



Executive Roundtable:

MRO IT: Determining the First Steps toward Data Harmonization

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Modern networked aircraft generate more performance data, which makes it critical that the aviation MRO (Maintenance Repair Overhaul) industry quickly and effectively process the captured data into real time, intelligence-based maintenance planning. In addition to effectively managing and using the data, varying data formats from multiple sources, proprietary and legacy systems, historical paper records and more complicate the issue.

In order to manage the vast volumes of new aircraft data, data harmonization is critical. The information must be harmonized with an established standard and be easily accessible to all parties. Because all stakeholders (airlines, manufacturers, third-party MRO providers, aftermarket suppliers) within the MRO lifecycle and supply chain are inter-dependent, better data harmonization means fewer inventories, a more effective supply chain, and ultimately better predictive modeling and health monitoring.

The Aviation Week Executive Roundtable: MRO IT is one of several 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.

Identifying an integrated approach to determining the business case and figuring out the first steps to motivate the industry to harmonize, then share, data across the MRO value chain was the focus of a Sept. 19 Aviation Week Executive Roundtable held at the Hyatt Regency in Miami, FL. The goal of the roundtable was to reach a shared view and list actions/ideas that each person can use to prioritize the business behind data harmonization and improve data sharing across the MRO lifecycle in the next 12-18 months.

The roundtable was hosted by Bill Cavitt, VP engineering, performance and quality assurance at American Airlines, and Lee Ann Tegtmeier, managing editor, civil aviation & MRO, for Aviation Week. The meeting was sponsored by The Boeing Company.

This was the third MRO IT roundtable, and the second for the Americas region. The first Americas meeting in 2011 affirmed the need for data standardization; however industry commitment and motivation continue to be barriers in moving forward. Last year, roundtable participants agreed that safety and reliability data should be the first to be harmonized. Before doing so, however, they said a collaborative business case with a defined return on investment must be clearly presented, as well as exactly which data is willing to be shared.

Organizations participating in the Sept. 19 roundtable were ATA e-Business Program, AAR Landing Gear Services, AerData, Air Canada, Airbus, Aircraft Inventory Management & Services, AJ Walter, American Airlines, Atlas Air, CAVOK Group, Copa Airlines, Delta Air Lines, Embraer, FedEx Express, HEICO Aerospace, ICF SH&E, InfoTrust Group, JetBlue Airways, Kalitta Air, LLC, Lynden Air Cargo, Mesa Airlines, Northrop Grumman, Pratt & Whitney, Southwest Airlines, TAP Maintenance & Engineering, Technology Solutions, TIMCO Aviation Services, United Airlines, UPS Airlines, and US Airways.

Prior to the meeting, Lee Ann Tegtmeier reached out to the industry via social media to try to determine a definition of “data harmonization” for the group to work with. The proposed definition was:

Achieving data harmonization requires use of a common data syntax and a set of open, business to business transactions across the whole supply chain that improves airworthiness.

The room was polled on what they hoped to achieve during this meeting:

- Able to advance the cause -> make advancements on the business case / define ROI.
- Ability to create consistent message. Crystallize the ‘elevator message’ to proliferate via media, etc. Maybe determine a definition the industry can embrace.
- What are the next steps? And how do we can we advance on these steps?
- Near-term objectives – to achieve parts visibility both within the company and inter-company.
- Pushing ATA standards for data harmonization, and discovering why some aren’t adopting/using.

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

- 1) Determine a comprehensive business case for data harmonization.
- 2) Define the minimal, agreed-to “generic” format of safety and reliability data that stakeholders are willing to share.
- 3) Identify key motivation factors to foster industry commitment towards data standardization.

The 2012 Aviation Week MRO IT Executive Roundtable participants confirmed the need to define a mutually beneficial value statement with direct influence to all stakeholders, before a standardized business case can be designed. The first data set recommended to be shared was back-to-birth traceability for life-limited parts. The standardized data should be in the already established Spec 2000 format, stored and maintained by a designated third-party, and easily accessible in a cloud-based warehouse.

KEY FINDINGS:

- The first data set to standardize across industry is back-to-birth traceability in Spec 2000, since it is an established standard. Due to cost involvement, all stakeholders have a vested interest in this information, including induction records, maintenance reports, and past and present traceability of parts.
- A designated 3rd party should maintain a data warehouse that is cloud-based and low-cost. This 3rd party should manage security, access rules and data validation, but data quality must be maintained by each stakeholder. A4A was suggested as the potential 3rd party candidate.
- Before a comprehensive, standardized business case can be designed, a mutually-beneficial value statement with direct influence to all stakeholders must be created.
- Other value-added data sets that were highly recommended to be should be harmonized were parts pooling, work packages, SDR (Service Difficulty Report) data, AD (airworthiness directive) compliance, service bulletin completion, supplier visibility to LLP status.

- Because Spec 2000 already exists and is highly utilized by most airlines, it should be the format for shared and accessible data.
- Before building the business case, know and evaluate your current IT operating costs (systems, servers, hardware, infrastructure, etc.). Do you really have a clear picture on how much it currently costs to run your current IT systems and architecture?

Details of topical conversations in the work groups follow.

BUSINESS CASE FOR DATA HARMONIZATION

Participants consider the factors and parameters into developing a standardized business case template for all stakeholders in the MRO value chain, including cost and performance metrics, internal and external best practices on adoption, and identifying potential barriers.

What factors/parameters need to be considered for a standardized business case involving all parties in the MRO value chain?

- Mutual value - There's got to be a value statement that matters. What does it matter to me?
 - Ex. Electronic task cards; Non-routines.

What metrics are upper management looking for?

- Compliance / Mechanic Efficiency/ Dispatch reliability/ Quality Escapes.
- ROI, PB, NPV (Net Present Value) - prioritized.
- Cost drivers / Investment.
- Inventory.

What would be the dollar-value on benefits? What are benefits that may not have a cost-value to it yet?

- Although it is necessary to make the industry more efficient and productive, it cannot succeed without everyone's commitment and buy-in.
- Cannot determine because it is on individual business cases.

What are some real-world proven best practices (internal and external) on standardizing data?

- External: Banking, health care.
- Internal: ACARS, internet ticketing/kiosks.

What are the barriers from adopting these practices?

- No industry-wide priority.
- Business interest.
- Payback timeline/validation.

Brainstorm and design a standardized ROI template (short-term and long-term).

- In order to move the industry forward, the common business interest among all stakeholders must be determined and defined.
- ROI template has to be centered on individual user cases.

Pillars of the Business Case:

What's the value? Do we believe in it? Before building the business case, do we even want to get into the business?

1. Know the cost of current systems.
 - Evaluate costs of current systems, servers, hardware, infrastructure, etc.
 - Most IT budgets are divided into multiple pieces, so organizations may not have a clear picture of current cost structure. If you are running on older systems or architecture, you may be paying more than you realize.
2. Fleet transition.
 - Additional required costs in terms of adding infrastructure, people, and resources to handle more efficiently?

3. Configuration control.
 - Where are the opportunities? If configuration is threatening operational control and compliance, then the business case can be better defined to the CIO.
 - If you are really in a position where configuration is threatening operational control, and hence not compliant, then it would be stronger business case for the CIO.
4. Internal data harmonization.
 - Focus on internal data harmonization of components, as these can be tracked and proven with tangible costs/figures – understandable to CFO and M&E upper management.
 - Traditional business case arguments to CFO.
 - Delays/cancelation/reduction headcount/aircraft out of service – these have been met with more skepticism, as they are harder to pinpoint and materialize.
5. Brand damage.
 - The overall cost if an organization is out of compliance or has an incident in the market place. Financial could figure out the cost, but that’s not the way we should go about it.
 - Harder to calculate and understand more in the maintenance side.

COLLABORATIVELY DEFINING A COMMON FORMAT FOR SAFETY AND RELIABILITY DATA

Table members determined which priority data should be standardized and shared first, guidelines on how it should be formatted and maintained, potential barriers and solutions to overcome these hurdles.

What is the one piece of information to share first to build industry confidence and value?

- Mechanical delays and cancellations.
- Back to birth traceability.
 - *Who wants to know?* All stakeholders due to costs, whether at return or at lease acceptance.
 - *What do you want to know?* Induction records (date, time, maintenance progress/records). Past and present traceability of parts.
 - Component level (serialized).

Example: Life-limited Parts (LLP) - small subset of components that have small lifecycle. Utilize an established standard, such as Spec2000, for multiple benefits and varying pertinent information for individual users.

What would be the format and parameters of the information to be accessible to everyone?

- Spec2000 (current version) – already exists today, and utilized by most airlines.
- Data tags/XML – common definitions.

Who should maintain quality assurance of this data? Why? How?

- 3rd party-maintained data warehouse that is low-cost and web-based.
 - Cloud-based.
 - Security.
 - Access rules.
 - Data validation.
- 3rd party to maintain data security, integrity, etc.
- Stakeholders can pull from pool on a needed basis, but
- Each stakeholder must maintain data quality.
- Possibility A4A to be designated 3rd party and maintain data warehouse.
 - However Boeing and Airbus each have a cloud-based warehouse for their customers, so operators should utilize and maximize on these already-existing capabilities.

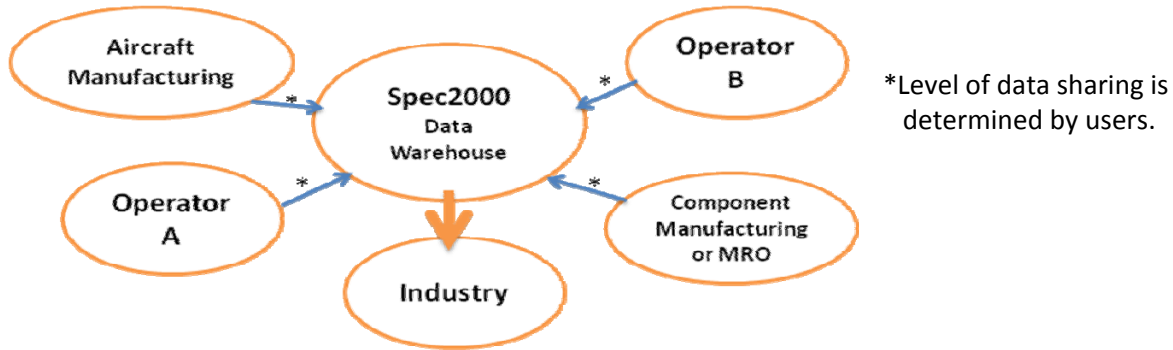
Identify potential barriers to obtaining or providing the data from the various stakeholders.

- Buy-in participation, cost.
- Understanding the value, disparate ROI (non-mutual benefit).

How could these barriers be overcome?

- Education and industry gatherings to show value.
- Understand the roadmap.
- Focus on the important data.
- Incentivize compliance.

Potential Schematic:



KEY MOTIVATION FACTORS FOR INDUSTRY COMMITMENT

By exploring proven data harmonization strategies, group participants identify strategies and metrics to motivate commitment towards industry-wide data standardization and overcome potential roadblocks, internally and externally.

Looking at internal success stories on data harmonization, what were the key motivation factors and KPI metrics?

- Ability to share data.
- Financial benefits (Even with financial benefits, will it drive the business case? No, because the value is not in data harmonization, but in harmonizing businesses.)
- Safety & operational benefits.
- Performance enhancements.
- Airworthiness – Reliability – Economics.
- Efficiency.

Examples of value-added data:

- Parts pooling, work packages.
- SDR data, AD compliance, SB completion.
- Supplier visibility to LLP status, expendable – If we were able to share with suppliers what the needs were for expendable LLPs, then suppliers would have predictive capabilities on demand (when and what products). Maybe a source of funding to share and warehouse data, and carry the momentum for other data sets.

Where are you personally committing to industry data harmonization? Why?

- Automation.

What are the roadblocks from commitment?

- Regulatory agencies’ punitive mentality - defining what will be held against operators based on their shared data.

- Lack of in-use standards and adoption of existing standards (ASD, Spec2000).
- Lack of visibility on impact of not using data standards. What's the cost of not harmonizing internally?
- Culture change management (resistance to change, doesn't matter union or not).
- Cost of technology investment (paper v. electronic) and implementation.
- Lack of knowledge –Tons of data already exist, but struggling to turn data into knowledge. Tribal/legacy knowledge interfering with implementation of new systems/methods.
- Moving decision into action – we have standards, agreements, but then execution is lost somewhere.

What are individual ways within your 'power' to overcome roadblocks?

- C-level involvement with entities that maintain standards, such ATA eBusiness Program.
- Commitment from floor and front-line mechanics. (Cost is not in the data-mining process, but in the mechanic being only 40% effective, ultimately wasted costs in parts labor and cycle time.)

What industry body should lead this cause? Why?

- A4A/ATA has a lot of work been done. But now it must be a broader reach into IATA, ICAO, ASD.

How would they take on the responsibility (funding, data integrity, infrastructure, etc.?)

- A4A is already doing this, and there's no reason to re-invent the wheel.

Actions:

- Never lose a record back to birth.
- XML schema - Use XML schema database with ASD standard to retrieve old records data as well as new aircraft without categorization.
- Simplify configuration management.

Example: Maybe a common service provider is the common point - Several carriers have task card systems; why couldn't that be provided to their common service provider and that would be our collaborative action item point? (Providing each airline's automated system to the singular service provider that all of them use)

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