NAVAIR Enterprise IPT Efforts

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NAVAIR Business Fiscal Year 2012

TACTICAL AIRCRAFT

AIR ASW, ASSAULT & SPECIAL MISSION

TEST & EVALUATION RANGES

Overview

~$37.4 billion/year

~35,000 People (Civ/Mil/Ktr)

~8 Primary Sites

~90 ACAT Programs

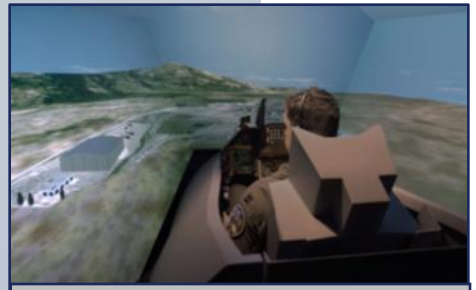
~200 New Aircraft Deliveries

~550 Aircraft Repairs

~3,900 Aircraft Supported

~100 Type/Model/Series

UNMANNED AIRCRAFT & STRIKE WEAPONS



COMMON SYSTEMS/MISSION SYSTEMS/TRAINING/ALRE

FLEET READINESS CENTER INDUSTRIAL FACILITIES

Implementing Long Range Strategy

PRIORITIES

PEOPLE

INVEST IN OUR PEOPLE

SPEED

INTEGRATED WARFIGHTING CAPABILITY

DELIVER INTEGRATED & INTEROPERABLE WARFIGHTING CAPABILITIES

AFFORDABILITY

IMPROVE AFFORDABILITY ACROSS THE FULL LIFE CYCLE

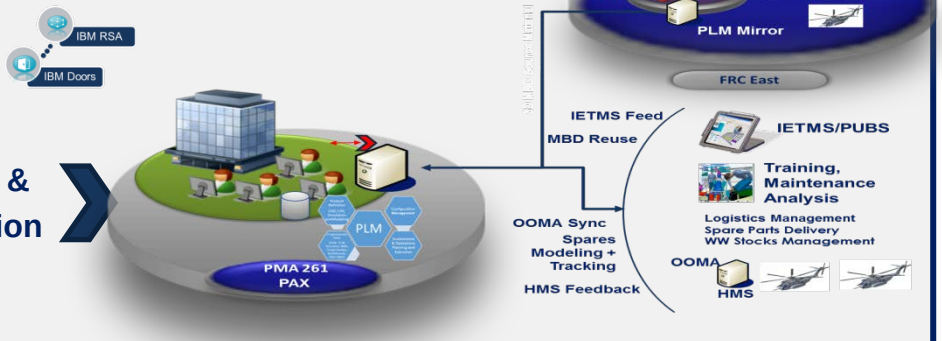
STRATEGIES

- Technical & Professional Skills
- Teamwork & Collaboration
- Quality of Work Life
- Innovation, Creativity & Risk Taking
- Capabilities-based Acquisition
- Government as Lead Systems Integrator (LSI)
- Rapid Response, Prototyping
- Operations & Support
- Weapons Systems Development & Procurement
- Organizational Productivity

Execution

- *Engineering*
- *Platform/ AV integration*
- *Quality*
- *Procurement (Supply-Chain)*
- *Production Engineering*
- *Program Managers*
- *Systems Engineer*
- *Open systems architect*
- *Others, IP and Data Management*

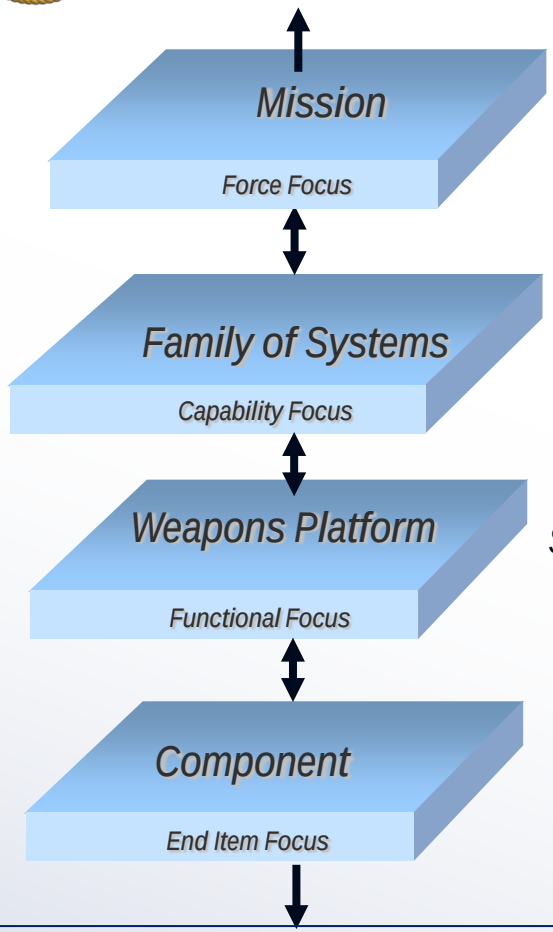
Immersion & Collaboration



Model Based Engineering and PM

ACHIEVING INTEGRATED WARFIGHTING CAPABILITY

Technical Data Tools Hierarchy

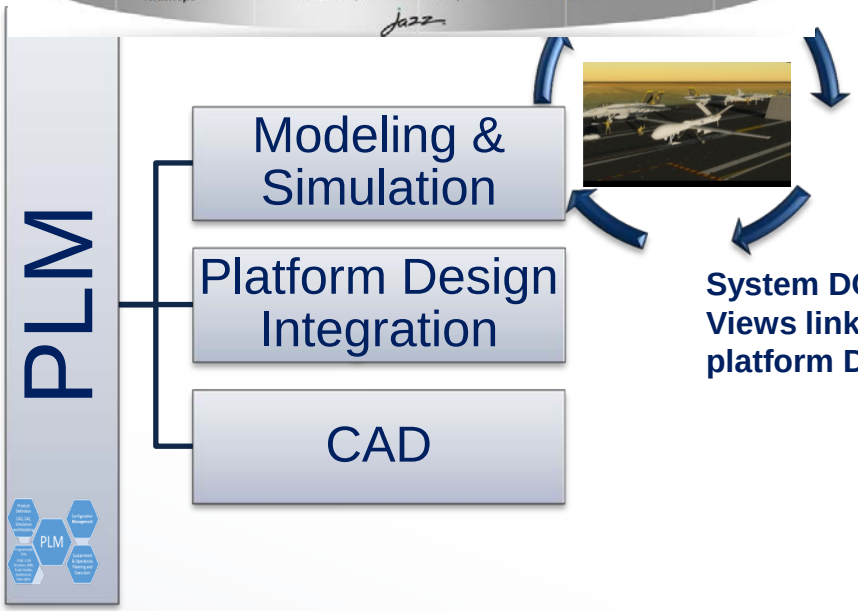


Translates Operational Concepts → Mission Capabilities

Translates Mission Capabilities → System Requirements

Translates System Requirements → Component Functions

Translates Component Functions → End Items



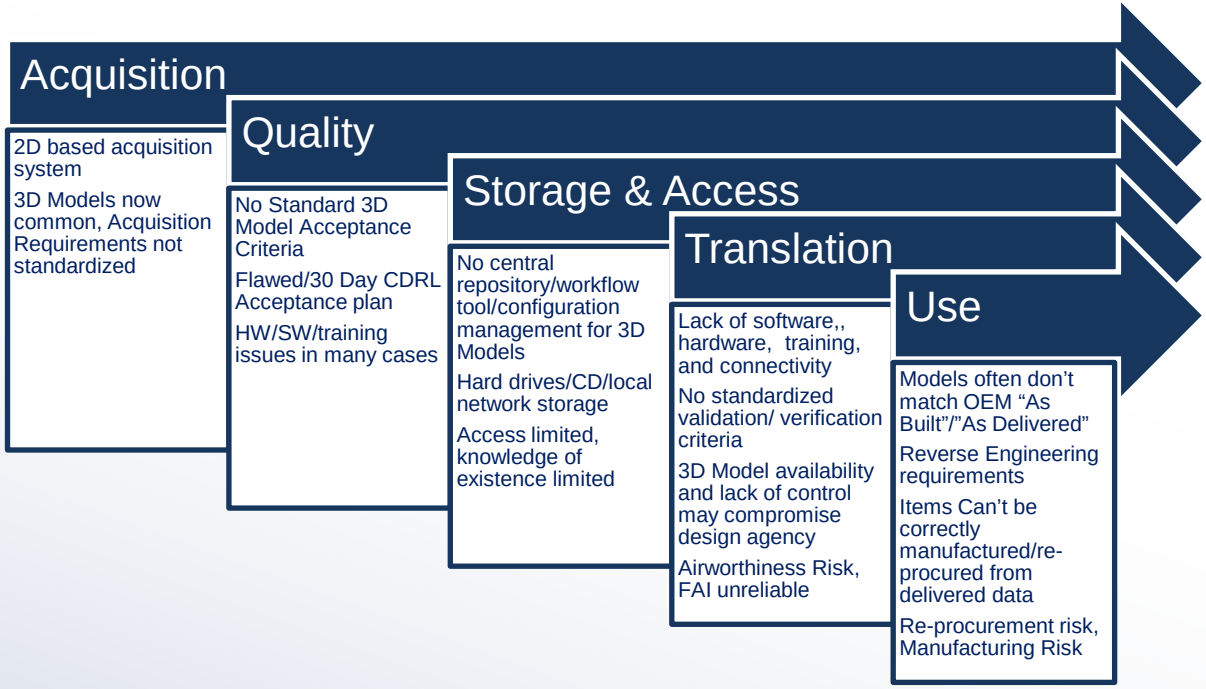
System DODAF Views linked to platform Design

IBM Jazz Platform Available for Architecture (DODAF) and Requirements support.

Product Lifecycle Management Suite Needed to integrate activities performed at platform level and to support SOS & FOS Modeling

TDP Lifecycle Management Issues and Risks

Lack of network connectivity across Enterprise to transfer data electronically



Outcomes

- Loss of TDP ROI
- Sole Source Lock
- Slow Response to Warfighter
- LSI Capability-Constrained
- Reduced Availability
- Significant Cost Growth

Poor TDP Acquisition Process + Limited data management tools/training/Funding = RISK

Software tool sets

	Engineering CAD Packages								PLM/Repository									CNC Software			
Site	CATIA	UGNX	Pro Eng	Solid Works	Auto CAD	Promise E	Solid Edge	CADRA	CM Pro	ESRS	Team Center	Windchill/ PDM Link	LEDS	TIERS	CITIS	JEDMICS	Enovia	GIBBS CAM	SURF CAM	Pro Eng	UGNX
FRCE	x	x	x		x		x			x						x		x			
FRCSW	x	x	x	x	x	x		x	x		x					x				x	
FRCSE		x	x	x	x		x		x		x					x			x		x
NAWCAD/LKE	x	x	x	x	x				x			x				x		x		x	
NAWCWD/CL	x		x	x	x							x	x								
NAWCTSD/ORL					x									x							
NATEC																x					
Boeing	x	x							x		x				x						
Lockheed	x		x	x		x		x	x		x	x									
NGC	x	x	x								x	x					x				
Bell	x	x	x								x	x					x				
Sikorsky	x	x	x								x	x					x				

There are multiple Gov't and OEM repositories for 2D and 3D data (one for one at OEMs for every program)

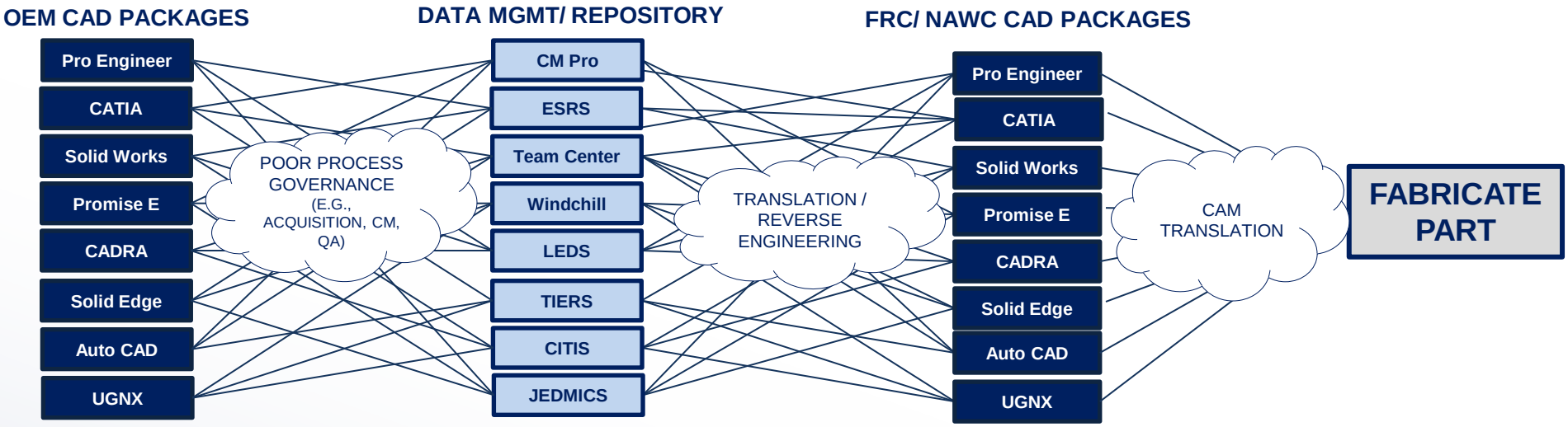
3D models (viewable and native CAD files) are stored predominately on local servers (sneaker-net) with little or no configuration management/status accounting data or connectivity. Not all systems are currently able to manage metadata requirements

Local PLM systems are being used but only in select departments within activities (there may be multiple systems managed in parallel) - there is no national linkage and no single authoritative data source

IAW SECNAVINST 5000.36, OPNAV N4 designated JEDMICS as the Navy **core authoritative source** FAM approved IT system for engineering drawing technical data utilized solely as a repository (no CM)

PROBLEM SUMMARY

"AS-IS" STATE



DISPARATE TOOL SETS & PROCESSES BEING USED ACROSS OEMs & GOVT SITES

ACQUISITION REQUIREMENTS NOT SYNERGIZED WITH LIFECYCLE SUSTAINMENT

DATA QUALITY PROBLEMS RECOGNIZED ONLY AT TIME OF USE

Goals

Quality: Establish 100% TDP configuration control. Improve TDP quality, usability & availability.

Cost: Reduce cost of reverse-engineering / translating / healing data and recreating parts due to incorrect TDPs.

CT: Reduce cycle time required to locate TDP and reverse-engineer TDPs.

Example of Business Impact

Costs associated with the TDP Challenges:

1. Scraping Parts Manufactured due to incorrect technical data
2. Reverse Engineering
3. Translation/Healing
4. Conversion from 2D to 3D and 3D to 2D

Example Program Macro TDP Issues

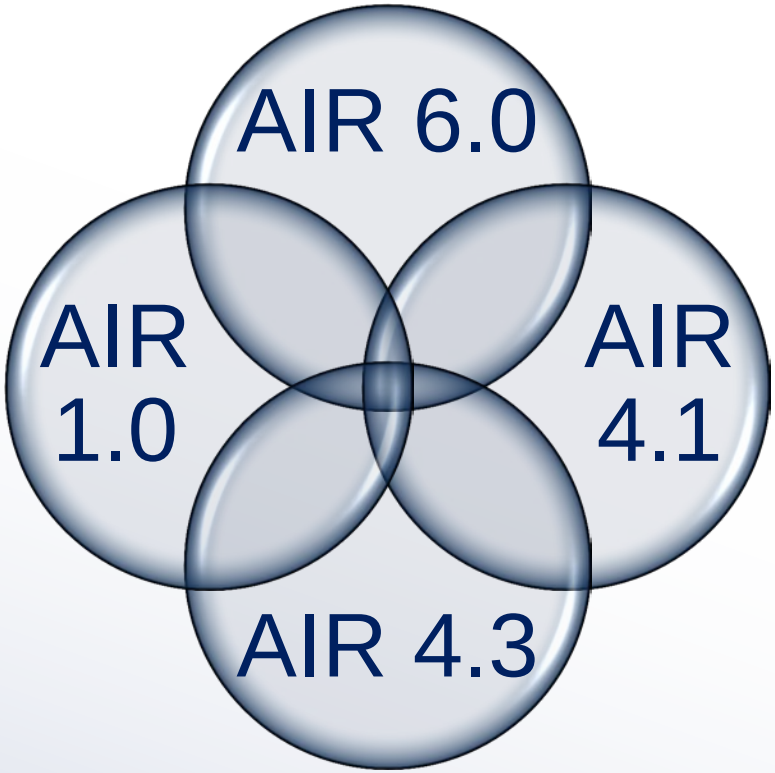
Data that is suppose to be available is not always easy to obtain and if it is not available or doesn't match the aircraft part, it must be reverse-engineered

Cycle time for medium complexity reverse engineering effort @ 2-6 months due to quantity of actions and availability of tools and engineers (Single Site impact)

Program A: 30% of OEM data is not in the correct configuration,

Program B: 97% of delivered data is unusable for manufacturing as delivered from the OEM (Variety of factors including internal factors to NAVAIR)

Current NAVAIR Stakeholders



6.0 Logistics
- 3D repository Gap
- Translation and verification process challenges

4.1 Systems Engineering
- Lead Systems Integrator-LSI
- Open Systems Architecture
- Flight Clearance and Flight Safety
- Overall Technical Management

4.3 Air Vehicle Engineering
- Perform Design Analysis
- Rapid Design Modifications & Trades
- 3D support for Fleet Bulletins

1.0 Program Management
- Supply Chain Management
- Enable contracting options
- Unified Business Management Environment

Common Goals:

Leverage TDP
Respond faster to capability needs
Increase opportunity for competition

TEAM/PROJECT RELATIONSHIPS

AIR-1.0, 4.0, 6.0

TDP Enterprise IPT

Policy
Instructions/Guidance
Business Rules
Process Integration

New Technology (AM)

NAVAIR/NAWC Connectivity

TDP CPI Project (CAD/CAM/CAE)

- Acquisition/Development (hardware and software policy)
- Acceptance/Review (IS3C)
- Repository (IS3C)/Library Mgmt./(IS3C)
- Translation (IS3C) and Healing (top-level requirement)
- Reverse Engineering
- Validate (IS3C)

Awareness

Industry

Awareness

LSI
Policy
Instructions
Business Rules

"Should Cost" Better Buying Power

CTMA Projects
(multiple)

Awareness

PMA-led 3D Efforts
(e.g., CH-53K, etc.)

Awareness

COMFRC Industrial Network Connectivity effort

Awareness

Other DoD Projects

Awareness

Data Rights Policy

53K PLM Project Summary

Problem Statement

The H53K is a Model Based Platform authored in CATIA V5 & maintained in Enovia V5. Current DOD and NAVAIR data repositories do not support an editable Model Based Definition TDP delivery. The current lack of Model Based Design Tools and Product Data Management (PDM) Suites will hinder the ability to effectively support the 53K program. Specifically impacted areas include the ability to conduct engineering analysis, maintain configuration control, reuse engineering in support products, promote open competition, and process ECP's efficiently. Lack of a Model Based Management Environment has the potential to increase sustainment cost significantly over the anticipated life of the airframe.

Objectives

- Seamless transition and reduction of data concurrency risk from product development through sustainment to disposal
- Integration of engineering, production and business processes across the program enterprise to accelerate delivery of future capabilities
- Develop & baseline LSI tools and processes
- Streamlined sustainment systems and reduced infrastructure cost
- Enables design for manufacturability early in development to achieve largest cost-effective impact

F/A-18 & EA-18G Problem Statement

The present F/A-18 and EA-18G Technical Data Package (TDP) sustainment strategy does not support a 3D Model Based Environment.

- Current enterprise solution only applies to 2D drawing/data (JEDMICS).
- No standardized tool set to support 3D model acceptance criteria
- No standardized 3D Model validation criteria for translated/healed models
- Lack of control will compromise configuration management
- Reverse engineering increases overall costs and cycle time
- Numerous database at multiple locations present configuration issues.

Investigating Implementation of PLM Strategy

QUESTIONS?