

unity, solidarity, universality

# 4<sup>th</sup> UIC RailTopoModel and railML<sup>®</sup> Conference

Towards to International Railway Standards of Infrastructure Topology Model and Data Exchange Format

UIC HQ, Paris April 28th/29th, 2015





## **Overview of EUROCONTROL**



Hubert LEPORI EUROCONTROL ATM/RDS/IM 28-Apr-2015 WHO ARE WE?

# **EUROCONTROL – Member States**





# WHAT DO WE DO?

# We build the Single European Sky!





Provide **air traffic services** in the upper airspace of Belgium, Luxembourg, the Netherlands and the north west of Germany



Manage the Pan-European Network





Draft regulations





Collect Route charges

> **Civil-military** Aviation **Coordination**







# Standardisation of Air Traffic Management (ATM) Information Exchanges



Hubert LEPORI EUROCONTROL ATM/RDS/IM 28-Apr-2015



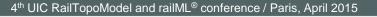
# The need for sharing ATM information

# **Sharing Information**

### a Key enabler for

### planning – executing - analysis

| YEARS   | 6 MONTH          | IS                  | DA  | YS H | HOURS | 5 N                                   | INUTES |                 |
|---|------------------|---------------------|---|------|-------|---------------------------------------|--------|-----------------|
| Business<br>Development   |                  | Pla                 | nning                                       |      |       | Execution                             |        |                 |
| <ul><li>Forecasts</li><li>Airline Plans</li></ul>                                   | Negoti<br>• Scho | ation on:<br>edules | Plan refine<br>• Arrival c                  |      | •     | Local capacity m<br>Traffic balancing | Ac     | ctical<br>tions |
| <ul> <li>Schedule Dev</li> <li>Military Exercision</li> <li>Major Events</li> </ul> |                  | -                   | <ul><li>Departure</li><li>Weather</li></ul> | •    | -     | Real time synchr<br>Tactical De-Confl |        |                 |
| Airspace Desig  | gn               |                     |   |      |       | -                                     |        |                 |



### **Data in ATM - Example**



E) NDB HB U/S DUE WIP. IAP NDB(L)DME RWY 04 AND LLZ/DME NDB(L) RWY 22 ARE TEMP WITHDRAWN, ACFT WILL BE RADAR VECTORED TO ILS APCH RWY 22 OR LOC/DME RWY 04 OR VISUAL FINAL. IN THE EVENT OF A MISSED APCH ON EITHER RWY, CLIMB STRAIGHT AHEAD TO 3000FT ONH OR AS INSTRUCTED BY RADAR. IN THE EVENT OF BELFAST RADAR BEING UNAVAILABLE, ALDERGROVE RADAR WILL VECTOR ACFT TO LOC RWY 04 SUBJECT TO WORKLOAD. AS PER ALTERNATIVE PUBLISHED APCH PROC, ACFT MAY WHEN APPROVED, SELF POSITION TO FINALS RWY 22/04 VIA DME ARC, ROUTEING TOWARDS VOR BEL FM EITHER NELBO, RINGA OR NEVRI UNTIL INTERCEPTING THE DME ARC. ACFT JOINING VIA BLACA SHOULD CONTINUE ON TRACK MAGEE THEN LEAVE MAGEE TRACK 255 AND ESTABLISH ON THE RWY 22 LOC AT DME 11.5 I-BFH, THEN AS DIRECTED. FOR RWY 04 AFTER PASSING MAGEE ESTABLISH ON THE DME 11 ARC RWY 04 HB ODM022 CAN BE SUBSTITUTED BY BEL DME 15.5. RWY 22 HB ODM245 CAN BE SUBSTITUTED BY BEL R085. MISSED APPROACH RWY 22:- CLIMB TO 3000FT, INITIALLY STRAIGHT AHEAD TO 3000FT OR I-BFH D9, WHICHEVER IS EARLIER, THEN LEFT TURN ON TRACK 005 TO INTERCEPT ON BEL R075 OUTBOUND TO MAGEE, OR AS INSTRUCTED. MISSED APPROACH RWY 04:- CLIMB TO 3000FT INITIALLY STRAIGHT AHEAD TO INTERCEPT AND ESTABLISH ON THE BEL R075 OUTBOUND TO MAGEE, OR AS INSTRUCTED. THESE INSTRUCTIONS SHALL ALSO APPLY IN THE EVENT OF A RTF DURING A MISSED APCH. THEREAFTER COMPLY WITH STANDARD RTF PROCEDURE. FROM: 29 MAY 2009 11:05 TO: 31 OCT 2009 21:30 A1656/09

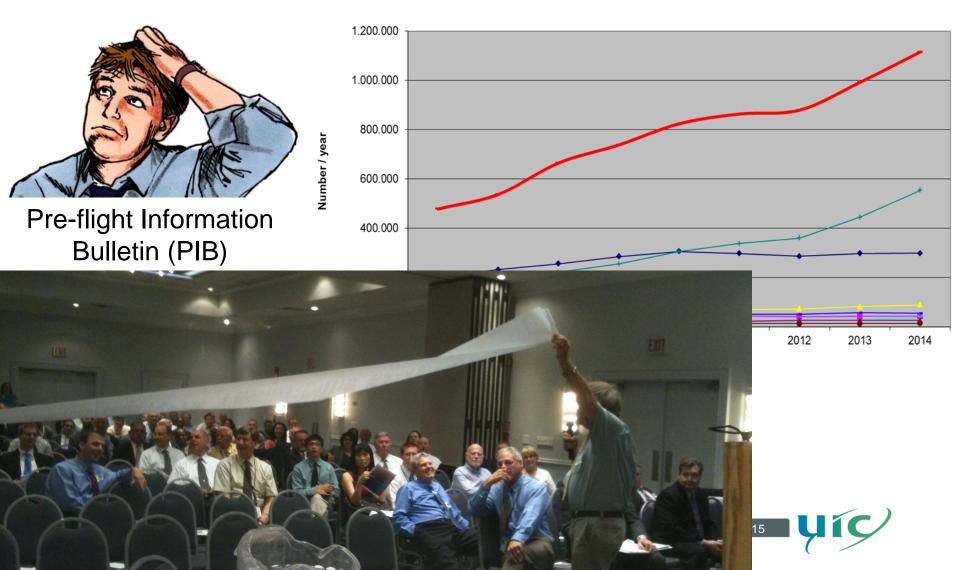


# Usage of data in ATM

#### International NOTAM Trends (source EAD)



(International) NOTAM Trends



## Usage of data in ATM





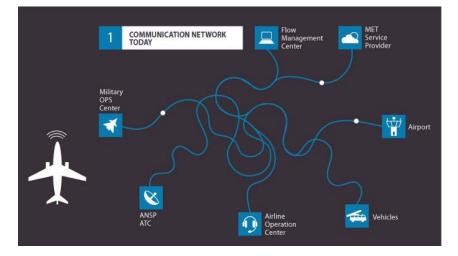
# ... as a drunken man uses lamp-posts

# ...for support rather than illumination

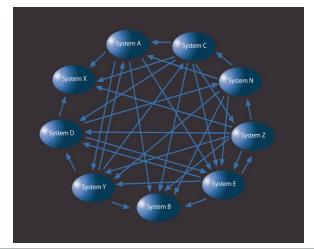




# Today's ATM Information System...



Point to point connections Partial visions Duplications (... and gaps) Multiple dedicated interfaces Multiple specific technical solutions



Potential high costs Limited inter-operability Limited flexibility

4th UIC RailTopoModel and railML® conference / Paris, April 2015



# The solution: SWIM



Doc 10039 AN/511



#### MANUAL ON SYSTEM WIDE INFORMATION MANAGEMENT (SWIM) CONCEPT

Definition : "SWIM consists of standards, infrastructure & governance enabling the management of ATM information and its exchange between qualified parties via interoperable services."

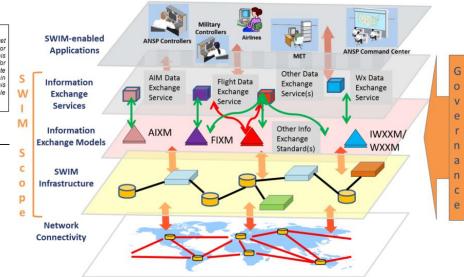


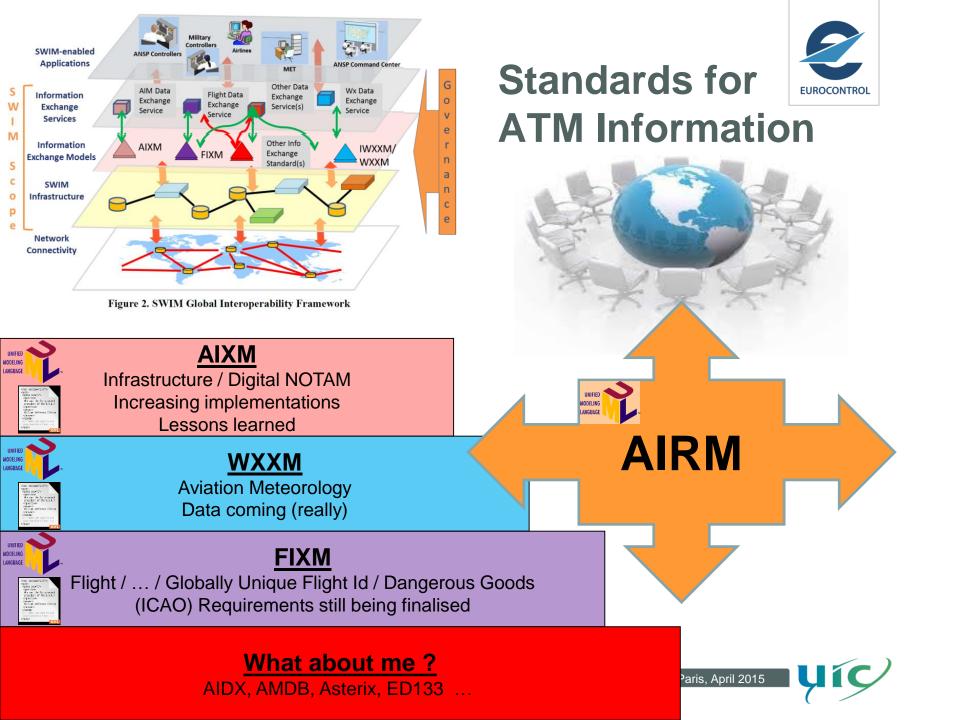
Figure 2. SWIM Global Interoperability Framework

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Disclaim

Advanced edition (unedited)

oril 2015



## Governance



#### No WXXM CCB • FAA / EUROCONTROL

### IWXXM

Managed directly by ICAO / WMO



#### AIXM Change Management Charter

Article 1 - Objective

- The evolution of the Aeronautical Information Exchange Model (ADM) shall be managed in the inferent of the largest number of ADM statisticitors ("Statisticitors)". A Change Control Bard ("COS") with International astronomous therefore established, in relation with a Change Control Advisory Bard ("COAP), both acting under the provision of this Change Management Charler ("Charler).
- The objective of this Charter is to support the aeronautical information needs of the AXM user community and of the larger aviation community through a disciplined, inclusive, and transparent approach to developing and approving new AXMI versions.
- The evolution of the AIXM shall be aligned with the evolution of other ATM information domain models (WXXM, FIXM) and with global ATM information reference model developments<sup>1</sup>.

#### Article 2 - The Change Control Board ("CCB")

Such as the SESAR AIRM and NewGEN OV-7 models

- 2.1. Tasks 2.1.1 The CCB is the main body that decides on the evolution of the ADM.
- 2.1.2. The CC8
  - schedules the publication of new versions and gives a final approval to the set of changes to be included in new versions,
     ensures the transparency of the change management process for all Stakeholders;
  - c) ensures the possibility to contribute in the change management process for a Statisticiders;
    d) is responsible for the AIXM maintenance and evolution, which includes both the model an the associated documentation (i.e. Temporality Concert LIM) to VED. Concertation, Statistical documentation, and Temporality Concert.
  - memory and uncommutative (e.g., remportantly Concept, UML, to AbU Conversion, Business Rules, etc.);
     may also issue and/or endorse implementation guidelines for new ADM versions, such as:
     a list of new operational (data encoding) caeabilities that are supported to a new
  - (i) a list of new operational (abla encoding) capabilise that are supported by a new ADM version. Thus enabling statemoders to lake informed decisions on their need to migrate an existing system to the new version; (ii) a proposed implementation limitine, thus facilitating the synchronication between the different system upgrades, which is necessary for presening the interoperability of the interoperability.
  - (ii) mapping guidelines between previous versions and the new version, in particular when changes in the model result in a complete restructuring of a concept, (v) sample data sets.

AIXM CCB:

Fully inclusive

(Mostly) industries

4<sup>th</sup> UIC RailTop



|               |       | 1    |            |
|---------------|-------|------|------------|
| Flight Inform | ation | Excl | ange Model |

#### FIXM Change Management Charter

The Fight Information Exchange Model (FIXI) is an anchange model captoring Fight and Fixe information that a globally association. The respective file Vision information for a mismostand Cold analysis of Parel (LMMPP), was endowed at the 12th An ImageInto Coldensets as that of the Analom tem Bolt Lighter Robinson for a Coldenset Device Coldenset (FICC). The second second second second second Device Coldenset (FICC) and the mismic of and the Coldenset of the Device Coldenset (FICC).

A formal change management process is required in order to ensure that the content and design of PXNM is unambiguously understood and endorsed by the PXM stakeholders. This charter formalizes the PXM governance and its operating procedures.

### FIXM CCB:

- (Ultimately) inclusive
   EUROCONTROL
- Air Navigation service providers, IATA, FAA / EUROCONTROL,...



### AIRM



#### Executive Summary The development of the ATM involves the processing of information requirement from multiple communities and the subsequent definition of informationals emission. This involves multiple statement offers.

requirements and views of all stakeholders are taken into account. It also describes how the AIRM Governance Procedures can be updated

#### AIRM CCB:

- Ops projects, Airspace Users, Enterprise Architects, System
  - / Service projects
- Up and running before the start of main technical work.

April 2015

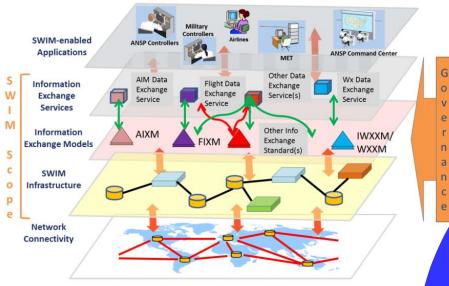
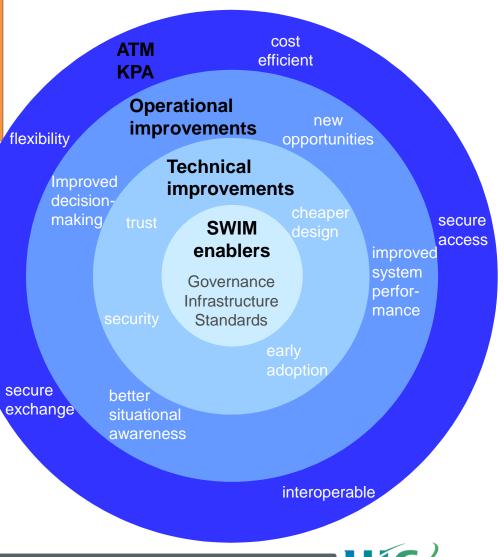


Figure 2. SWIM Global Interoperability Framework

## **SWIM Benefits**

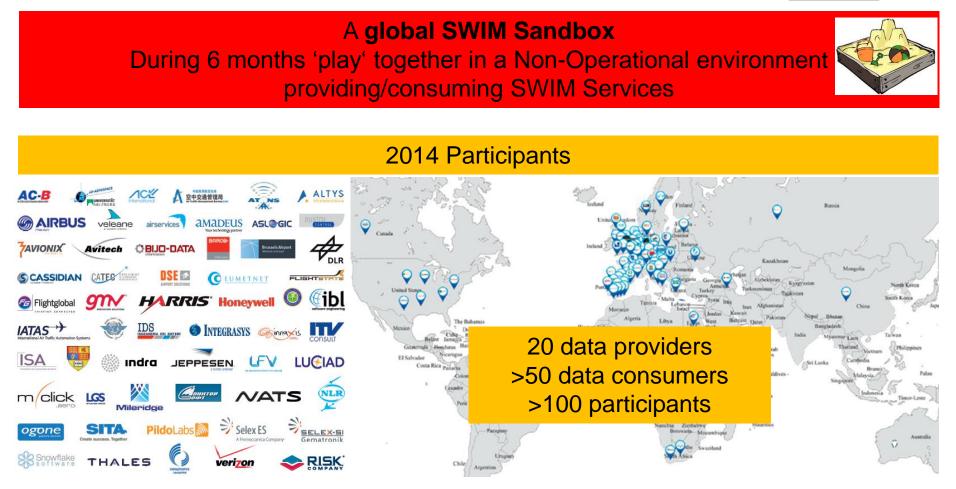




# SWIM IN PRACTICE TODAY

# **The SWIM Master Class**





Aeronautical, Meteorological, Flight,
 Environmental, Surveillance, Aircraft, ... services
 All in registry

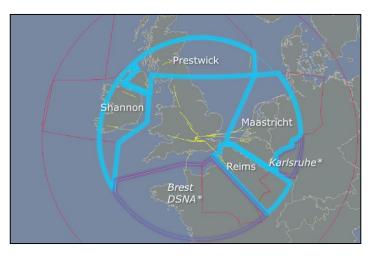


# A success story: Extended Arrival Management



#### SWIM Master Class 2013

- Sharing of delay information via a web based service with Air Navigation Service Providers
- Open web based architecture



#### Next steps (2015?)

 New trials with regards to operational changes for ATCO and supervisory staff



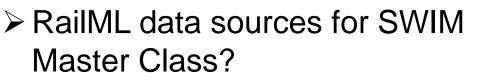
### XMAN London Heathrow Trial 2014

 Cooperation and support of Reims, Shannon, Prestwick, London and Maastricht ATC centres.

### Benefits (/year!):

- 33.5 M€ fuel saving
- 32.000 ton of CO2 reduction

# SWIM Master Class 2015



Interested in accessing Want to join the SWIM Master

Class 2015 as provider

consumer | observer?

#### Programme

10 April – 15 June 2015 **Call for participation** 

Page 20

- 23 June 2015 SESAR SWIM Master Class Launch event
- 1 July 30 October 2015 **Open competition:** Develop your SWIM compliant service or application
- 10 December 2015 SESAR SWIM best-in-class awards ceremony

4<sup>th</sup> UIC RailTopoM



### SESAR SWIM MASTER CLASS



**Towards Global Demonstrations** 

#### Take up the challenge and become SWIM Best in Class for 2015

#### Looking for

- Developers of SWIM-enabled ATM applications
- Developers of SWIM-enabled ATM information services
- Providers of SWIM infrastructures or services

Compete for the Best in Class award with your innovative SWIM-enabled solution, Or

Simply participate to discover state-of-the-art SWIM.

By joining the SESAR SWIM Master Class, you will enjoy privileged access to our unique SWIM development community bringing together SWIM infrastructure, services, practical examples, training as well as a growing network of SWIM experts from across the globe.

#### That's not all!

Beyond the challenge, your participation to the SESAR SWIM Master Class opens the door to the SWIM Global Demonstrations in June 2016.

"Selex ES has participated in the SWIM Master Class since its first edition. We consider it a unique opportunity to promote our efforts on SWIM and discover opportunities to collaborate with other participants." Dario Di Crescenzo, Programme Manager, Selex ES.

"SESAR SWIM Master Class 2014 has been a great avenue for FlightAware to collaborate with SWIM providers, developers, and consumers to create innovati ATM solutions

Daniel Baker, Chief Executive Officer, FlightAware.

#### Programme

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10 December 2015 SESAR SWIM best-in-class awards ceremony

Join the SESAR SWIM Master Class 2015 Find out more at www.sesarju.eu/masterclass or contact us at swim@sesarju.eu

Apply now!

### **Questions & Contact Information**

#### > EUROCONTROL

https://www.eurocontrol.int/

https://www.eurocontrol.int/atm-architecture-information-management

#### > SWIM

http://www.sesarju.eu/swim

#### > SWIM Master Class 2015

www.sesarju.eu/masterclass swim@sesarju.eu

#### > Governing Standards

AIRM – ATM Information Reference Model

#### > Information Exchange Standards

<u>AIXM - Aeronautical Information Exchange Model</u> <u>WXXM – Weather Information Exchange Model</u> <u>FIXM - Flight Information Exchange Model</u>



#### Contact us!



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SWIM Master Class

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- <u>scott.wilson@eurocontrol.int</u> [AIRM]
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### Thank you for your kind attention

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