IMP – Architecture

Update &
ICAO AIRM Sneak Peek

Presented to: ATIEC 2016

By: Paul Bosman

Date: September 20, 2016

Aviation Information World – Forecasting the Future

Architecture Activities

Resource Naming

AIRM

SARPs Inventory

AIXM CCB

SARPs

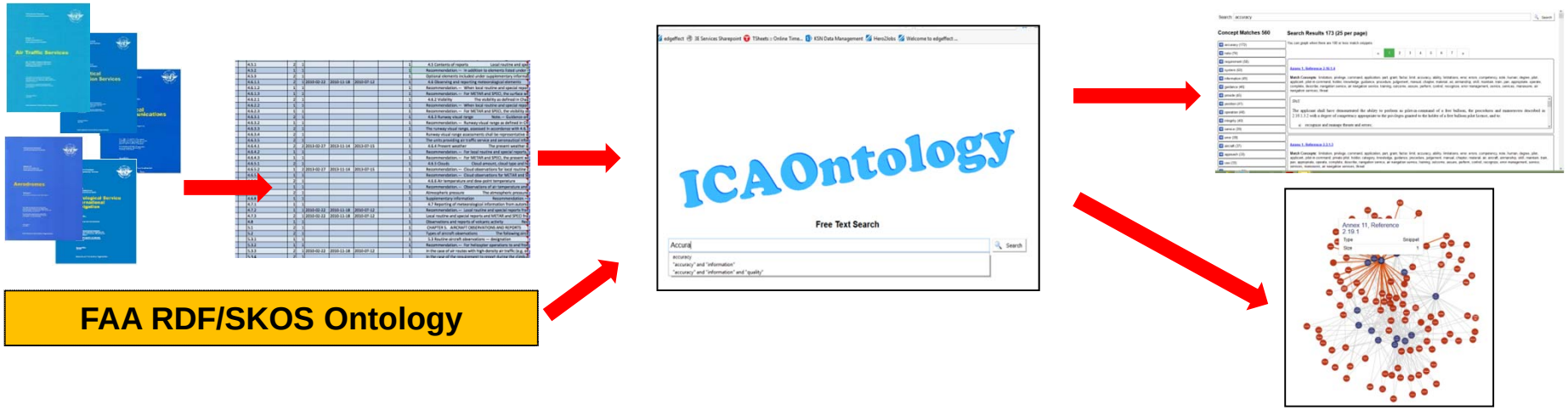
Guidance

WG Services

WG Governance

SARPs Inventory

SARPS inventory



- **Findings**
  - Many different verbs used for +- same thing
  - Suggestions for ‘ICAO – Guide to drafting of SARPs & PANS
  - First idea of all existing ‘*information service*’ related provisions
  - Ontology -> Semantic technology

AIRM

ICAO - ATM Information Reference Model

- **ICAO AIRM is not**
  - × A database
  - × An application
  - × An exchange model

- **ICAO AIRM is**
  - + Reference material (say building blocks) for all these
  - + Based on ICAO SARPs

- **Progressive build-up**
  - – Alpha – Nov 2016, Beta – Nov 2017, V1 – Nov 2018

Information Resource Naming

Do we need something like ‘urn:icao’ / … ?

- Recommendations [meta-data on the format of the data]
  - Register the XMs and their versions as MIME-types at IANA
  - Encourage the effective use meta-data on each message to indicate the format of the payload

AIXM CCB

AIXM CCB reporting

- **XMs are getting more and more popular**
- **Price of fame ☺**
- **Some reported issues**
  - AIXM specific - Vendor related interoperability
  - XM generic – Overlap / Duplication
  - Need for more business rules

Formalising XM – ICAO relationship

FIXM via ATMRPP, iWXXM via METP, AIXM via IMP

Your first port of call : XM CCB

SARPs

SWIM SARPs

Very early days !!!

Definitions = Controlled Vocabulary = Terminology

Governance

- How to publish Information Services Usage & Principles
- An ICAO registry ? General registry provisions ?

Information

- SWIM information shall be AIRM referenceable
- If/When information is exchanged via SWIM services, the information shall be exchanged via global interoperable models
- Global interoperable models shall/should adhere to following characteristics …

Services

- SWIM exchanges shall be done via information services
- Minimum list of ICAO prescribed services ?

Technical Infrastructure

- Performance based COTS / Open standards … approach
- Techno profiles at max as guidance or a XM-style industry driven approach ?

Guidance

SWIM Manual

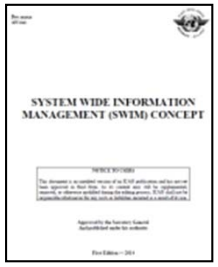
Current planned topics

- Governance/Information/Services/Technical Infrastructure

+

- Metadata/Quality
- Registries

TBD : Detailed Integration with ICAO SWIM Concept Manual 10039


SYSTEM WIDE INFORMATION MANAGEMENT (SWIM) CONCEPT

ICAO AIRM Sneak Peek

Business Requirements

- Terms
- SARPS
- PANS
- Guidance

Free text, diagrams

ICAO AIRM

Structured, addressable, unified

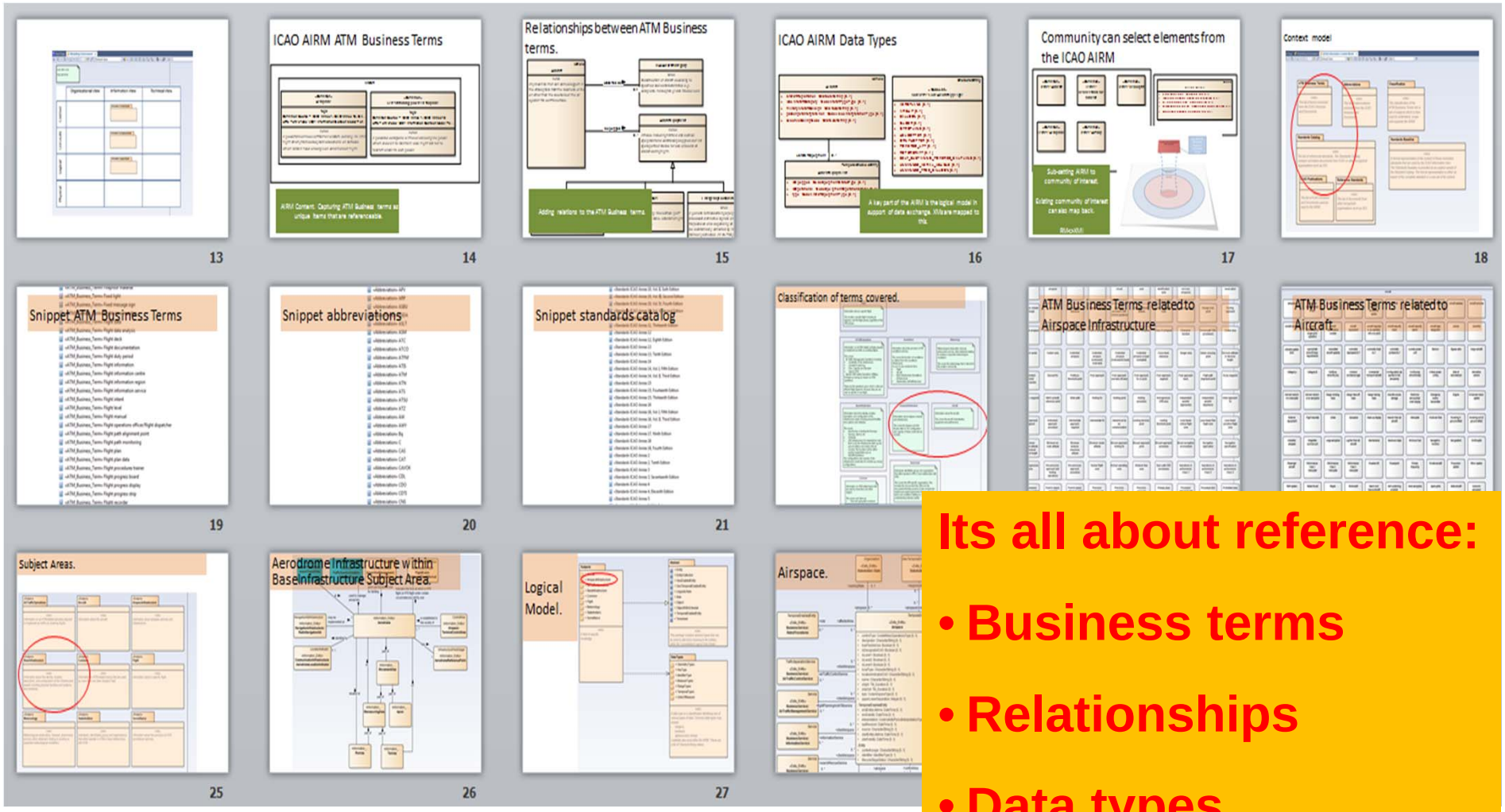
Publications

Technical Artefacts

- Data Dictionary
- Data Catalogues
- Information Exchange Models

Integrated

And here it is !!!



Its all about reference:

- **Business terms**
- **Relationships**
- **Data types**

Auto-generated re-representation of AIRM content for easy non UML use, (e.g. web)

AIRM

file:///C:/Work/IMPanel/tasks/WG_Architecture/13_airm/sneak_peek/v0.0.1/tools/output/htr

Aircraft

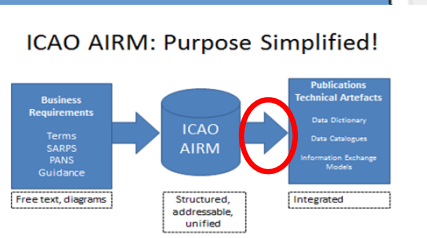
Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

Source: ICAO Annex 1;
Status: Approved
Abbreviations: ACFT
urn: urn:x-icao:airm:v001:Information Context Model:Terms:Aircraft

Aircraft - category

Classification of aircraft according to specified basic charac
aeroplane, helicopter, glider, free balloon.

Source: ICAO Annex 1;
Status: Approved
urn: urn:x-icao:airm:v001:Information Context Model:Terms:Aircraft - category



Glossary auto-generated from ICAO AIRM

Glossary

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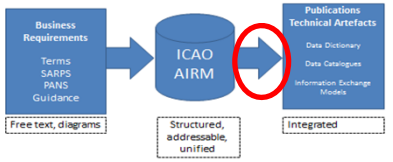
Search

Aircraft	Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.	Aircraft
Aircraft intent	Information on planned future aircraft behaviour, which can be obtained from the aircraft systems (avionics). It is associated with the commanded trajectory and will enhance airborne functions. The aircraft intent data correspond either to aircraft trajectory data that directly relate to the future aircraft trajectory as programmed inside the avionics, or the aircraft control parameters as managed by the automatic flight control system. These aircraft control parameters could either be entered by the flight crew or automatically derived by the flight management system.	Aircraft intent
Trajectory or profile	This is a description of the movement of an aircraft, both in the air and on the ground, including position, time and, at least via calculation, speed and acceleration.	Trajectory or profile

ICAO AIRM: Purpose Simplified!



Data Catalogue auto-generated from ICAO AIRM

Data Catalogue

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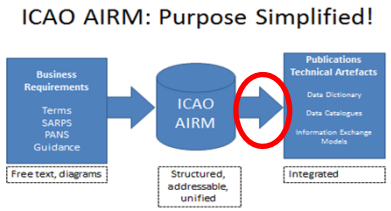
Name	Defintion	Link
Aircraft	Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.	Aircraft
Attributes		
aircraftRegistration	CharacterString	A unique, a identifies a the Aircraft Nationality or Common Mark and an additional alphanumeric string assigned by the state of registry or common mark registering authority.
icaoAircraftCategory	CodeAircraftTypeType	Classification of aircraft according to specified basic characteristics, e.g. aeroplane, helicopter, glider, free balloon.
militaryAircraftCallsign	CharacterString	The aircraft callsign for a military aircraft.
passengersInterpretation	CodeValueInterpretationType	Indicates whether the Aircraft Characteristic concerns aircraft with larger or smaller number of passengers.
selectiveCallingCode	CharacterString	SELCAL code, for aircraft so equipped.



Benefits

<u>The IMP promise</u> : Information exchange design providing interoperable, consistent and reliable data leading to a positive effect on safety and cost effectiveness

<u>How</u>

- More consistent **<u>formalised expression</u>** of IM related ICAO concepts, SARPs and Guidance
- Provide **<u>unified/harmonised content</u>** to unambiguously refer to & re-use
- Enabling system architects and developers to **<u>build system/service solutions in a more cost-effective fashion</u>**
- Seamless ATM information **<u>interoperability, quality & reliability</u>**
- Allow for **<u>further evolution of exchange models</u>** in a more consistent and non-ambiguous way

Conclusions

- **ICAO Information Architecture is now happening**
- **ICAO SWIM SARPS, Manual & AIRM considered ambitious yet realistic**
- **All support welcomed !**

ICAO plans for SWIM standards by 2018

Air Traffic Management .net

Posted on September 13, 2016

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ATC Global 2016 The International Civil Aviation Organisation (ICAO) is working to develop global standards for system wide information management (SWIM) governance standards and architectural performance by 2018, said ICAO secretary general Dr Liu Fang in a keynote opening address to the conference at ATC Global.

http://www.icao.int/airnavigation/IMP/Pages/default.aspx

paul.bosman@eurocontrol.int