

Headquarters U.S. Air Force

Fly – Fight – Win

Data Management as the Key to Prognostic Capability



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13 Nov 2007**



eLog21 Campaign Initiatives

ARCHITECTURE & GOVERNANCE

Logistics Enterprise Architecture (LogEA)

Portfolio Management

Air Force Data Strategy

Performance Management

Product Support and Engineering

Supply Chain Management

Expeditionary Operations and C²

Maintenance, Repair and Overhaul

← **Global Log Supt Center** →

- Total Life Cycle System Management
 - Prod Supt Camp
 - AAIP
- **Condition Based Maintenance+**
- Asset Marking and Tracking
- Demand Management
- Product Life Cycle Mgmt

- Integrated Planning System (IPS/APS)
- AFFVESA, JPPC-AF, ACP-AF, NWC Consolidation
- Purchasing Supply Chain Management (PSCM)
- Next Gen Log Read Sdqn
- Strategic Distribution
- Weapon System Supply Chain Management

- WFHQ/ Agile Combat Support C2
- AF Common Operating Picture
 - A4/7 COP
- Decision Support Tools

- Maintenance Strategic Plan
- Repair Enterprise 21
 - Single Off-Equip Net
- Re-engineering Depot Maintenance (DMT)
- AF Lean Maintenance Enterprise Integration

Centralized Asset Management

ENABLING PROCESSES AND TECHNOLOGY

Agile Combat Support (ACS)/Assured Connectivity

Workforce

AF Smart Ops (AFSO21)

Change Management (CM)

Capability-Based Programming (CBP)

IT Strategy/Expeditionary Combat Support System (ECSS)

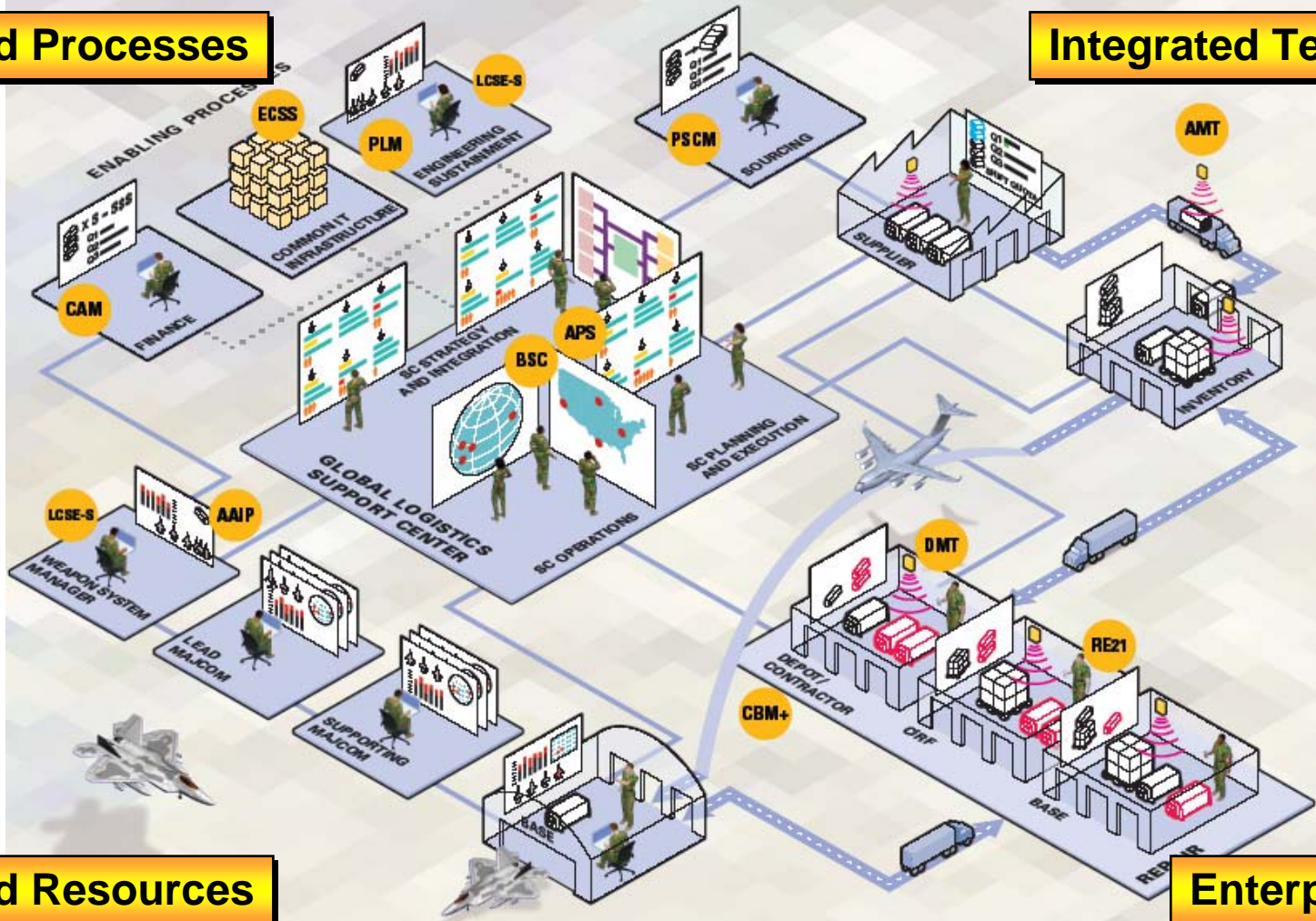
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Future Process Model

Integrated Processes

Integrated Technology



Optimized Resources

Enterprise View

Seamless end-to-end supply chain operations delivering the right support, at the right price, in the right place, at the right time -- every time



ECSS Program Overview

- Improve warfighter capability by transforming AF Logistics' business processes and leveraging ongoing initiatives & capabilities that IT can deliver today

Objectives

- Establish near real-time modernized information system
- Apply best commercial practices
- Utilize COTS based solution
- Plan and execute obsolete legacy retirement (~250 systems)
- Increase equipment availability by 20%
- Reduce annual O & S cost by 10%





COTs Lessons Learned

- **Past COTs attempts have generally failed**
 - **Weak governance and functional oversight**
 - **Didn't really understand the business processes**
 - **Little or no change management and training**
 - **Immature products & undercapitalized vendors**
 - **No incentives to implement**
 - **Data cleanup effort under appreciated & under valued**
 - **Limited testing and test environment**
- **Same lessons observed in Industry**

MUST ADDRESS TO SUCEED



Maintenance Data Collection

- **Data is collected to serve a process not just to collect data**
 - **Engineering and Product Data**
 - **Production and Quality**
 - **Supply Chain**
- **Maintenance data quality is poor but so is all of our data**
 - **Fat fingering, discipline, lack of edits, interfaces**
- **Maintenance data is underutilized – mostly reactive**
 - **Missing key elements e.g. IUID and depot inputs**
 - **Processes do not drive to use of data e.g. engineering**
- **Near and Long term efforts underway to address maintenance data**
- **This problem and solutions are not limited to maintenance data**



Data Improvement Initiatives

- **Understanding the Problem:**

- AFMLA and AFMC/A4 conducting a studies on mx & supply data to help guide the clean up of legacy data

- **Addressing Fat fingers:**

- IT driven improvements are/will help improve near term collection e.g. CAMS GUI, POMX, REMIS Edit rehosting

- **Addressing Discipline**

- IUID Implementation will address serialization needs
- Product Life Cycle Management (PLM) initiative addresses product data clean up and conversion
- ECSS dramatically changes production & quality data
 - ERPs demand a significantly more disciplined data approach than anything we have ever done

- **Addressing Utilization**

- D&SWS Life Cycle System Engineering – Sustainment is driving a relook at what we collect and how we use it
 - Predictive use – RCM, Condition Based Maintenance, et al
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AFLMA

Near Term Efforts

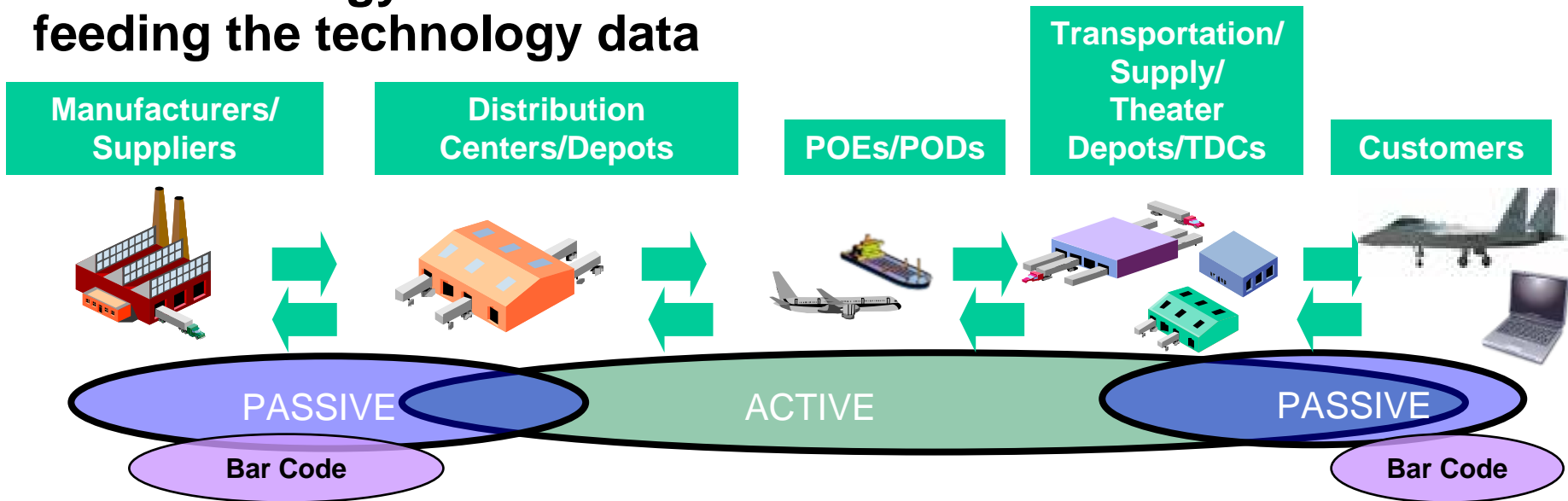
- **AFMLA Data integrity study of IMDS & REMIS**
 - **Bounding and prioritizing the quality issues**
 - **Developing repeatable process to support ECSS**
 - **Capturing the functional impact of data quality issues**
 - **Benchmarking the level or effort to identify, recommend and act on data quality issues**
 - **Defining remediation criteria (Fix-Now, Fix prior to or during ECSS Migration, Fix after migration to ECSS)**

 - **Focus on Metrics Data**
 - **Identify near-term process or technology improvements in reporting accurate status and utilization information**
 - **Address lead-time ECSS data migration issues**
 - **Collaborating with ECSS on a common method and toolbox**
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The AIT Enabled Data Collection

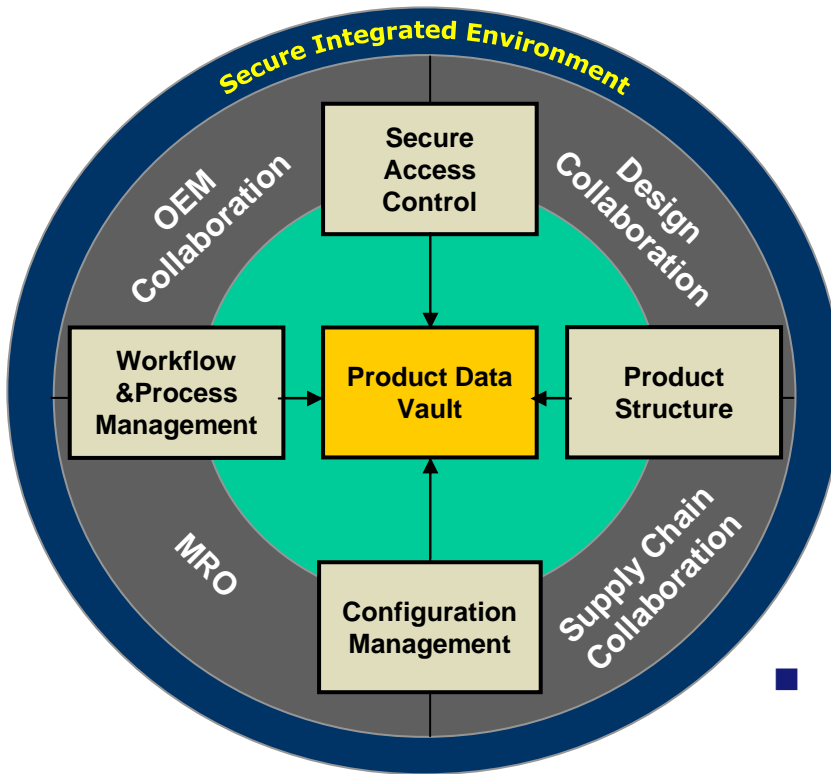
- AIT eliminates the need to collect the what (item/part, IUID, location, time, date, description, quantity, etc.)
- The human in the loop captures the how (receipt, shipment, removal, install, disposal, etc.)
- The technology feeds the airman information vs. the airman feeding the technology data



Minimizes human inputs: Data is captured not entered



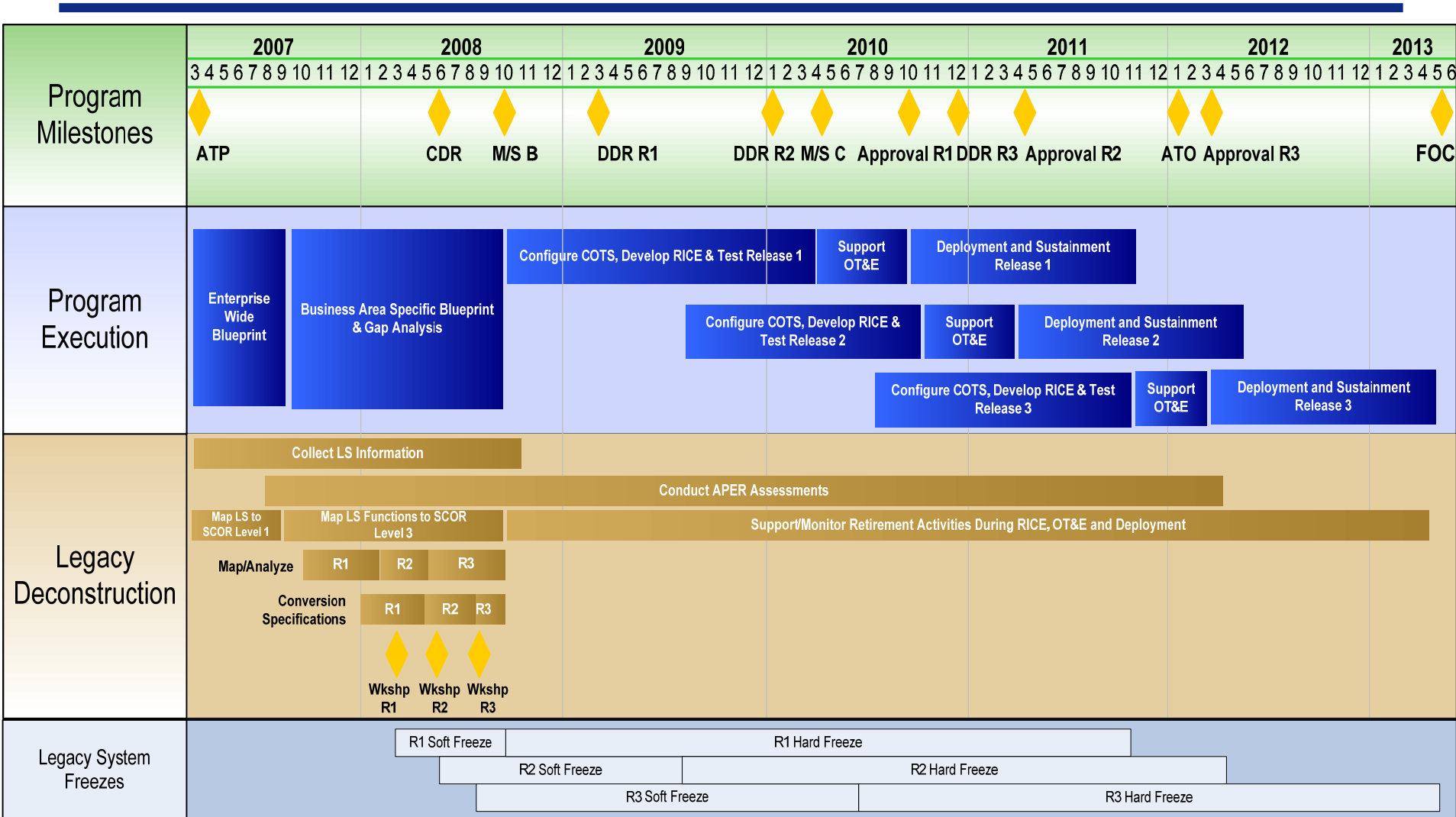
Product Life Cycle Management (PLM)



- Centralized Data Management for:
 - TOs
 - BOMs
 - Drawings
 - Illustrated Part break-down
 - Repair Manuals & Procedures
 - Key Performance Parameters
 - Requirements & Specifications
 - Interchanges and Substitutions
- Standardizes Data Management Processes across commodities
- Stores data for root-cause and product improvement analysis and planning
- Demands AF & OEM Integration and digital technical data vs. paper



ECSS Legacy Deconstruction





Impact on Data Collection

- **Deconstruction and Transformation**
 - **ECSS must be initialized with clean data from the legacy environment**
 - **Not all data for ECSS is equal**
 - **Not all Legacy Data will be Migrated**
 - **99.9999 should be the long-term quality goal**

- **Six-Sigma is achieved via incremental Good-enough's**
 - **Start with the most unforgiving data sets**
 - **Understand and Manage the impact of quality compromises**
 - **Fix the process and the data**
 - **Manage Functionals and IT by Metrics**

Clean data is an Air Force Responsibility



Current Life Cycle Systems Engineering

Systems Engineering

LCSE (Pre-Milestone C)

System Mgt, Requirements Mgt, Verification & Validation, Technical Control & Mgt, Configuration Mgt, SOR & SOS Certification, Planning, Design, Risk Mgt, Inspection & Maintenance

Transition Planning

Other

HSI, AIP & MFOUQA, MQ&A, MOSA, CSI, System Safety, etc

LCSE (Post Milestone C)

System Mgt, Requirements Mgt, Verification & Validation, Technical Control & Mgt, Configuration Mgt, SOR & SOS Certification, Planning, Design, Risk Mgt, Inspection & Maintenance

Weapon System Integrity

AVSIP

MECSIP

FSIP

PSIP

ASIP

Individual Aircraft Management

Technical Control & Management: Technical & Design Reviews, Architecture, Tech Maturation/DEMO, Tech Measurements (KPP, TPM, Metrics), Decision Analysis, Certifications, **Ops Monitoring**, Deficiency Reporting, Training.
Inspection & Maintenance: **RCM Updates, FEMCA Updates**, Reviews, TO Updates (-6 & -06), Workspec & MRRB Updates, **CBM+, Prognostics, RAM, System Monitoring, System Performance Analysis.**

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Life Cycle Systems Engineering with LCSE-S

Notional

Initiatives with strong interfaces/links with LCSE-S: POMX, IETM, ECSS MRO (IFS), Data Workbench (EPAE), Prognostics Toolkit, AIT/AMT, CAM, MFOQA

Systems Engineering

LCSE (Pre-MS C)

System Mgt, Requirements Mgt, Verification & Validation, Technical Control & Mgt, OSS&E, Configuration Mgt, SOR & SOS Certification, Planning, Design, Risk Mgt, Inspection & Maintenance

PLM

Transition Planning

Other

HSI, AIP & MFOUQA, MQ&A, MOSA, CSI, System Safety, etc

LCSE (Post-MS C)

System Mgt, Requirements Mgt, Verification & Validation, Technical Control & Mgt, Configuration Mgt, SOR & SOS Certification, Planning, Design, Risk Mgt, Inspection & Maintenance

LCSE-S

CBM+, RAM, WSIP, Prognostics (RUL/SLA), Diagnostics Monitoring, EAVI, R&M System Performance Metrics, ELMP & FSMP, RCMA/FEMCA, and Corrective Actions or New Requirements

Weapon System Integrity Programs (WSIP): ASIP, FSIP, ENSIP, MECHSIP, AVSIP, and Individual Aircraft Tracking (IAT)

Technical Control & Management: Technical & Design Reviews, Architecture, Tech Maturation/DEMO, Tech Measurements (KPP, TPM, Metrics), Decision Analysis, Certifications, Deficiency Reporting, and Training.

Inspection & Maintenance: Reviews, TO Updates (-6 & -06), PDM Work Specifications, and MRRB Updates

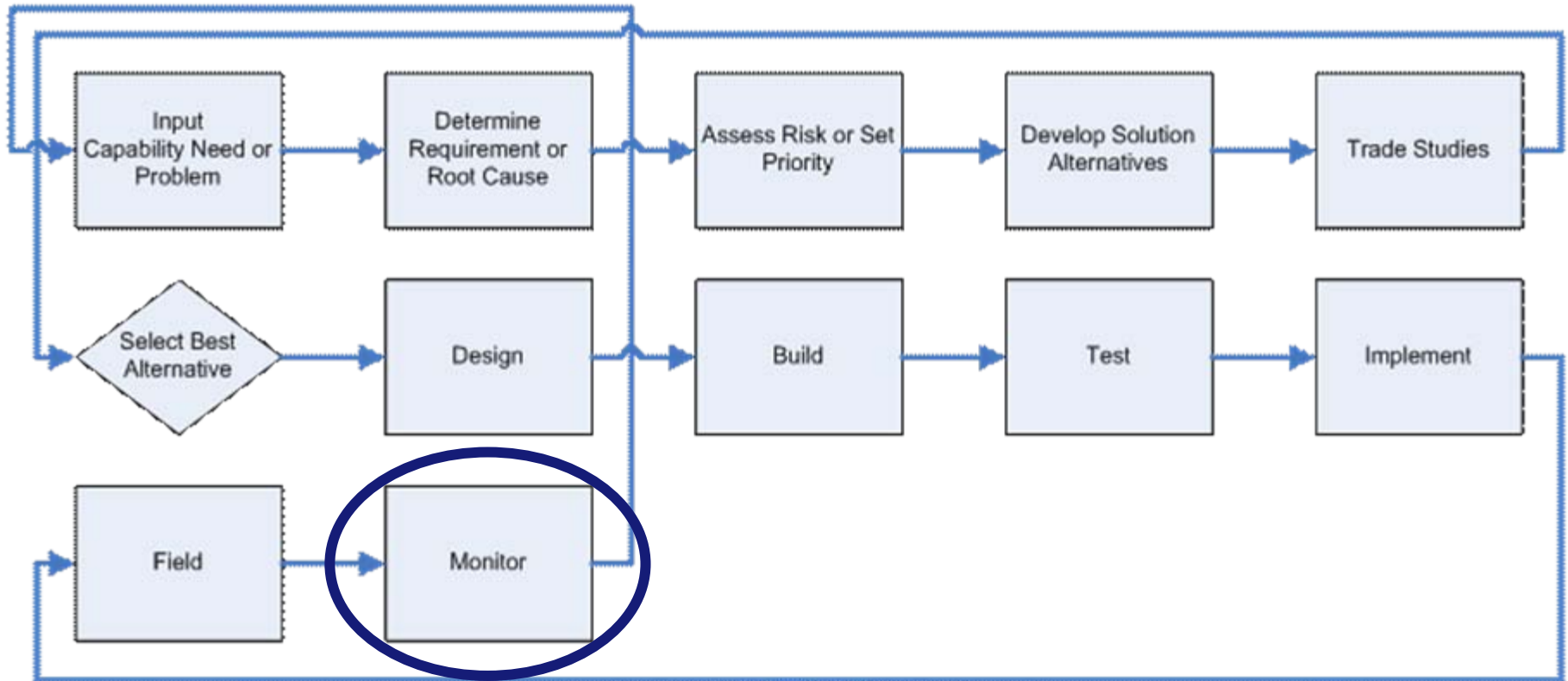


Life Cycle Systems Engineering - Sustainment

- Represents the integration of eLog21 and AFSO21
- Process Improvements and Objectives for:
 - Product Lifecycle Management
 - Condition Based Maintenance Plus/ Prognostics
 - Weapon System Performance Analysis
 - Weapon System Performance Improvement
- Defines data needs and metrics
 - Key Events
 - Event Thresholds
 - Sensors and Controllers
 - MRO Data
- Drives Engineering Analysis



Systems Engineering - Current State

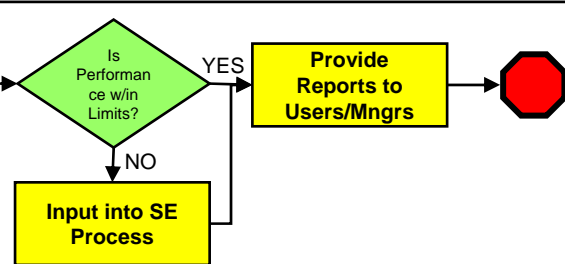
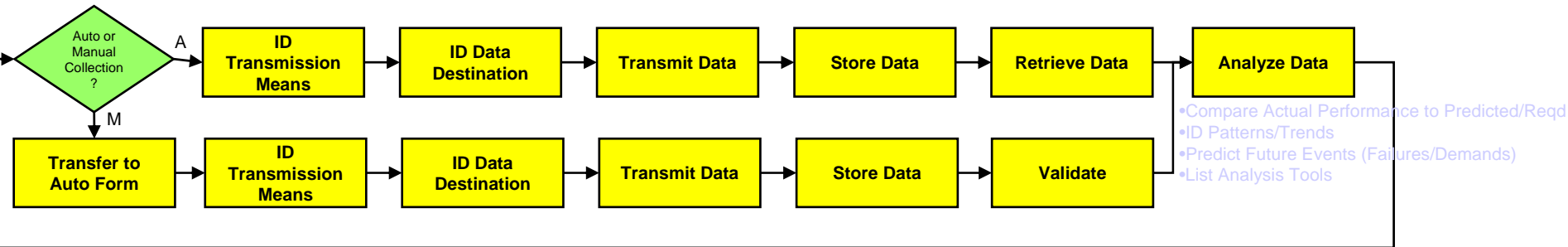
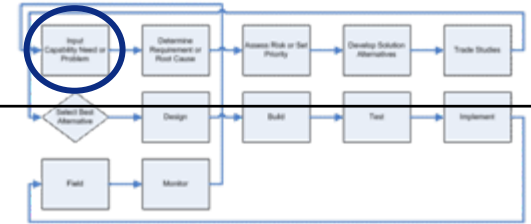
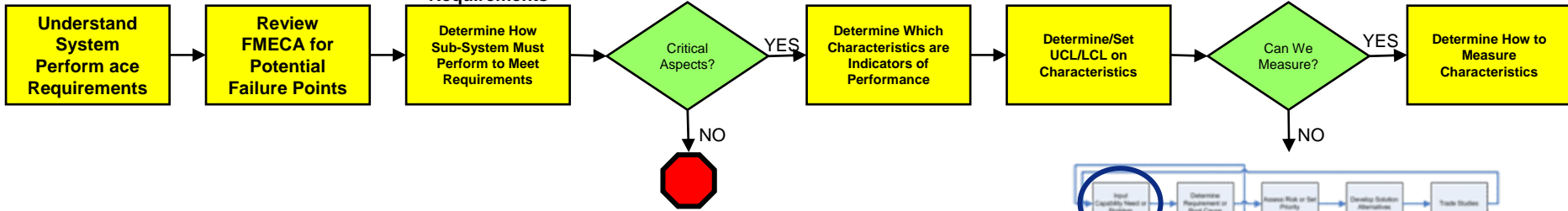




Monitor - Current State

Core – Process Map (How is the data monitored?)

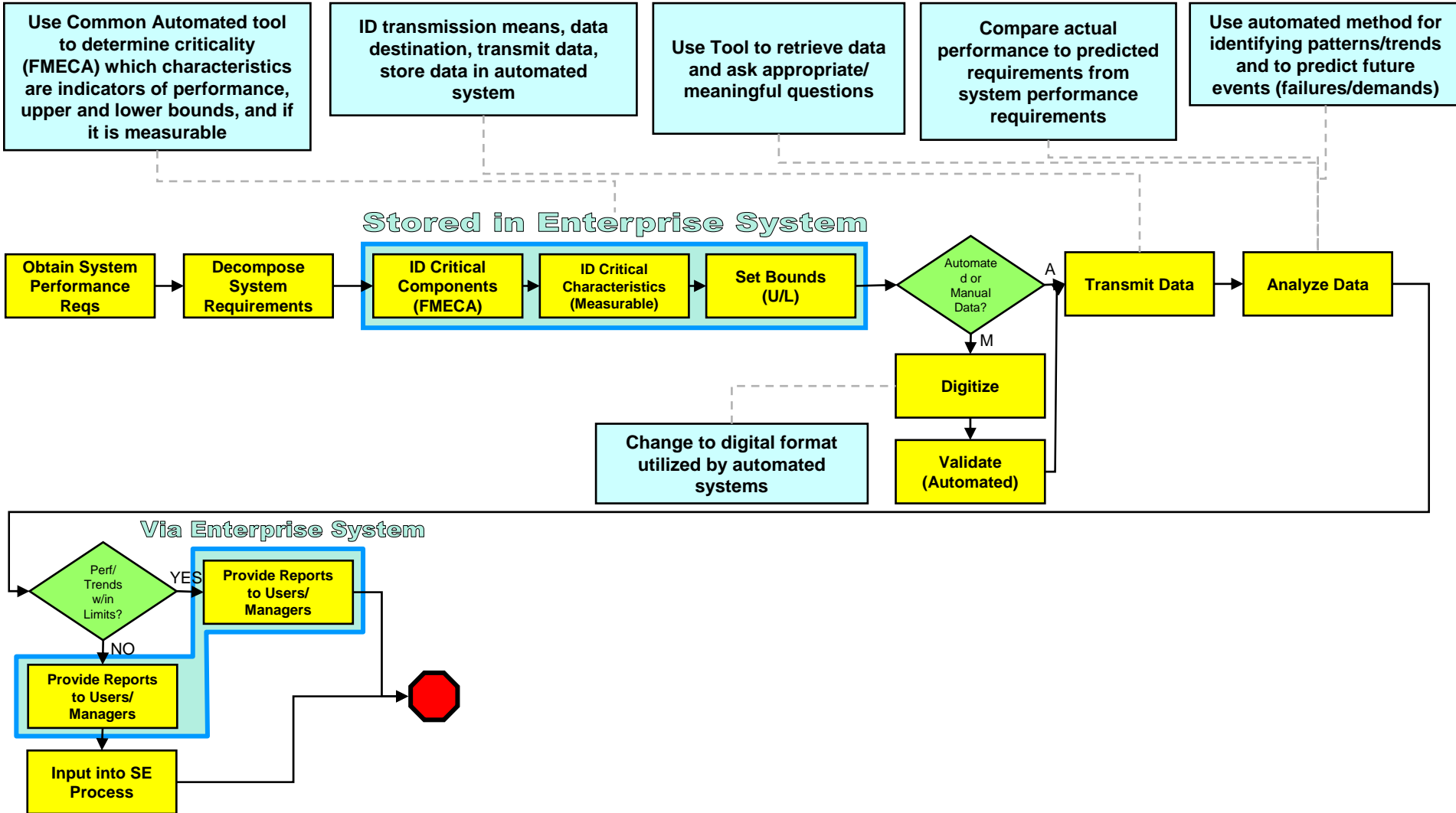
Allocates Requirements





Monitor - Future State

Core – Process Map (How is the data monitored?)





Summary

- **Improved Maintenance Data Collection is being addressed by:**
 - **Transformation**
 - **Life-cycle Systems Engineering – Sustainment**
 - **Condition Based Maintenance**
 - **IUID**
 - **Technology Enablers**
 - **AIT (Near-Term)**
 - **PLM (Near-Term & Long-Term)**
 - **ECSS (Long-Term)**
 - **Analysis**
 - **AFLMA (Near-Term)**
 - **ECSS Legacy Deconstruction and Migration (Near-Term)**
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Questions