



Executive Roundtable:

MRO IT: Business Priorities for Data Standardization

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With extensive processes, transactions, and sources of information in the aviation maintenance, repair and overhaul (MRO) ecosystem, data management continues to be a foremost source of MRO inefficiency, both in time and cost. Although the modern aircraft brings enhanced reliability and advanced intelligence capabilities, current decision-making systems and tools may be unable to fully process, mine or analyze the additional, incoming data.

The labyrinth of the MRO lifecycle compels stakeholders (operators, service providers, manufacturers, suppliers) to collaborate on reducing turnaround time and making maintenance operations more efficient. All agree that data sharing is necessary to streamline this industry, yet competitive considerations, such as intellectual property and restricted access, and inconsistent data formats and systems continue to be considerable barriers.

The Aviation Week Executive Roundtable: MRO IT is among roundtables held throughout the world on areas of significant concern and interest to a broad range of aerospace and defense organizations. Aviation Week began holding roundtables in 2004 to bring together multiple stakeholders in a neutral environment to address issues critical to the aerospace and defense communities, with the goal of identifying actions to be taken by individuals or organizations that will benefit the enterprise as a whole.

The focus of the Oct. 10 Aviation Week Executive Roundtable held at the RAI in Amsterdam, The Netherlands, was to determine business requirements and reasons for data standardization and sharing, as well as define first approaches towards integration of maintenance systems. The goal of the roundtable was to reach a collective analysis and list of priorities to define the business case behind data harmonization and integration in the next 6-12 months.

The roundtable was hosted by René Kalmann, Program Director Maintenix at KLM Engineering & Maintenance and Lee Ann Tegtmeier, Aviation Week & Space Technology's Managing Editor, Civil & MRO. The meeting was sponsored by The Boeing Company.

This was the fourth MRO IT roundtable, and the second in the European region. The first MRO IT Europe meeting in 2010 established that data standardization and enforcement of standards is critical to improving data sharing, cooperation across value chains, data storage and access. With uncertainties in intellectual property and required investments in new systems and technologies, there needs to be an integrated definition of benefits for all parties involved across the value chain.

Organizations participating in the roundtable were Air Livery Ltd/Air Works; Air Supply Consulting; AirBerlin Group; Airbus; BAE Systems; Bombardier; British Airways; Conduce Consulting; D-SIMLAB Technologies Pte.

Ltd.; easyJet; Egypt Air Maintenance and Engineering; FCE Frankfurt Consulting Engineers GmbH; Finnair Technical Services; HEICO Aerospace; IBM; InfoTrust Group; KLM; KLM UK Engineering Limited; Oracle; PGA-Portugalia Airlines; PIA Engineering; Pratt & Whitney; Rolls-Royce; Safran Corporate Strategy; StandardAero; SunExpress; TAP Portugal; Technology Solutions; and Turkish Technic.

Roundtable participants divided into six work groups that were challenged to respond to a set of questions that focused on three topics:

- 1) Identify and prioritize business requirements and reasons for data standardization and sharing.
- 2) Define specific capabilities of the information/data flow on user access on a restricted or "need-to-know" basis.
- 3) Determine processes for integrating legacy and new aircraft data, as well as priorities on which information data should be integrated first.

In an overwhelming agreement, participants determined that the first business priority should be to standardize part number identification in the supply chain and materials, followed by sharing aircraft health monitoring data and integrating data within the organization. However, industry commitment, competition and no open-source culture are persistent barriers. Stakeholders must agree to a unitary definition on data access and usage.

KEY FINDINGS:

- Standardizing Part Number Identification in supply chain and materials management was recognized as the top business priority. The data on the lifecycle of the part should in a standardized format, and standardization should start with high value parts.
- Operational leading action-items should be sharing aircraft health monitoring data, and internal integration of data from different sources, such as engines and airframe.
- To move the industry forward with these business priorities, it is important for organizations to shift from a reactive state to a predictive and proactive behavior for optimal maintenance programs.
- The legality, such as use (just for proper use of maintenance), access (intended vs. un-intended), decision vs. action, needs to be determined and agreeably defined. However these terms need to be defined without lawyers.

Details of topical conversations in the work groups follow.

BUSINESS PRIORITIES BEHIND DATA STANDARDIZATION AND SHARING

Roundtable delegates brainstormed to identify and prioritize business requirements (internal and external) and reasons for data standardization and sharing.

What factors drive the business case? What is the purpose for sharing data?

- Pros:
 - o Safety.
 - o Efficiency - maintenance program optimization (aircraft availability, reliability, lease returns).
 - o "The greater good for safer aircraft" - Motivation for users and stakeholders (operators, MRO, lessors, OEMS, etc.).
 - Same reasons why Wikipedia succeeded over MS Encarta - Invented HTTP and gave it away and now it is widely accepted and used every day.
 - MRO wkinomics (mass amount of sharing).
 - o Reliability - if shared with industry, real-time and industry wide reliability reports, especially on component information, such as repairs and defects.

- Leverage of best practices.
- Proactive decisions - decision support.
- Cons:
 - Competitive advantage.
 - Investment costs and time.

What are the key measurements to determine these factors?

- Success rate/incompetency of maintenance.
- Dispatch reliability.
- Cost savings/benefits.

*Are we measuring the financial benefit accurately and consistently across the industry?

Identify the business priorities for each party - Airline operations; MRO; Asset management (materials); Supply chain?

- Operations – aircraft availability.
- MRO – effective maintenance planning.
- Supply chain and material – standardization of Part Number Identification (P/N ID).
- Individual priorities directly related to their own strategic goals, which almost always comes down to cost.
- Mobility is and will be the ultimate driver because it will allow IT to be integrated into MRO operations (the ramp/ the aircraft).
 - Example: Mobility will force or drive the P/N ID in supply chain to be standardized and electronic.

Based on the answers above, what would be 3-5 “top priority” business requirements for the whole organization?

- Internal data integration from different sources/locations/departments/businesses.
- Installation/enhancement/upgrades for appropriate software to receive information and support modern aircraft.
- Aircraft health monitoring.
- Training for proper personnel to process, analyze and handle the data.
- Dependant on individual business strategic goals:
 - Airline – flying hours – in the air for the least cost.
 - MRO – TAT (competitive edge).
 - Parts Supplier – volume/margin.
 - Lessors – asset value.
 - OEMs – being the best.
 - Software vendors – sales.

What will data standardization help to make MRO operations more efficient and help lower maintenance costs?

- Sustainability – future use of data for longer periods and other applications.
- HOW will data sharing drive MRO efficiencies? - shorten tech lifecycle and leverage nextgen technologies.

SPECIFICATIONS AND RESTRICTIONS ON INFORMATION ACCESS

Attendees defined specific capabilities of the information/data flow on user access on a restricted or "need-to-know" basis.

- We know the data flow, that’s not the problem.

What processes (ex. aircraft transfer, component, repair, etc.) need to have standardized data first?

What associating data need to be standardized electronically first, and why?

- Aircraft/parts identification – part lifecycle (from cradle to the grave).

- Start with high value parts.
- Any process for a handoff for intended use - I have info and I need to give it someone else (internal dept and/or B2B. Challenges seen more on B2B (OEM, MRO, airline).
 - Transfers.
 - Configuration/customization.
 - Maintenance planning and records.
 - Conforming to standards/regulation.

Who are the stakeholders that need access?

- Data owners (OEM; Operator/Owner; MRO; Regulatory bodies; Logistics, etc.) and anyone who needs to make decision/take action.
- Any “legal entity” in the product’s life cycle and information life cycle.
- There are also un-intended stakeholders...

Identify the purposes and requirements of these stakeholders to have access to pertinent/restricted data.

- Each stakeholder’s interest in the data is already well-established and known.
- Intended vs. un-intended.
- To make a decision or take an action:
 - Conformance to standard.
 - Access to maintenance history.
 - Confirmation of training/competence.
 - Maintain re-sell value (“sell-ability”).

What are current strategies on defining user access to information/data?

- Currently there is no strategy - it’s all trial and error right now.
- There is no restricting access within a company, only restriction strategies between companies.
- How user access is defined today:
 - Documents – the “information” is physically delivered on a need-to-know basis or emailed.
 - Reactive process.

What are the obstacles that they run into with access/restricted data?

- No consistency - not all data is electronic (some on paper).
- Lack of technology/integration.
- Protection against un-intended use – too many barriers on un-intended use that it is hindering intended use. Then intended use is not happening.
- If data is too difficult to access, there is non-use and ultimate result is bad decision. Higher cycle time means higher dollars. Where’s the trust?

E-data standard exchange and interoperability - What’s being exchanged, how is it being exchanged?

- Spec2000 and standards within legacy systems. There is interchangeability takes time in transforming data.
- Reliability data.

What would be the key measurements to determine success of these factors?

- Adaptation – as soon as we see airlines adapting and OEMs supply parts in Spec2000, the number of companies/organizations adopting the standard would be the measurement.

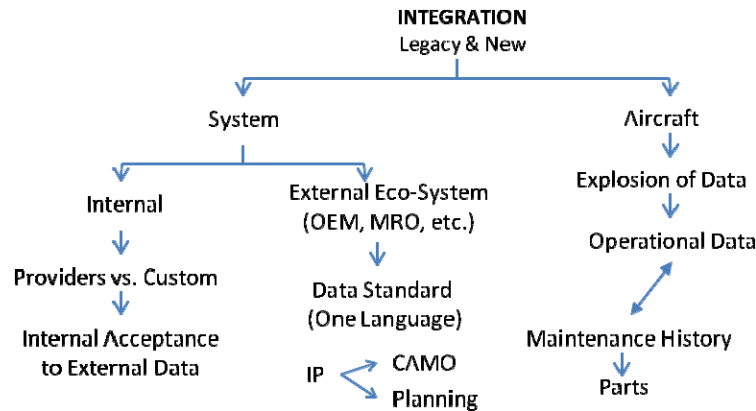
6-12 month Action Items:

- Kill paper and PDF. XML is smart and fast.
- Need to define legal terms (use, access, intended, un-intended, decision vs. action) without lawyers. “Use” means just for proper use of maintenance.
- Define measures of risk management - is risk issue higher on the ‘intended’ or ‘un-intended’ side?
- Industry training - data process training standard exist, we just don’t comply. Maybe we’re not executing because everyone’s not trained.

INTEGRATION APPROACHES TO LEGACY AND MODERN SYSTEMS

Table participants determined processes on integration of legacy and new aircraft and engine component data, as well as priorities on which information data should be integrated first.

- Due to more problems/barriers with data sharing between companies rather than internally, discussions focused on the inter-company data.



How is your data integrated and managed today, specifically related to aircraft, engine and component data?

- Each data set from the different sources is collected in separate systems, and then integrated manually.
- Internal solutions works fine. However, it does not work very well with vendors.

What are those barriers to integrate today?

- Competition/ intellectual property.
- Investment – may already have invested in their internal system, so need to re-coup costs?
- No open-source culture -> unwilling to be honest and share best practices.
- MRO software customers are not able to force vendors, OEMS and other big companies.
- Complexity and large amount of exceptions.

What are some real-world proven best practices and applications to overcome the barriers, whether from your own organization or others?

- Other industries that share a lot of information today – pharmacy; banking; retail (ex. Wal-mart using RFID tags).
- There are a few commercial solutions (i.e. AeroExchange).

If given the task of providing a solution in month, what would they be? Determine potential solutions that you would be able to instill/implement in your own office to overcome these barriers.

- Building block approach – start with smallest sets, such as parts, instead of entire systems. Then move onto another set, such as assembly.
- 80% of the component exchange related data could be defined in a month's time.
- Use existing solutions instead of creating a new one - find the best solution that best fits your company's needs among the available commercial solutions.

What would be the lifecycle cost-benefit analysis for data migration?

- Translation is better word/solution than 'migration'.
- Cost-benefit elements are increased productivity, asset availability, motivation and business flexibility.
- Cannot determine exact numbers in lifecycle costs, but certain on there being too much inefficiency.

**What drives you today vs. what will drive you in the future? Where might we be looking into the future?
How will these business priorities shift/change in the next 2 yrs, 5 yrs?**

- Move from reactive to predictive and proactive behavior.
 - o Nothing will change if none of the action-items listed are done. If something doesn't change, the future will not change.
- Cost is #1 driver and will always be. However everyone already accepts cost.

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