Maintenance Management Information eXchange Model (MMIXM)

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What Is MMIXM?

MMIXM will be an FAA data standard to support the exchange of Operations & Maintenance information between NAS systems. The use of standardized maintenance data will increase data quality and availability between stakeholders, enabling operational benefits such as increased efficiencies and situational awareness.

MMIXM is developed in accordance with the standards and best practices of existing data models in use at the FAA.
What Will MMIXM Do?

Improve quality of data exchange between existing systems and provide a foundation for a new generation of maintenance-related systems.

MMIXM-enabled capabilities could include:
• Instant and accurate asset details
• Instantly view hierarchy of parts for any system, down to the lowest replaceable unit
• Automated coordination of maintenance activities and outages
• Instant access to all asset documentation
• Instant geo-mapping of outage information
• Automated identification of available ATSS personnel
MMIXM v1.0 Systems-of-Interest

Certifications/Credentials

Inventory and Parts

Major Assets

Radios and Other Equipment

NOTAMs

Event Logging and Coordination

Flight Inspection
Approach to Developing the MMIXM Standard

Collaborate with Stakeholders
- Specialist interviews
- Review schemas
- Collect sample data
- Documentation reviews
- Business process analyses

Prototype and Evaluate

Data Exchange Requirements and Operational Data Description

Leverage Existing Standards
Operational Data Description Process

**MMIXM Conceptual Model**

- **Process Flow Diagrams**
  - Develop process flow diagrams from representative maintenance scenarios
  - Explicit identification of data exchange elements from automated or manual interfaces

- **Operational Data Description**
  - Naming Conventions
  - Data Dictionary
  - Organizational Hierarchy

- **Existing Schemas**
  - Bottom-up review of existing schemas of individual systems
  - Identify data elements based on general understanding of interactions between systems
Part Failure Scenario – Initial Process
Leveraging External Standards

**FOR:**
- Harmonization
- Consistency
- COTS support
- Speed of development
- Don’t reinvent the wheel
  - Mature/proven

**AGAINST:**
- Size
- Complexity
- Dependencies
- Not invented here
  - Instability
  - Low Adoption
Leveraging External Standards

• **National Information Exchange Model (NIEM)**
  – Core model has general concepts applicable to many domains
    • Address
    • Time
    • Location
    • Schedules
    • Associations

• **MIMOSA**
  – Open information standard for Operations and Maintenance

• **AIXM and FIXM contain “shared” concepts with other exchange models**
  – Shared concepts include:
    • Units of Measure
    • Navigation Equipment
    • Runway
    • Airport
Challenges

• Getting sufficient input and feedback from stakeholders
  – Input includes existing schemas, data exchange requirements, and sample data so that we can map their data to MMIXM and provide sample messages
  – The more feedback from stakeholders the better!

• Accommodating semantics from different FAA organizations
  – Developing a common language to support intercommunication

• Building a general standard that accommodates legacy FAA systems
Current Shortfalls

- Multiple methods for identifying assets
- Incomplete asset information is available in many systems, including part revision numbers
- Inconsistent location information for assets
- Performance reports lack standardization between organizations
- Difficult to identify available maintenance staff
- Imprecise and inconsistent data
- Field staff must manually transfer and cross-check data between various systems

**Bottom line: Field staff spends too much time on administrative chores due to limited automation and standardization**
MMIXM v1.0 Development Schedule

- Development Start: 08/24/15
- MMIXM Project Management Plan: 09/25/15
- 3rd MMIXM Work Group Meeting: 12/25/15
- MMIXM Process Document: 01/25/16
- First Iteration of Draft Products: 06/19/16
- Second Iteration of Draft Products: 09/27/16
- Third Iteration of Draft Products: 02/24/17
- MMIXM Beta Version: 05/16/17
- Prototype Capability Development: 04/15/17
- Prototype Capability Testing: 01/05/17
- Model/Schema Refinement: 07/24/17
- MMIXM Version 1.0: 04/15/17
Questions?