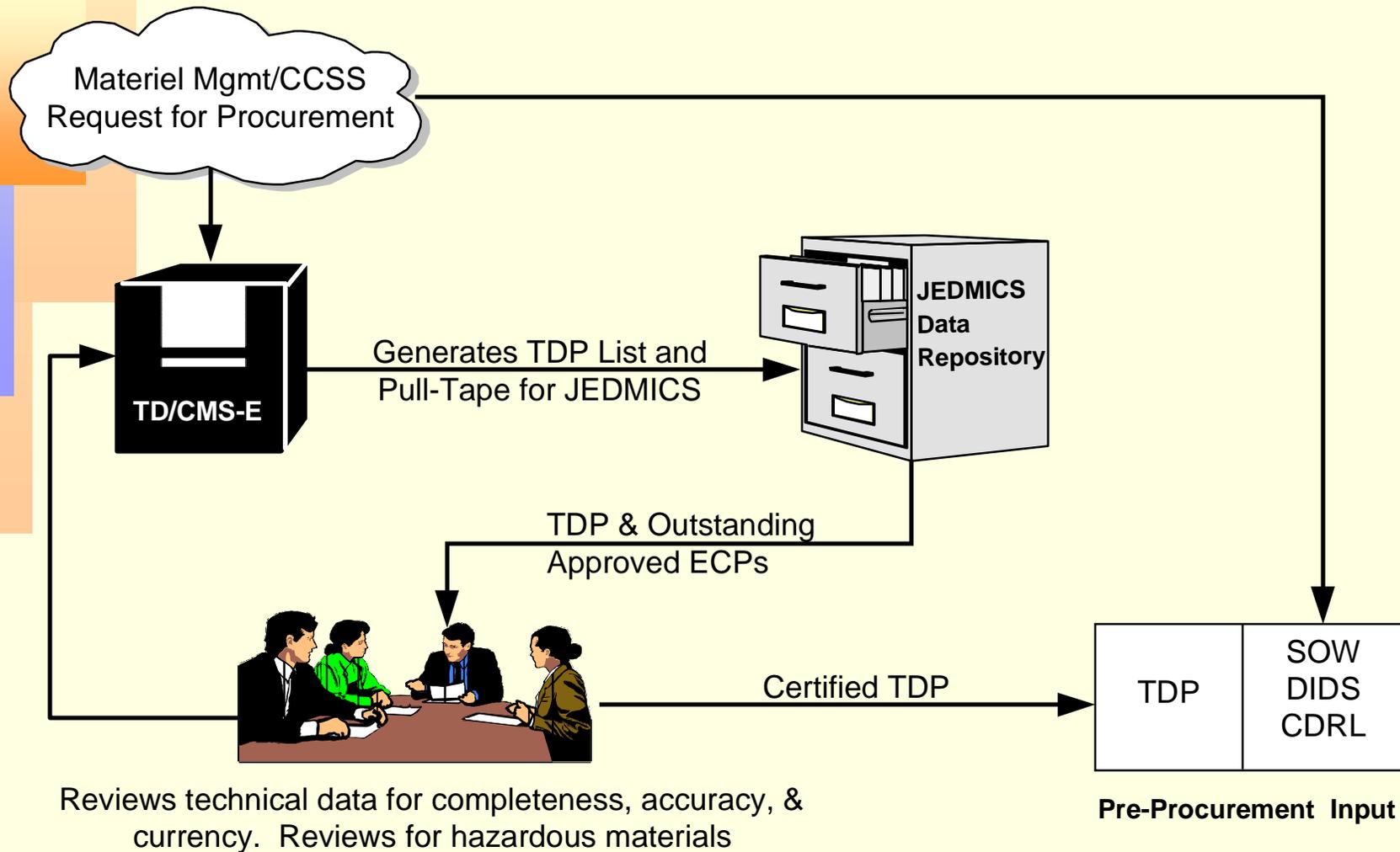
Repository



Direct User Access Tools



Tech Loop Process



Current Engineering Data Statistics

AMC has:

- 6 Technical Data/Configuration Management System (TD/CMS) and 5 Joint Engineering Data Management Information Control System (JEDMICS) sites
- 8.5 Million images
- 5,000 Engineering Change Proposals (ECPs) / yr
- 8,500 spare parts reprocurments / yr

Current Army Environment

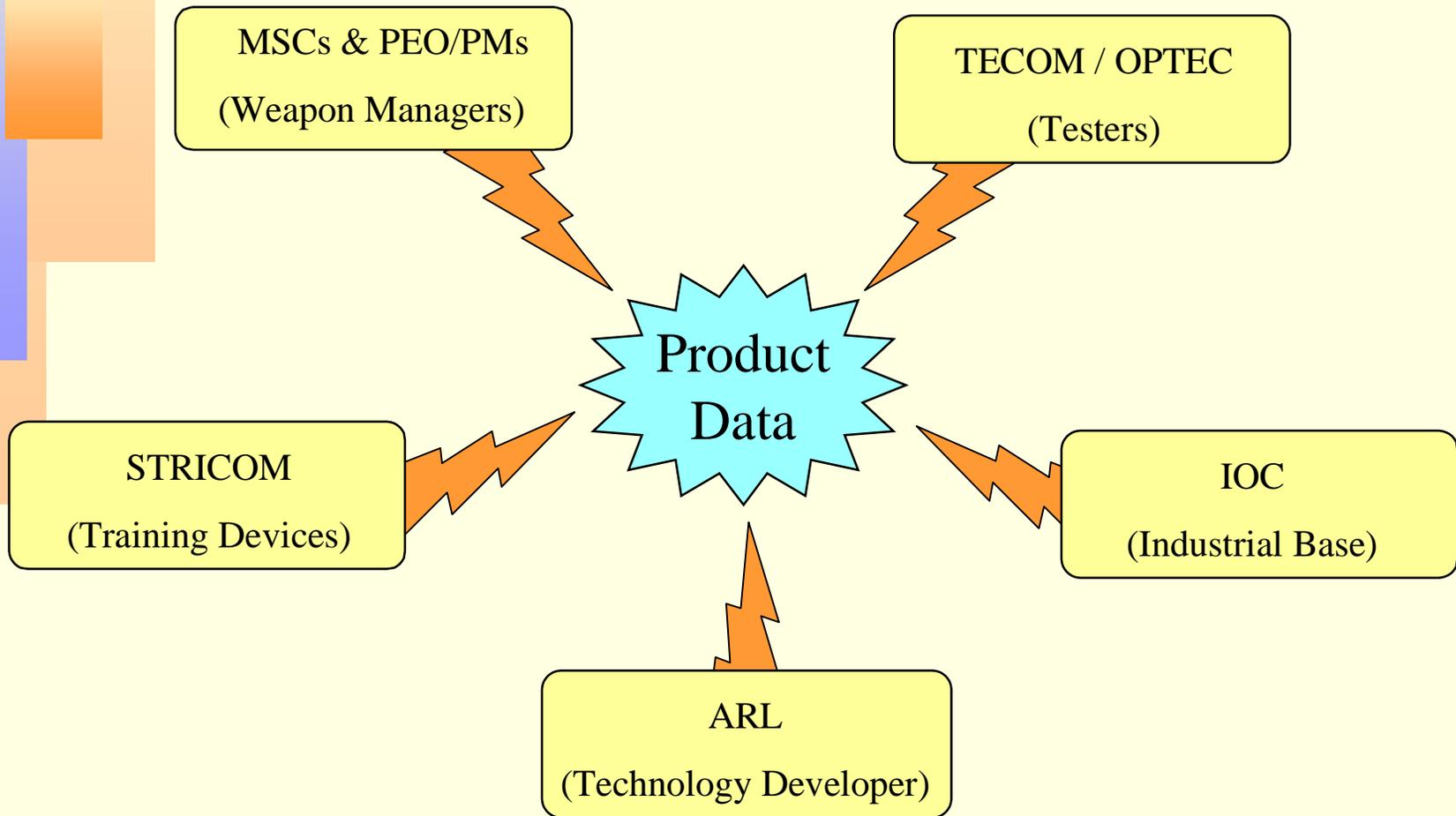
Facts

- Army legacy digital product data is primarily stored in "unintelligent" raster format
- Contractors are developing "intelligent" data that cannot be managed by TD/CMS
- TD/CMS can't manage multiple product baselines
- CITIS implementations tend to be program unique (digital delivery of product data)

Resulting Problems

- Forces new producers to "re-invent" lost data intelligence - geometry and metadata
- Army incurs additional cost for conversion of data to raster format
- Depots must rely on other unofficial data sources to support repair and modifications
- Repetitive unique solutions are expensive and provide little interoperability

Army Interoperability Needs



Analysis

- Army does not do all aspects of CM as well as it should. Current automated system (TD/CMS) can't handle all user needs.
- Army must switch from a “drawing” to “product” perspective.
- Army must provide access to all product data required (not just the two dimensional images of record) to support a product throughout its life cycle.
- Complete life cycle access to product data is only possible if the Army practices cradle to grave configuration management of product data.

Solution

Need an automated configuration management system that:

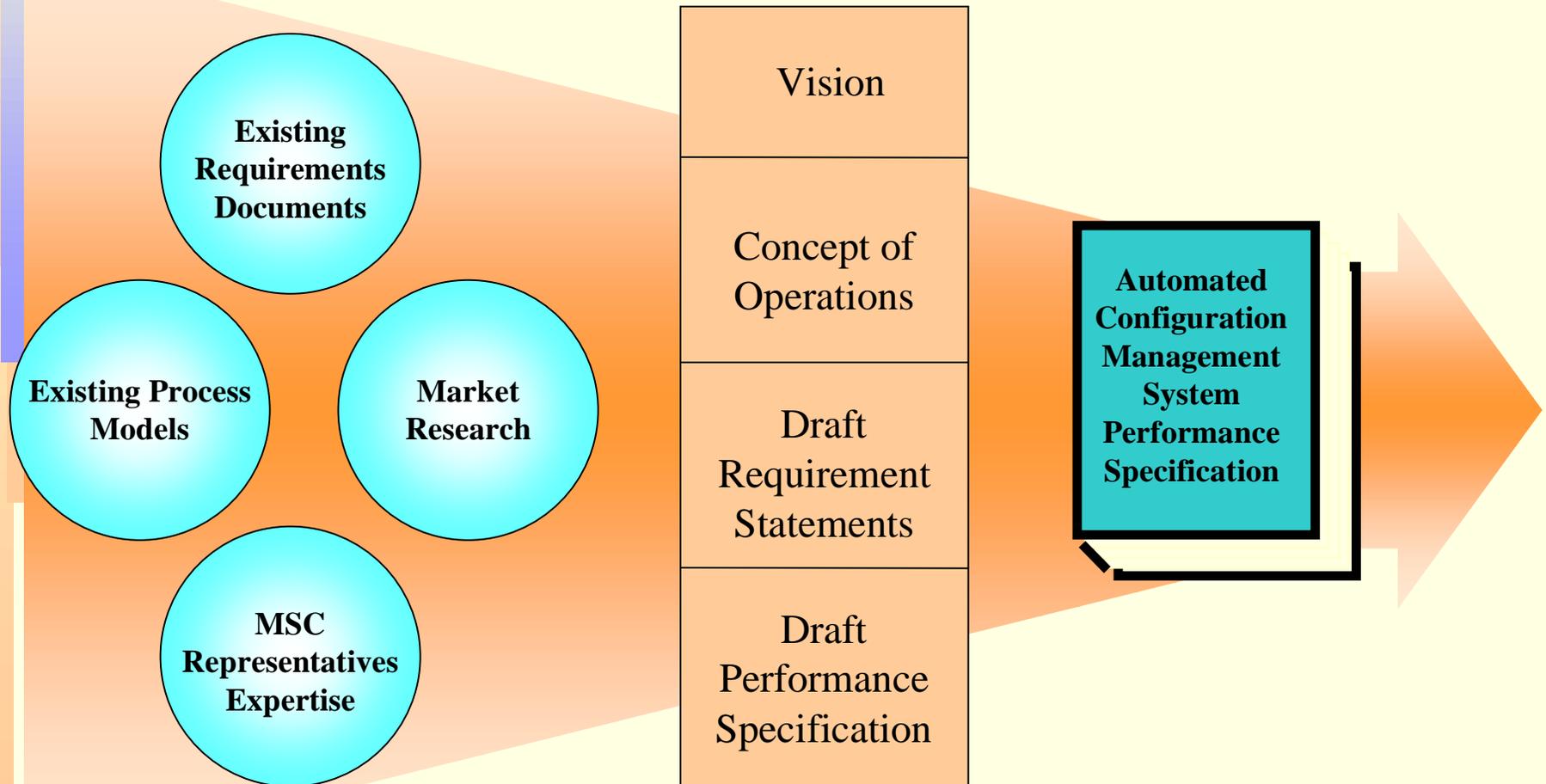
- Knows about all product related data
- Can accept and manipulate “intelligent” data and manage multiple product baselines
- Is compatible with Industry practices
- Provides a standard means for the delivery of digital product data
- Supports Acquisition Reform objectives
- Allows for interoperability between sites
- Uses Commercial-off-the-Shelf technology

That's ACMS!

Task

Army Materiel Command (AMC) tasked the Engineering Data Management Systems (EDMS) Functional Coordinating Group (FCG) to prepare a Performance Specification for an Army standard automated configuration management system that would meet the Army's current and future needs.

Methodology



PDM Functionality

- Product Structure/Bill of Materials
- Configuration Management
- Work/Process Flow Management
- Vaulting
- Program Management
- Imaging Services
- Parts Classification

Note: PDM systems tend to be highly customizable because of the vary nature of the product and the environment in which they operate. Few PDM systems provide the full range of functionality given above. All systems perform some functions better than others.

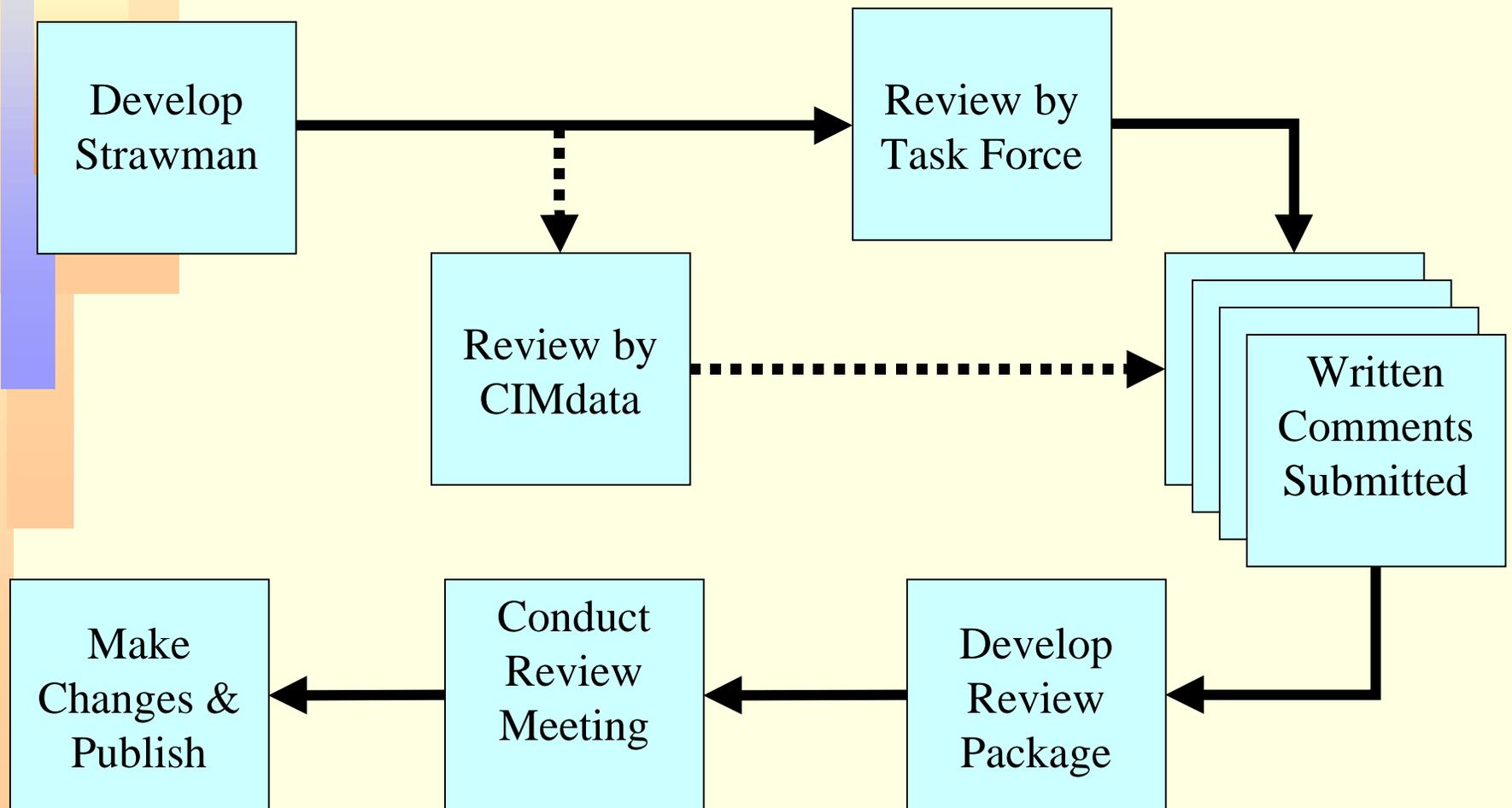
PDM Benefits

Typical PDM benefits reported by Commercial Sector

- Reduction in number of Engineering Changes 55-80%
- Reduction in Engineering Change processing time 35%
- Reduction in design/development costs 50%
- Reduction in design cycle time 20-40%
- Reduction in the number of parts 42%
- Reduction in the number of paper copies 40-90%
- Reduction in the number of document control staff 30%
- Reduction in document release time 60%
- Reduction in document request time 99%
- Reduction in manufacturing costs 30%



Review Process



CIMdata Input

- Verified that our vision is consistent with the direction the PDM vendor community is moving
- Cautioned us that if we were truly serious about reaching our vision, we must limit the amount of tailoring of the specification that would be allowed
- Helped us identify the requirements that are not attainable with today's PDM systems
- Stated that, in the near term, the best chance of achieving the level of interoperability envisioned is to use same product at all sites



ACMS Vision

ACMS will:

- Provide the **required data** when it is needed and in a form that the user can apply to accomplish the mission.
- Operate in a diverse Army environment, integrate with other MSC business processes, and communicate with other MSC, government and industry information management systems.

Required Data

Required data is all product data, consisting of documents and metadata, required to specify, design, analyze, manufacture, maintain, sustain, test, inspect and dispose of the product over its entire life cycle.

Documents

- Drawings
- Reports
- Databases
- Application software
- Engineering designs
- etc.

Metadata

(data about the documents)

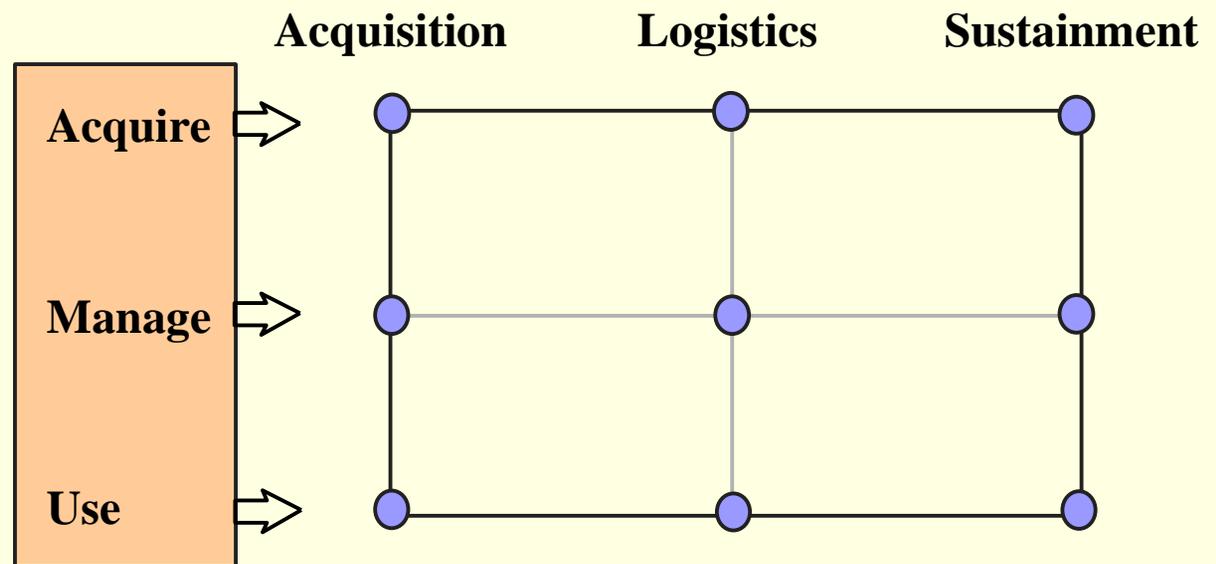
- Identifier
- Document location
- Revision level
- Owner
- Author
- Relationship to products
- Relationship to other documents
- etc.



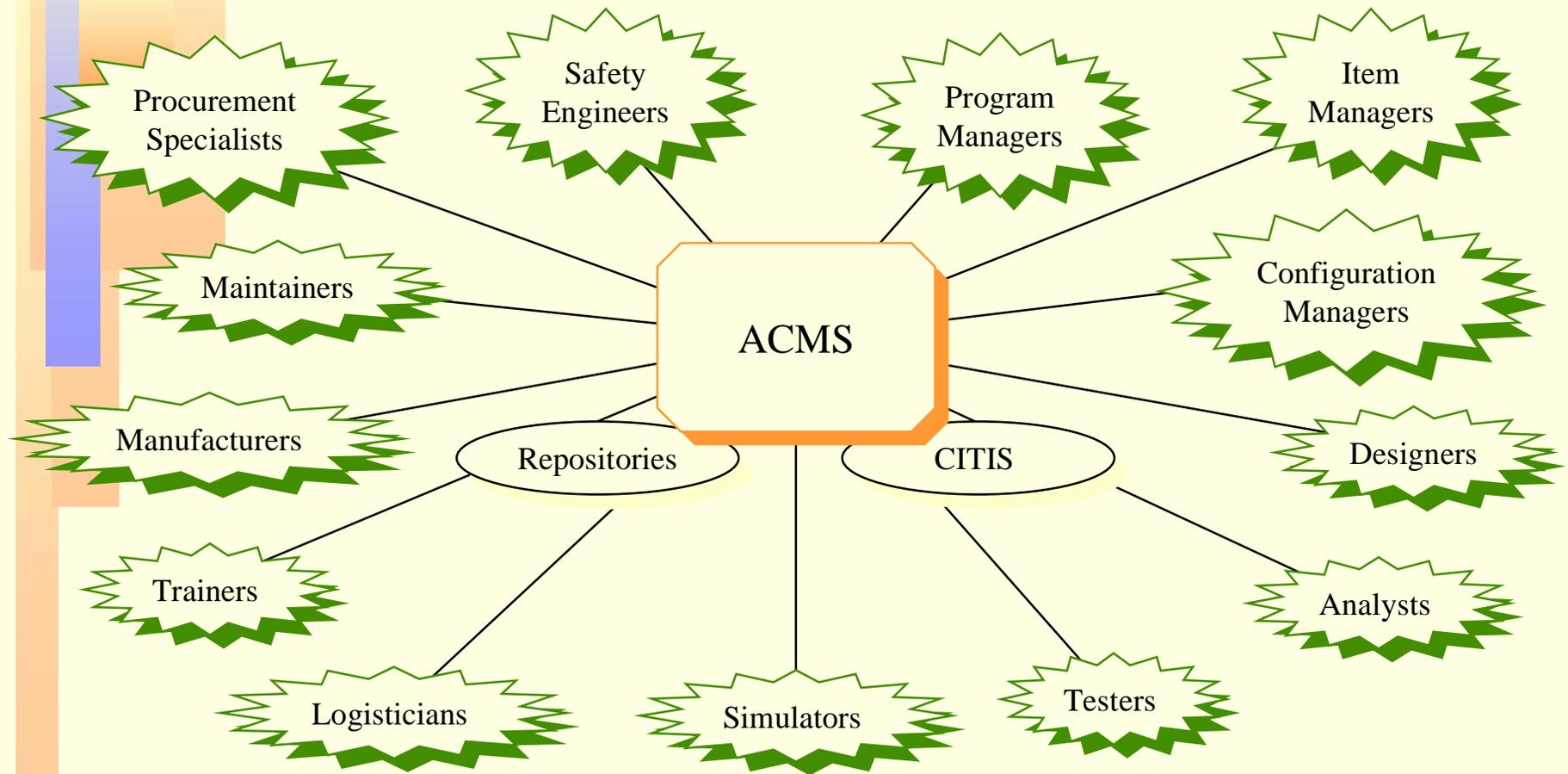
Concept of Operations Addressed

Weapon System Life Cycle

**Engineering &
Technical Data
Life Cycle**



ACMS User Communities



ACMS Operational Requirements

Product Data Management

- Product Data Control
- Workflow Management
- Product Structure Management
- Program Management
- Imaging Services
- Data Translation
- System Administration

Configuration Management

- CM Data exchange
- Configuration Planning
- Configuration Identification
- Configuration Audit
- Configuration Control
- Status Accounting

Tech Loop

- Tech Loop Creation and Maintenance
- Support Tech Loop Reviews
- Generate Tech Loop Reports



Configuration Control

3.1.2.5 Configuration control requirements

3.1.2.5.3 Record and review engineering change actions.
ACMS shall provide the capability to create, assign, record, retrieve, and display the metadata and unique identifiers of engineering change actions, and retrieve and display variances to the configuration documentation and hardware or software. Examples of engineering change action metadata include originators, disposition and date of disposition.



Status Accounting

3.1.2.6 Status accounting requirements

3.1.2.6.1 Record field configuration. ACMS shall provide the capability to record, retrieve, and display "as built" and "as modified" configurations resulting from the installation and removal of assemblies, components, parts, and material whether serialized or tracked by lot or batch.



Tech Loop Creation and Maintenance

3.1.3.1 Tech Loop creation and maintenance

3.1.3.1.1 Record Tech Loop activity. ACMS shall provide the capability to record information about Tech Loop activities including technical reviewers and electronic authorizations, responsible activity, milestones, action items, and related dates, allowing for multiple parallel processing.

3.1.3.1.4 Establish relationships. ACMS shall provide the capability to establish relationships and identify metadata about those relationships between Tech Loop actions and the results of the Tech Loop evaluation.

3.1.3.1.5 Attach documents to actions. ACMS shall provide the ability to attach documents to Tech Loop actions.

3.1.3.1.6 Identify and link similar procurement actions. ACMS shall have the ability to identify and automatically link current procurement requests that have the same part number and Government Furnished Equipment/Government Furnished Material (GFE/GFM) suppressions.

3.1.3.1.7 Bundle procurement requests. ACMS shall have the ability to search, group and process as a single procurement action, procurement requests, based on user defined attributes.



Key Elements of ACMS Performance Specification

- Section 3 Requirements
 - Operational
 - Product Data Management
 - Configuration Management
 - Tech Loop
 - Interface
 - External
 - Internal (none)
 - User
 - Ownership and support
 - Operational Environment
 - Client workstation
 - Network
 - Server

Key Elements of ACMS Performance Specification

- Section 6 Notes

- Identifies requirements that can't be met by COTS today
- Identifies requirements that are
 - enterprise wide
 - enterprise wide but require tailoring for meeting site specific environments
 - command unique

Long-term ACMS Requirements

Paragraph Number	Requirement Title
3.1.1.1.3.5	Navigate non-host site product structures
3.1.1.1.3.6	Search non-host site product structures
3.1.1.1.3.7	Provide non-host site product data retrieval
3.1.1.5.1	Add translators
3.1.1.5.3	Provide automatic translation services
3.1.1.5.4	Provide default translation parameters
3.1.1.5.5	Translate product data
3.1.1.7.2.2	Manage multiple PDM systems
3.1.2.1.1	Process data information packets
3.2.1.1	Process data information packets
3.2.1.16	Interface with JCALS Workflow Manager



Requirements Tailoring Restrictions

Section 3 ACMS Requirements	Requirement Title	Enterprise- wide Requirements	Enterprise- unique Requirements	Command- unique Requirements
3.2.1.1	Process data information packets (see 3.1.2.1.1)	X		
3.2.1.2	Send e-mail	X		
3.2.1.3	Provide generic API	X		
3.2.1.4	Launch applications		X	
3.2.1.5	Interface with MEARS			X
3.2.1.6	Interface with ECALS			X
3.2.1.7	Interface with CARS			X
3.2.1.8	Interface with CCSS 404			X



Key Elements of ACMS Performance Specification

- Appendices

- A - ACMS Concept Overview
- B - ACMS Support of Army Product and Data Life Cycles
- C - ACMS Support for Select Business Processes
- D - Glossary
- E - Acronyms



Summary

- The lack of good data management capabilities is costing the Army a lot of money.
- Good Configuration Management is the key to data access and currency
- An ACMS will help the Army gain control over its product data and will provide the Army a tool by which it can continually improve its business processes
- Private industry experience shows significant cost savings can result

AMC Implementation Strategy

- Publish the ACMS Performance Specification
- Continue to build customer and stakeholder support
- Quantify economic impacts
- Pursue a two phase acquisition strategy
 - Perform market analysis and develop implementation recommendations
 - Procure and install hardware and software and train personnel
- Seek funds to support the above

ACMS Performance Specification

- Published as an Army specification with limited coordination
 - AMCOM is the preparing activity
 - AMSAA is the agent
- Forward to DoD for their consideration to publish as a DOD specification
- Issue an AMC policy statement that would require any new configuration management, data management or PDM related acquisition to comply with the specification



Market Analysis

- Use a contractor to perform analysis
 - System integrator not a PDM vendor
 - Conduct site surveys
 - Evaluate the necessity of using multiple instances of a single PDM product
 - Recommend products and deployment strategies and plans
 - Provide testbed for Army evaluation of contractor recommendations
- AMC to charter an IPT
 - Members from the EDMS FCG, Chaired by EDMS PMO
 - Prepare scope of work
 - Conduct IPRs
 - Perform Army evaluation of contractor recommendations
 - Recommend Army Implementation plans to HQ AMC



Visit the ACMS Web page

For additional information
and a copy of the
Performance Specification,
MIL-PRF-32029(MI)

[www-iea.ria.army.mil/ai/eng_data/
acms/acms_frameset1.html](http://www-iea.ria.army.mil/ai/eng_data/acms/acms_frameset1.html)

NOT
MEASUREMENT
SENSITIVE

MIL-PRF-32029(MI)
30 June 1998

PERFORMANCE SPECIFICATION
Automated Configuration Management System (ACMS)

This specification is approved for use by the Department of the Army and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers performance requirements for the U.S. Army's Automated Configuration Management System (ACMS). It defines the functional requirements for ACMS, interface characteristics, and the environment in which it must operate.

1.2 ACMS overview

1.2.1 ACMS purpose. The ACMS will provide the Army with a next-generation configuration management and product data management system. It will enable greater access to and sharing of enterprise product data¹ in support of Integrated Product Teams (IPTs); engineering change action processing; and reprourement, operations, maintenance, and disposal activities. The primary enhancements ACMS will provide include the following:

- a. Storage and use. ACMS will extend the data types stored and managed, for example engineering models, simulations, and other forms of intelligent product data.
- b. Rapid retrieval. ACMS will enhance the user's ability to rapidly find, retrieve, and control access to product data.

¹ This performance specification uses the term "product data" to refer to all documents and metadata related to a product's requirements, design, implementation, and support. The term "document" has the same meaning as that used in MIL-STD-2549: A self-contained body of information or data which can be packaged for delivery on a single medium. Examples of documents include drawings, reports, standards, databases, application software, and engineering designs. "Metadata" are elements of information that describe data, such as document identifier, date, owner, release level, format, keywords, data location, approval authorizations, part identifier, and part name.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-RD-SE-TD-ST, Redstone Arsenal, AL 35898-5000, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

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