Global Information Management

AMXM

Airport Mapping picking-up SWIM

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AMDB Applications
EUROCAE / RTCA
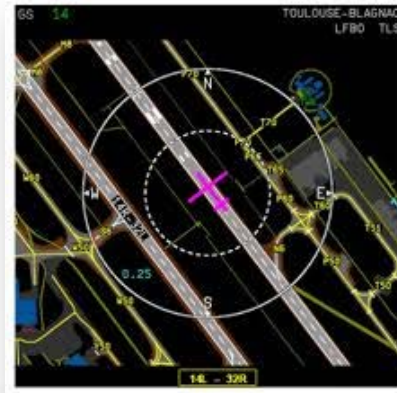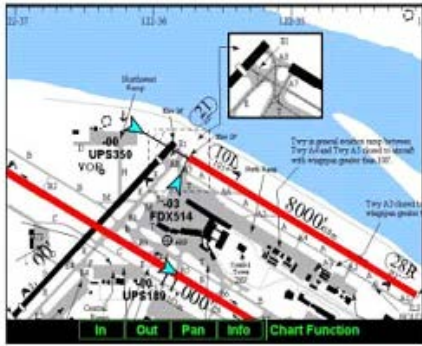
Applications:
- Moving Map
- Routing
- Runway Safety
- …

AMDB

Functions:
- Position Awareness
- Route Awareness
- Incursion Detection
- …

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Aerodrome Mapping Standards
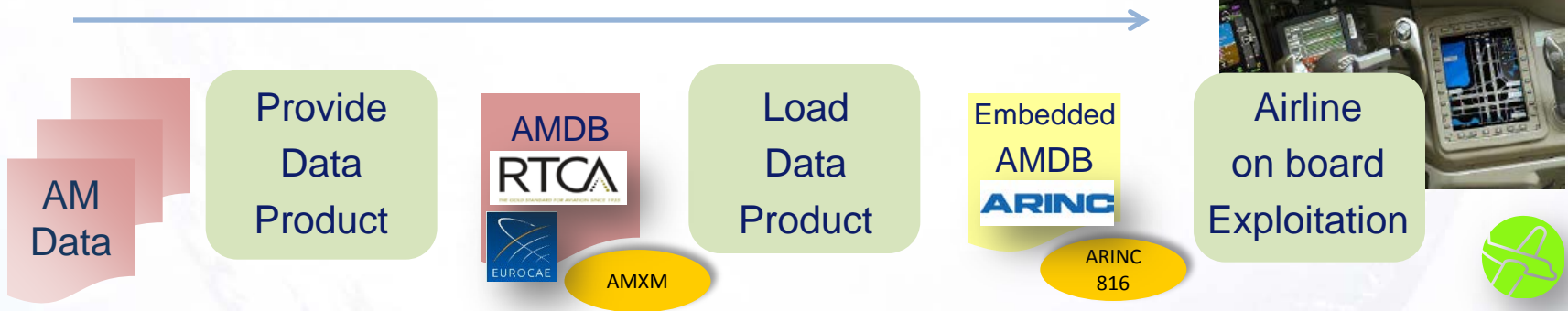
- EUROCAE WG44 / RTCA SC217
  - User requirements for aerodrome mapping information ED-99D/DO-272D
  - Interchange standards for terrain, obstacle and aerodrome mapping data ED-119C/DO-291C
- ARINC Embedded Aerodrome Database
  - ARINC816 / ARINC815
- ICAO Annex 14 & 15
- ISO19100 as standardisation framework
  - OGC implementation specifications

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ICAO Annex 14 & 15

- ICAO Annex 14: Aerodrome mapping data (AMD) as "Data collected for the purpose of compiling aerodrome mapping information."

- ICAO Annex 15: Aerodrome mapping database (AMDB) as "A collection of aerodrome mapping data organized and arranged as a structured data set."

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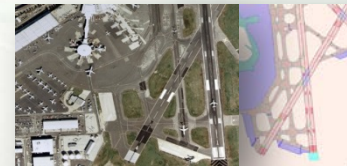
Aerodrome Mapping Standards landscape.

Air Transportation Information Exchange Conference - Global Information Management

AM Data → Provide Data Product → AMDB (RTCA, EUROCAE) AMXM → Load Data Product → Embedded AMDB (ARINC) ARINC 816 → Airline on board Exploitation

OGC — GIS, AIXM5.1, AMXM, ARINC816, ARINC815

PRODUCT SPECIFICATION — EUROCAE/RTCA ED119/DO291 | ARINC816 Embedded AMDB

EUROCAE/RTCA ED99/DO272

ICAO (Annex 14/15)
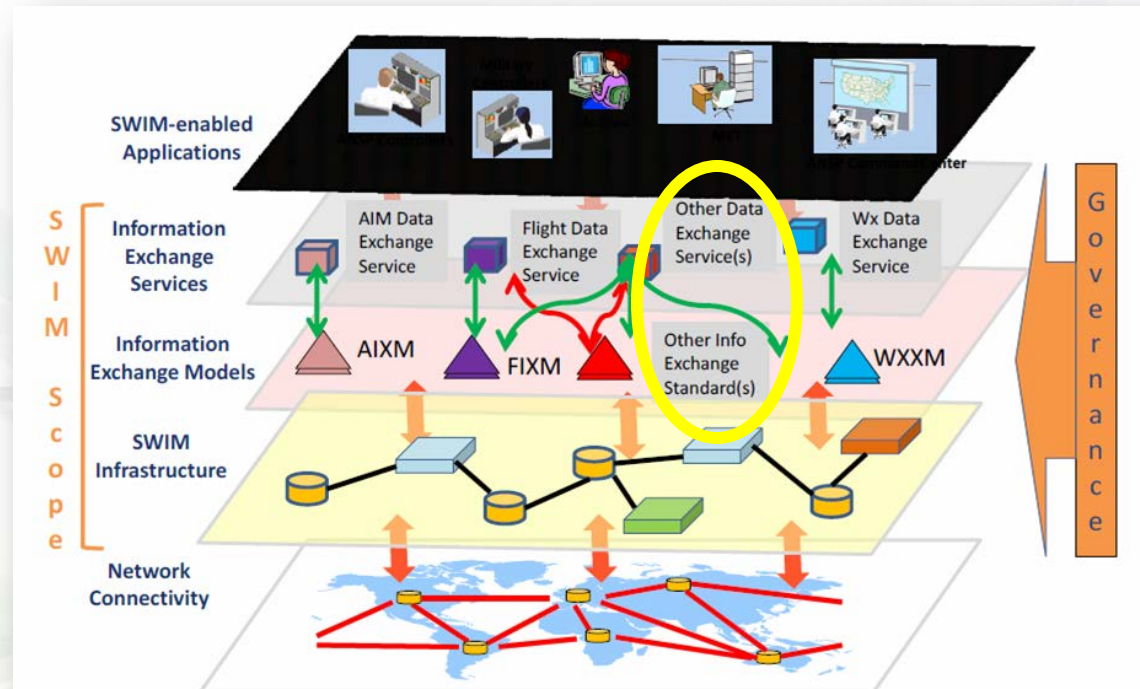
ISO19100

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AMDB SWIM provisions ED-99D / DO-272D

- Introduction to SWIM based on ICAO Doc 10039

- Example of "other"

AMDB SWIM provisions ED-99D / DO-272D

- Characteristics for AMDB information services are:
  - The ability to filter the AMDB data by feature attribute, feature location, and time validity
  - The ability to provide a graphical representation of the AMDB data

- General requirements for AMDB information service
  - Technical requirements in ED-119C / DO-291C are applicable
  - Technical elements should be available as digital means

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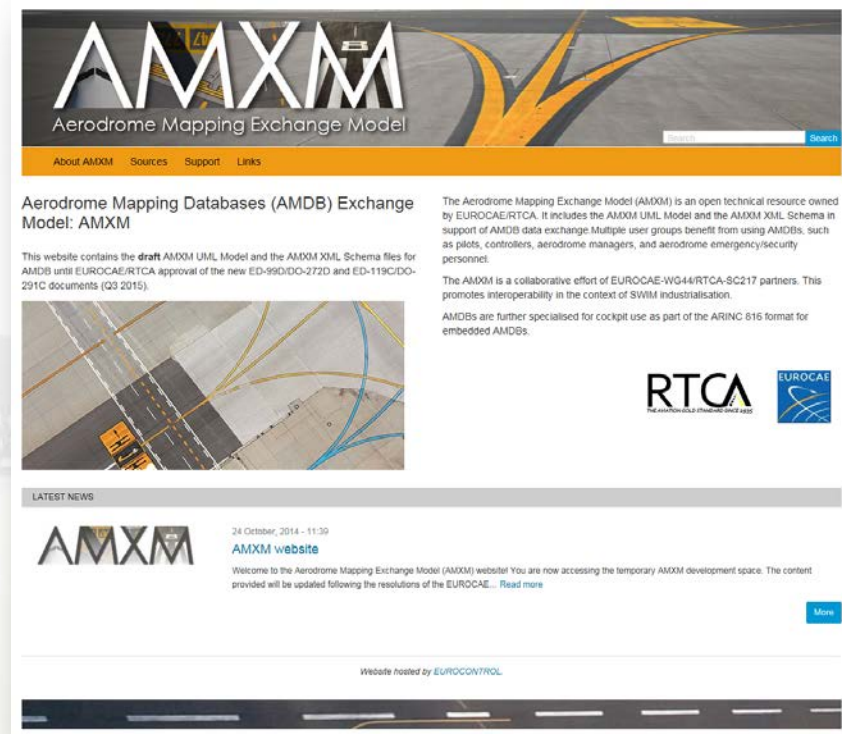EUROCONTROL

AMDB SWIM provisions ED-119C / DO-291C

- Technical SWIM Requirements for AMDB information service
    - use AMXM UML Model for message definition
    - support spatial & temporal queries
    - use ISO 19119 for service metadata
    - make Service Level Agreement available

- Recommendations
    - context dependent Non Functional Requirements
    - use a Registry to publish information
    - OGC WFS/WMS as possible means to comply

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AMXM
Aerodrome Mapping Exchange Model

- **AMXM UML Model is normative**
  - Implementation of ED-119C / DO-291C (ISO19110) feature catalogue

- **AMXM XML Schema is informative**
  - Derived from AMXM UML
  - OGC GML3.2/WFS2.0

- **Q4-2015 free download from**
  - EUROCAE webshop
  - RTCA webshop
  - www.amxm.aero

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AMXM – AIXM5.1?

- AMXM supports the requirements of the AMDB community applications
  - GIS layers as "simple" features for portrayal

- Before SWIM: AMDB UML used in the background to auto-generate the AMDB ISO19110 Feature Catalogue

- After SWIM: AMDB UML made available as the UML part of the AMXM

- AMXM XML Schema complements AIXM5.1 XML Schema
  - Data transformations enabled through SWIM standards (effect of applying SWIM)

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ICAO – AMD/AMDB Requirements

- ICAO Annex 14 sets quality provisions
- ICAO Annex 15 requires:
  - Aerodrome mapping datasets to be defined in terms of a feature catalogue and application schema
  - Datasets to contain aerodrome mapping features
  - Metadata following ISO19115
- The ED-99C,DO-272C / ED-119B,DO-291B standards may be used as means of compliance knowing that this would meet but exceed the ICAO SARPs.
- Other datasets containing AMD can be used to meet the ICAO SARPs.
  - AIXM5.1
- But complying to EUROCAE/RTCA AMDB implies additional requirements to be fulfilled (e.g. data capture and data encoding)
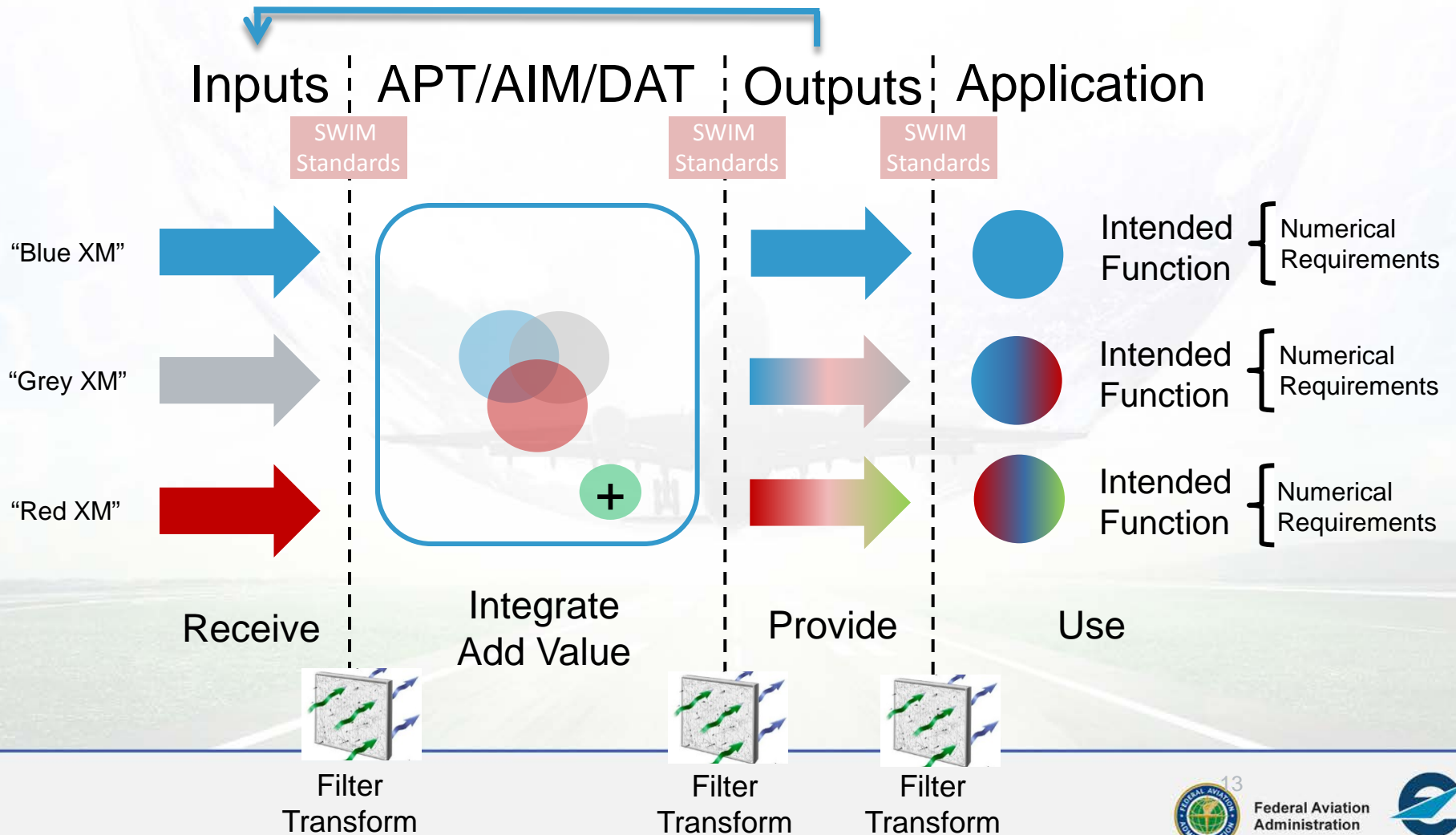
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DO-200B/ED-76A Aeronautical Data Chain
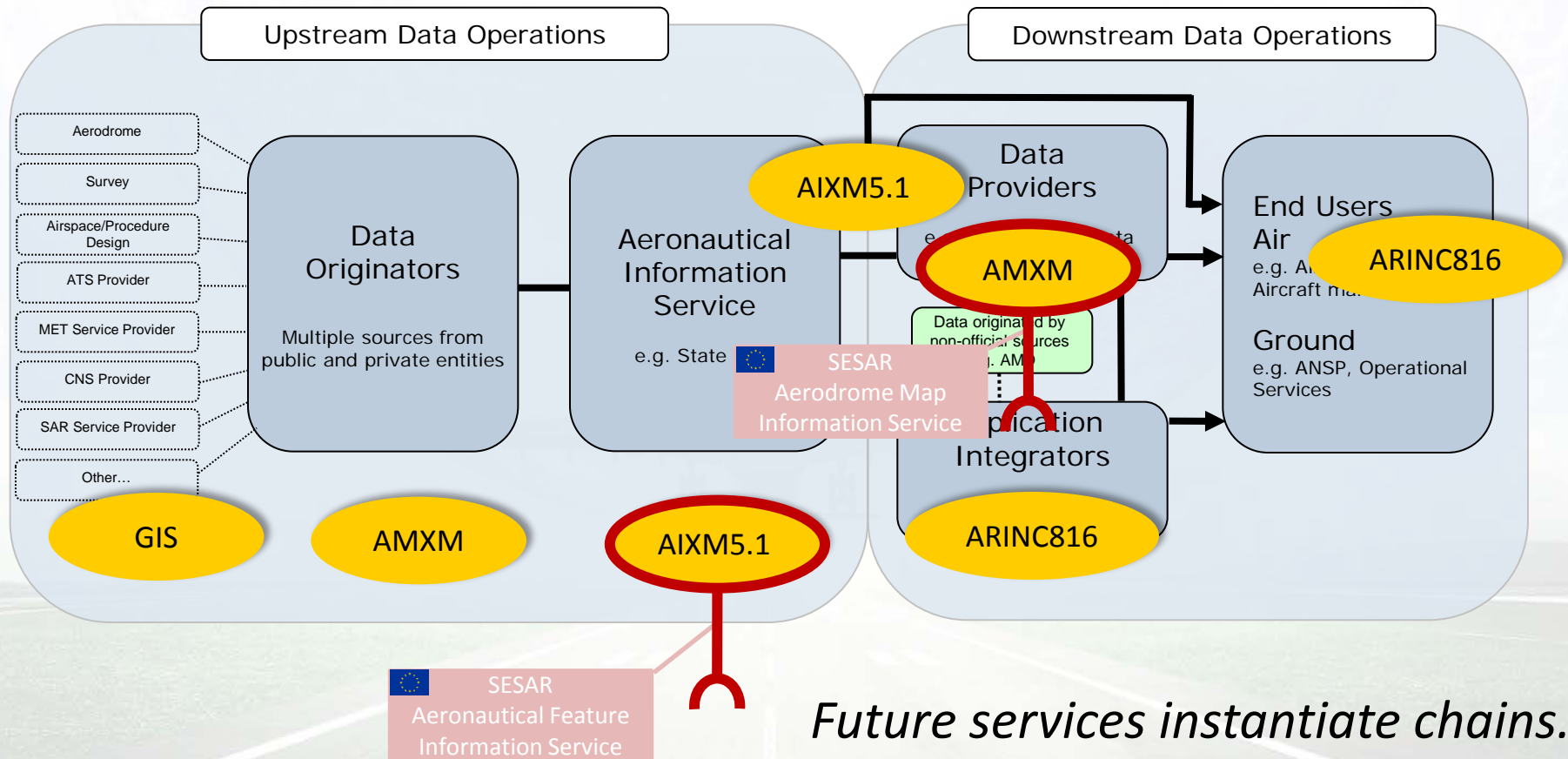
Future services instantiate chains.

Pattern

Data tailored to function & context.

Inputs | APT/AIM/DAT | Outputs | Application

SWIM Standards

"Blue XM"

"Grey XM"

"Red XM"

Intended Function — Numerical Requirements

Intended Function — Numerical Requirements

Intended Function — Numerical Requirements

Receive | Integrate Add Value | Provide | Use

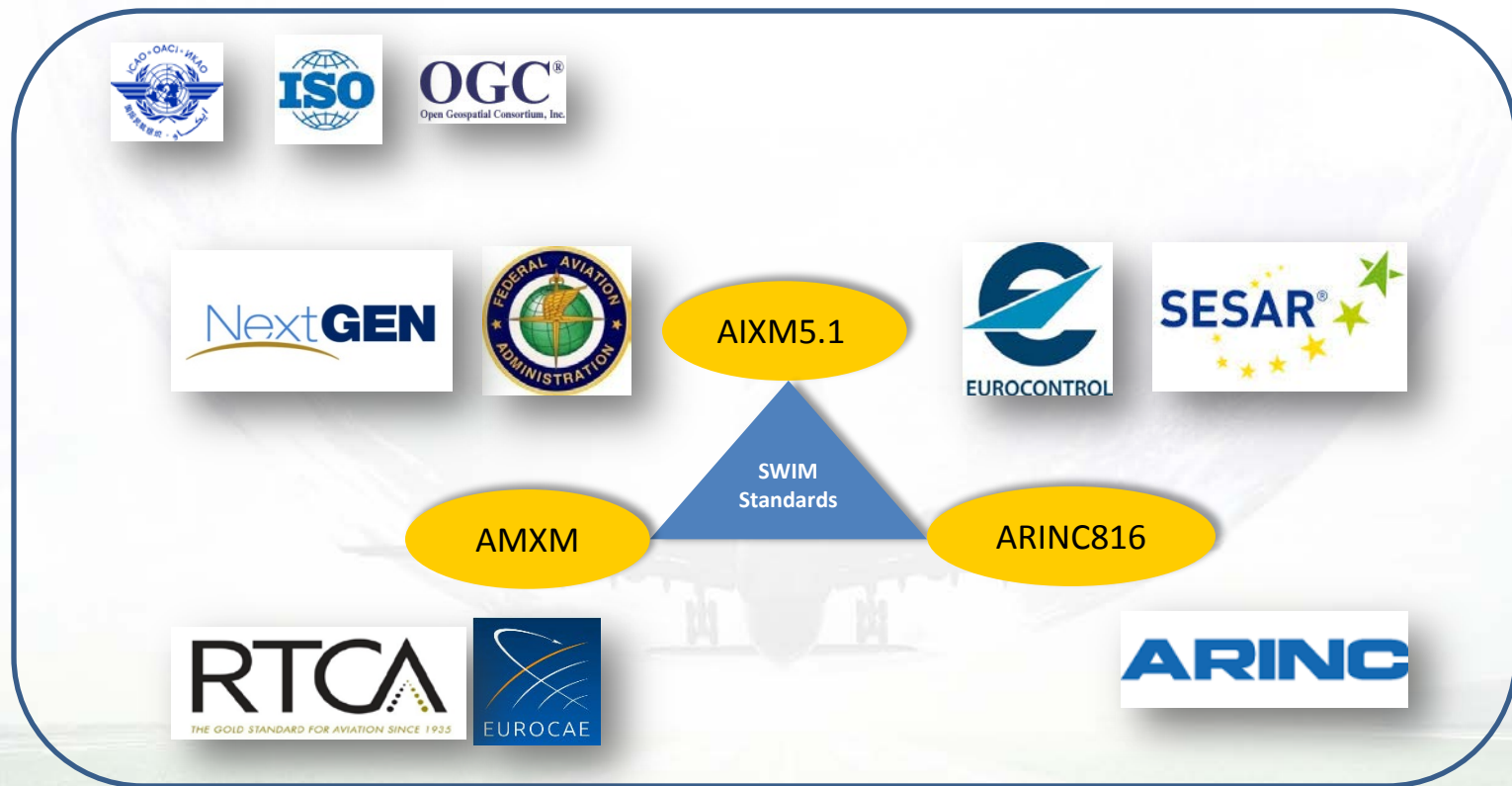Filter Transform | Filter Transform | Filter Transform

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SWIM Standards
Making & keeping it interoperable.

SES SWIM Deployment:
- Role of AIRM, SWIM Governance and Information Services

Conclusion

- AMXM is a specialized XM for AMDB
  - Expresses aerodrome map data as AMDB data product
- Steps towards SWIM taken by AMDB community under umbrella of EUROCAE/RTCA
- Outlook: aerodrome mapping data exchange between multiple airport actors over SWIM using interoperable SWIM Information Services

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Questions?

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