The Role of Enterprise Architecture in Moving to an AIM Environment

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AIM defined as:
- Need to address all current and future needs of ATS and flight operations.
  - (Strategic, Pre-Tactical and Tactical Planning Stages)
- The basis for Collaborative Decision Making (CDM).
- Net-Centric Approach. Every system is a node in the network.

Airservices Australia AIM History
- Started planning future AIM in 2005.
- Various systems, different technologies.
- Only common entity – data / information.
- Many digital systems, but no net-centric approach.
- Where is AIM’s boundary?
- Airservices approach, 6 core information domains:
  - Air Traffic Management.
  - Air Safety.
  - Board Governance & Compliance.
  - Legislation & Regulatory Obligations.
  - Business Management & Administration.
  - External Stakeholders & Environment.
The Process So Far

1. Determine the current systems baseline.
2. Interviews to determine users perception and IM issues.
3. The result was:
   - Information Management Capability Framework.
   - Information Management Architecture Framework.
   - Information Management GAP analysis.
Key Information Management Principles

Information Management Strategic Framework

Airservices information will be managed so that it is:

• Captured once and used many times and there is a single authoritative source for all high-value operational and business critical information.
• Created, organised, used and protected in accordance with its value to the business and stakeholders.
• Fit for purpose and fit for the future, accessible and flexible to support forecasting, planning and decision-making across the business.
• Managed according to its lifecycle and independent of technology systems.
• Compliant with our legislative and regulatory responsibilities – transitioning from paper-based to electronic records.
• Leveraged, where appropriate, to create intellectual property as a commercial product for aviation industries and other customers.
The Information Management Strategic Framework

- Principles & Governance
- Policies & Architectures
- Core Capabilities
  - People, Processes & Technology
- Foundations
  - Standards & Methodologies

**Principles embedded in decision-making**
- Executive endorsement & support
- Information & data custodianship
- Information resource management KPIs included in ASA Corporate Plan and Performance Agreements

**Policies & Architecture**
- Information Management policies implemented & available for all staff
- Information Architecture & Corporate Data Model
- Metadata Framework

**Core Capabilities**
- Content, document & records management
- Search & discovery
- Collaboration
- Information interoperability and data exchange
- Creation and management of Intellectual Property
- Analytics & Reporting
- Consumer Relationship Management
- Workforce & Activity Tracking
- Governance and audit intelligence
- Technology alignment

**Foundations**
- Information Value Assessment
- Classification & Protection
- Common Business Language
- Metadata
- Corporate Data Model
- Information Architecture
- Data & Information Standards
- Data & Information Quality Frameworks
- Information Lifecycle

**Core Information Domains**

- Air Traffic Management
- Air Safety
- Board Governance & Compliance
- Legislation & Regulatory Obligations
- Business Management & Administration
- External Stakeholders & Environment
Enterprise Architecture: The analysis and documentation of an enterprise in its current and future states from a strategy, business, and technology perspective. \[ EA = S + B + T \]
• EA documents both current & future views of the enterprise
• Changes in an architecture come from 3 levels of input:
  – Executive input on strategic direction and priority
  – Business Manager input on process changes
  – Technology Manager input on supporting IT changes
The Enterprise Architecture outcomes help to:

- Achieve strategic goals that depend on IT resources.
- Improve business performance by maximizing IT efficiency.
- Support the desire of executives and managers to have strategic priorities/business requirements drive IT solutions.
- Link multiple IT networks, systems, applications, services, and databases across the entire enterprise.
- Share information between lines of business.
- Integrate several forms of applications and local/wide area networks that lacked open standards.
- Reduce duplicative IT resources across the enterprise.
- Protect data and IT assets that rely on enterprise-wide approaches.
- Maximize the effective use of limited budgets.
- Improve human capital management in IT knowledge/skill areas.
EA activities are two-fold: a **management program** and a **documentation method**, which together improve performance through the integration of strategic, business, and technology planning and decision-making.

- **As a management program**, EA provides:
  - **Resource Alignment**: Resource planning and standards determination
  - **Standardized Policy**: Resource governance and implementation
  - **Decision Support**: Financial control and configuration management
  - **Resource Oversight**: Lifecycle approach to development and management

- **As a documentation method**, EA provides:
  - **EA Approach**: A modeling framework & implementation methodology
  - **Current Architecture**: Views of as-is strategies, processes, resources
  - **Future Architecture**: Views of to-be strategies, processes, resources
  - **EA Management Plan**: To move from the current to the future EA
How? The answer is in the Enterprise Architecture.
- How do we implement this regulation?
- How do we meet this compliance requirement?
- How is this data made available to external systems?
- How do we ensure system availability?

Why? The answer is a Requirement.
- Why does this firewall exist?
- Why does this entity exist?
- What purpose does this dataflow achieve?
- Why do we perform this business process?
- Do we still need to support this application?
Management Portal will help provide answers to the following questions:

- Are key projects aligned with ASA strategy?
- Do ASA have the right balance of risk/reward?
- Are projects delivering the expected value?
- Are ASA doing the right projects?
- Are ASA spending in the right areas?
- Do ASA have the right resources?
**AI M Building Blocks**

**Preflight Route Optimisation** (Based on forecast winds)
- A. Flextracks (common route)
- B. UPRs (individual routes)
- C. UPTs (individual routes and times -4DT)

**Preflight Demand / Capacity Balancing**
(DST based on forecast airport acceptance rates)

**Central Traffic Management System – CTMS**
Ground holding etc in collaboration with airlines

**DMAN**
DST linked to AMAN – allocates departure times between AMAN landings

**A-SMGCS**
Surface surveillance - safety runway incursion prevention & optimum taxi (fuel/ emissions)

**CDTI / EFB**
Surface moving map with ADS-B traffic (SafeRoute)

**ADS-B ITP**
Access most fuel efficient levels

**RNP Departures**
Increased payload

**ATM Long-range Optimal Flow Tool (ALOFT)**
DST that allocates required times at Outer Fix early in cruise, allowing fuel efficient flight time adjustments

**AMAN (MAESTRO)**
DST that allocates required times at Feeder Fixes for optimum sequence at runway threshold

**Tailored Arrivals**
Shorter, lower noise, fuel & emissions

**Engine idle descents to hit allocated FF time**

**RNP-AR Arrivals**
Shorter, lower noise, fuel & emissions

**GBAS**
Precision landing system – leading to curved approaches & Catll, Catlll ops

**A-SMGCS**
Surface surveillance - safety (runway incursion prevention) & optimum taxi (fuel)

**CDTI / EFB**
Surface moving map with ADS-B traffic (SafeRoute)

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Enterprise Architecture Implementation

Enterprise Architecture software is available Commercially of the shelf (COTS).

**Phase I: EA Program Establishment**
- Step 1: Establish the EA Management Program and identify a Chief Architect (CA).
- Step 2: Establish the EA implementation methodology.
- Step 3: Establish EA governance and links to other management processes.
- Step 4: Develop an EA Communication Plan to gain stakeholder buy-in.

**Phase II: EA Framework & Tool Selection**
- Step 5: Select an EA documentation framework.
- Step 6: Identify EA Lines of Business/ Crosscuts and the order of their documentation.
- Step 7: Identify the EA components to be documented framework-wide.
- Step 8: Select documentation methods appropriate for the framework.
- Step 9: Select software applications/tools to support automated EA documentation.
- Step 10: Select and establish an online EA repository for documentation and analysis.

**Phase III: Documentation of the EA**
- Step 11: Evaluate existing business and technology documentation for use in the EA.
- Step 12: Document current views of existing EA components in all framework areas.
- Step 13: Develop several future business/technology operating scenarios.
- Step 14: Identify future planning assumptions for each future scenario.
- Step 15: Select software applications/tools to support automated EA documentation.
- Step 16: Select and establish an online EA repository for documentation and analysis.

**Phase IV: Use and Maintain the EA**
- Step 17: Use EA documentation for resource planning and decision-making.
- Step 19: Maintain an EA Repository and related modeling and analysis capabilities.
- Step 20: Release annual updates to the EA Management Plan.
• Using Enterprise Architecture as the underpinning of our modernisation strategy.

• Airservices Australia, FAA and the US Air Force will shortly start to develop an initial Common Information Model based on the content of Annex 15. The current AS-IS.

• We hope to mature this concept sufficiently so we can discuss it at the next AIM Global Consortium meeting planned for October 2008 in Sydney.

• Airservices will also capture its complete Communication, Navigation and Surveillance networks in our Enterprise Architecture System.