

~~Integrated Diagnostics~~

Enterprise Health Management Committee

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New Orleans, LA – EHM Workshop

Committee Name Change

- To better serve our Sponsor's needs the ID Committee is expanding its scope to view the ID Process end to end or (in today's vernacular) as an Enterprise.
- EHM in the Committee name implies a willingness to address the needs of the Sponsor community better because it encompasses the whole Enterprise rather than PHM which still implies that we're focused more on technology than on the broader transition and use (Enterprise) issues.
- The explicit use of "Management" rather than "Monitoring" in EHM conveys the idea of focus on the issues that serve the user by improving the application of monitoring to the areas that are important to him - managing the health of weapons to assure mission completion versus just telling him something is breaking.

Other Activities

- Electronic Prognostic Follow-on Activities
 - Funding for R&D areas identified in study being pursued
- Product Support Analysis Team (PSAT)
 - Dennis Hecht
 - Meetings in Washington DC
 - Identify future requirements for Life Cycle Product Support

Enterprise Health Management – What is it

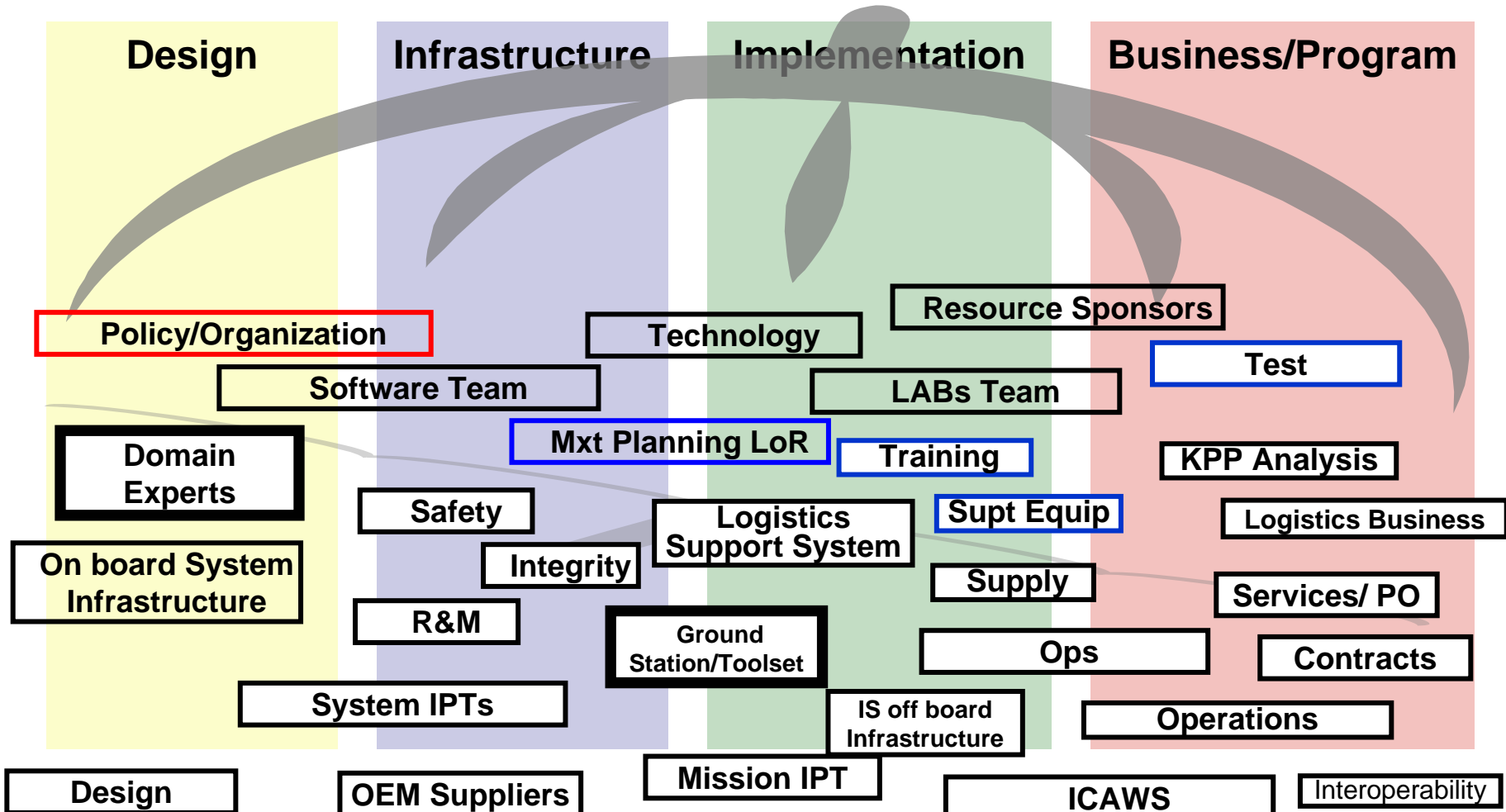
“The capability to make intelligent, informed, appropriate decisions across the Enterprise about design, logistics, maintenance and operational actions based on Health Management Data or Information, available resources, acquisition strategy, and operational demand.”

*Next Generation Enterprise Health Management Decision Support
Solution Targeting Unprecedented Value, Affordability and
Continuous Improvement*

Key Attributes Include....

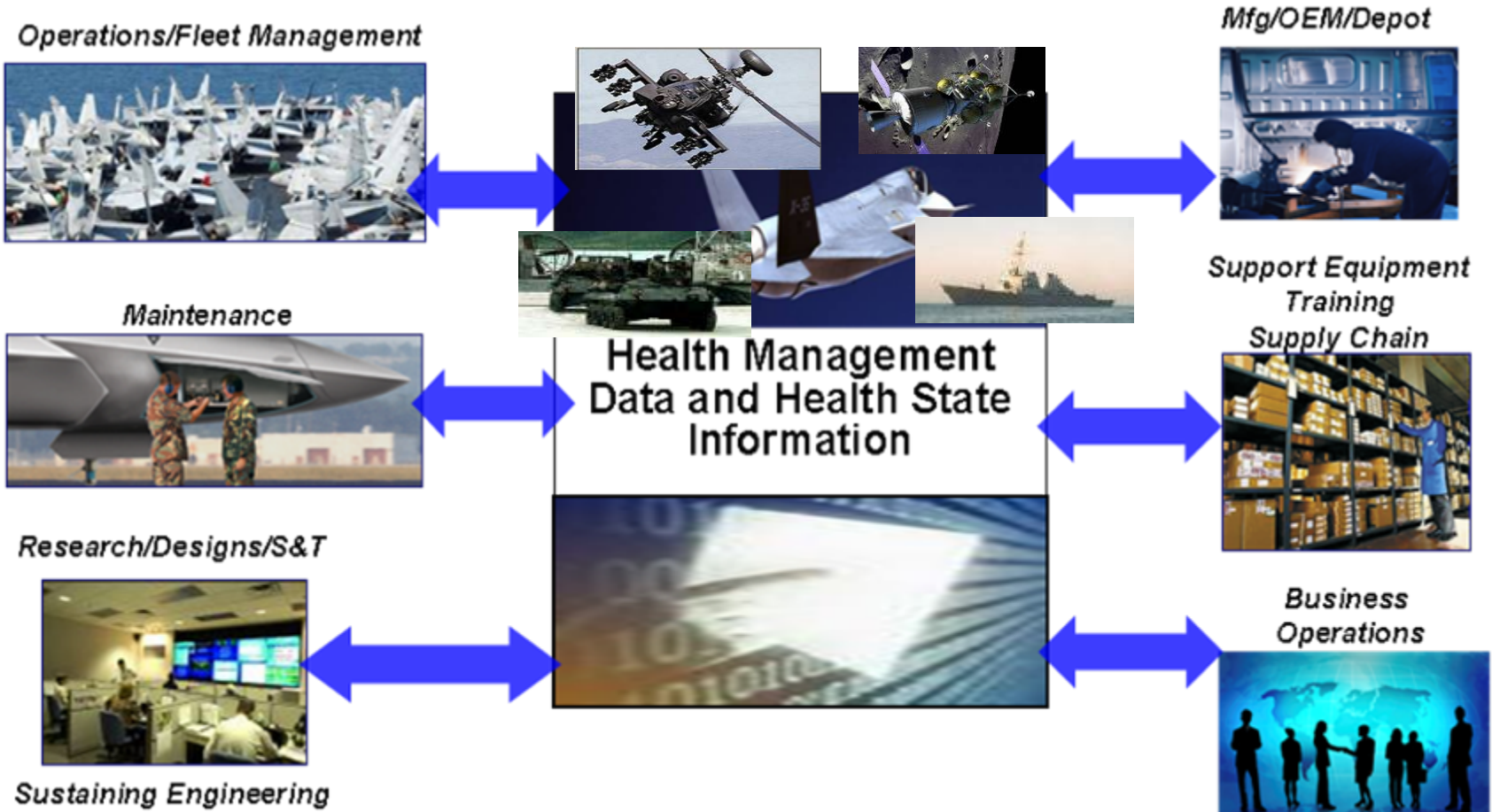
*EHM as a Design Element; Proactive Advisory Generation Based
on Health State; Autonomic; Planned Maturation; Near Real Time
Updates; No False Alarms*

EHM – Who's Responsible



*Responsibility is distributed across All domains;
Need a integrated systems approach*

EHM – Who's Affected



Product life cycle must be considered for applicable transition

**Transformation Expected Across All Elements
Strong Commonality Across Platforms**

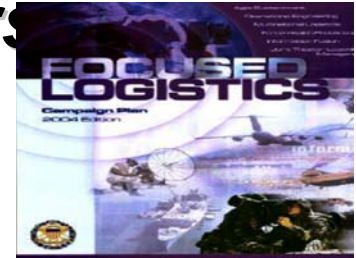
EHM – Who Promotes It

Shared Vision, Purpose & Barriers



Prognostics and Health Management

The capability to make intelligent, informed, appropriate decisions across the Enterprise about design, logistics, maintenance and operational actions based on HM information, available resources, acquisition strategy, and operational demand.



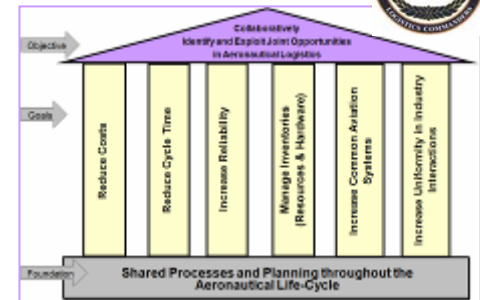
The proactive approach to managing fleet health

SLIM Mission Statement

Integrate WSIP, CBM+, RCM/MSG-3, RAM, MFOQA, EAVI, and AIP efforts. Standardize engineering processes/tools associated with improving system performance monitoring and assessment leading to proactive weapon system management and product improvement throughout the system lifecycle.



CBM+ is the application and *integration of appropriate processes, technologies and knowledge-based capabilities* to improve the *reliability and maintenance effectiveness of DoD systems and components*. At its core CBM+ is maintenance performed on evidence of need provided by **Reliability-Centered Maintenance (RCM)** analysis *and other enabling processes and technologies*.



Enterprise Health Management is the Common Denominator

Problem Statement - State of Practice

- System supportability and affordability goals difficult to meet without EHM/CBM+; O&S costs account for 70% of ownership costs
- Immature data and cost benefit models; difficult to produce numbers for business case
- Contractor and Government organizational structures do not support health management as a new systems engineering “discipline”; lack of overarching authority and leadership for aspects of EHM in a program
- OEMs/Suppliers/IPTs not fully engaged in transitioning viable technologies produced by small businesses; significant number of “valley of death” casualties
- Lack of system level architectural reference model and standards for EHM/CBM+ solutions; core solutions with minimal standardization, reuse or transition
- EHM/CBM+ S&T roadmaps are not integrated across the Services, Agencies and domain IPTs : duplicate core efforts, stakeholder resources are not aligned to achieve vision
- Current practice may produce “friction factor” of disparate capabilities across the enterprise value stream; unsynchronized technologies, interoperability problems, waste and non-value added activity affect transition

The Bridge

Required for Efficiency and Effectiveness

Prognostics and Health Management
 The capability to make intelligent, informed, appropriate decisions across the Enterprise about design, logistics, maintenance and operational actions based on HM information, available resources, acquisition strategy, and operational demand.

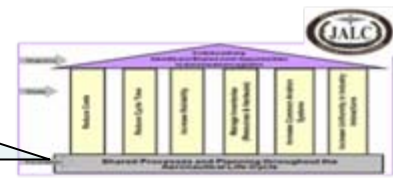


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Focused EHM Framework, Guiding Principles & Collaborative Alliance

Needs, Barriers, Expertise, Funding, Schedule, Data, Roadmaps

STAKEHOLDERS/SPONSORS

Policy & Requirements

Technology Offices

OEM/Integrators

Programs and Platforms

Research Labs

Suppliers

Warfighters

Academia

Small Business

Summary and Action

- **Emerging or Legacy Programs can not effectively achieve the objective independently; Efficiency and affordably factors**
- **Common** fundamental gaps and **challenges** exist across all stakeholders and value streams
- **Need focused program manager guidance and Common Reference Model to achieve alignment of needs and resources**

Leadership provide advocacy to engage and align key stakeholders

- **Execute proposed strategy**
- **NDIA Tasking**
 - **Mature the common Reference Model and guiding principles**
- **Forum to build the Joint Alliance**
- **Community of Practice (i.e. www.hmframework.org)**

NDIA Task

The NDIA EHM Committee Task:

- Evaluate and Mature Common Reference Model
 - Test viability across Key domains (Enterprise, Platforms/Systems, and Stakeholders)
 - High Level EHM/CBM+ Gap/Needs Summary
- Conduct Workshop With Stakeholders
 - Review and mature Reference Model/Framework at system level domain (populate EHM/CBM+ Top Level Gaps)
 - Socialize Common Reference Model / Framework
 - Enhance Baseline Framework Description
 - Produce List of High Priority Gaps & Barriers
 - Collaborate on Defining Path Forward
- Provide a Task Final Report with Recommendations
- Products: Report; EHM guiding principles; 1st Generation gaps towards

NDIA Workshop Events

- Day 1- Provide transformation vision and overview perspectives from government and industry organizations involved in CBM+/EHM initiatives (Plus Government-Industry Panel on S&T Transition)
- • Day 2– Review a proposed EHM framework and set of guiding principles that could enhance transition of viable health management technology to new and legacy weapon systems (Breakout Sessions)
- • Day 3– Framework process application review and follow-on activities (Peer – to – Peer review)

CBM+/EHM Framework Pillar Concept

Business	Architecture	S&T Capability	Infrastructure	Implementation
<p>This pillar addresses the business, program management aspects of the SE approach. Reference Cost Benefit, risk assessment, resources, data classification, verification needs, guidance, policies acquisition strategies, etc. Organizational structures; policies and acquisition strategies.</p>	<p>This Pillar references the various architectures that must be understood or that may effect your solution. There are several on and off system, distribution, storage and utilization architectures. Applicable standards need to be realized.</p>	<p>One must consider all the technologies required to achieve a transitionable solution. There may be dependencies, competing solutions, existing or leveraging solutions</p>	<p>This pillar address the tools, labs, certification, testing required; external dependencies Implementation architectures and hosting architectures</p>	<p>This pillar address the utilization, autonomies, human interface requirements, classification and security; policy changes; maturation path, transition path TRL/MRL strategy Data plans, how do you use it</p>

Framework Definition and Guiding Principles - Applied per Topic

Identify Capability Needs/Gaps/ Barriers Across Domains

EHM/CBM+ Top Level Vision Domain (example only)

Business	Architecture	S&T Capability	Infrastructure	Implementation
<ul style="list-style-type: none"> •Models Operational Case Business Case Cost Benefit Trade-off Safety/Engr trades •Resource Alignment <ul style="list-style-type: none"> •Organization •Policies •Data Mgt Plan •Standards •Requirements 	<ul style="list-style-type: none"> •On-Vehicle •Off-system •Distribution •Software •Utilization •Downlink •Recording •Data Compression •Throughput •Standards/Rqts •Data Format 	<ul style="list-style-type: none"> •Sensors •Health State Methods •Prognostics •Decision Reasoning •Enhancements to Existing 	<ul style="list-style-type: none"> •Platform Interface •Logistics System Interface •Ground Station Environment •Test & Integration Toolset •Data Mgt and Support •ATE – Smart TPS 	<ul style="list-style-type: none"> •Maturation/Transition Path •Process integration •OPS Planning •Tool Sets / Processes •Tech Insertion •Sustainment Decision Support •Repository Solution •Distribution •Data update/Mgt •Verification •Certification

Moving Forward Effectively

- **Provide a focused set of EHM Guiding Principles and Common Reference Model**
 - Enterprise solutions
 - Barrier and solution identification
 - Resource Alignment (Expertise, funding, data, schedule, transition path)
 - Integrated and dynamic roadmapping
- **Drive a Coalition Alliance - (*Best of the Best*)**
 - Socialize needs, lessons learned, solutions, maturation & transition opportunities; Cop (Community of Practice)
 - Comprised of Stakeholders across sponsors, services, agencies, industry/small business, academia, and International
 - Drive prioritize needs, resource planning, future tasking, standards, education, policy & guidebook

***Enhanced Transition through
a Common Approach, Awareness, and Knowledge***

EHM Framework Concept Overview

- *Identify gaps/barriers for effective execution of health management technology insertion plans*
- *Provide a common vocabulary and a standard architectural reference model for system health management solutions*
- *Plot future health management technology roadmaps;*
- *Coordinate across health management domains to leverage S&T investments*
- *Enhance affordability, commercialization and transition of health management technologies*

Workshop Principal Objectives

- develop awareness of EHM transition
- vet and encourage adoption of a “common framework” for conducting S&T activities
- discuss and identify system level gaps in common framework and guiding principles for effective and timely deployment of CBM+/EHM capabilities

Six-point Transition Plan

- Understand the budget process, its timing and the decision makers
- Follow the money and get some
 - Opportunities exist to mature products
- The PM is not your friend
 - Serves as judge and jury. Your task is to make him successful
- Demonstrate contribution to what is important to decision makers
 - readiness, cost, log footprint.
- Minimize your burden to program
 - Cost, complexity, maturity and risk
- Communicate your value and build relationships.
 - Be self aware of how you communicate. Know the audience.

EHM Transition Workshop – Next Steps

- **Key Objectives Met – Thank You**
 - **Framework and Process Related to Visions Presented in Day 1**
 - **Framework Vetted and Improved – High Level Gaps and Content**
- **EHM Transition Action Group Established – All Workshop Participants (Duties Below)**
- **Whats Next**

What's Next

- Generate Outbrief
- Vet Outbrief
- Schedule and deliver workshop out brief to key stakeholders
- Generate final report including outbrief reactions
- Vet and issue final report