AIM – Challenges and Solutions

The MET Perspective

Dennis HART

The MET Challenge

=

Air Transport Challenge


EGYPTAIR


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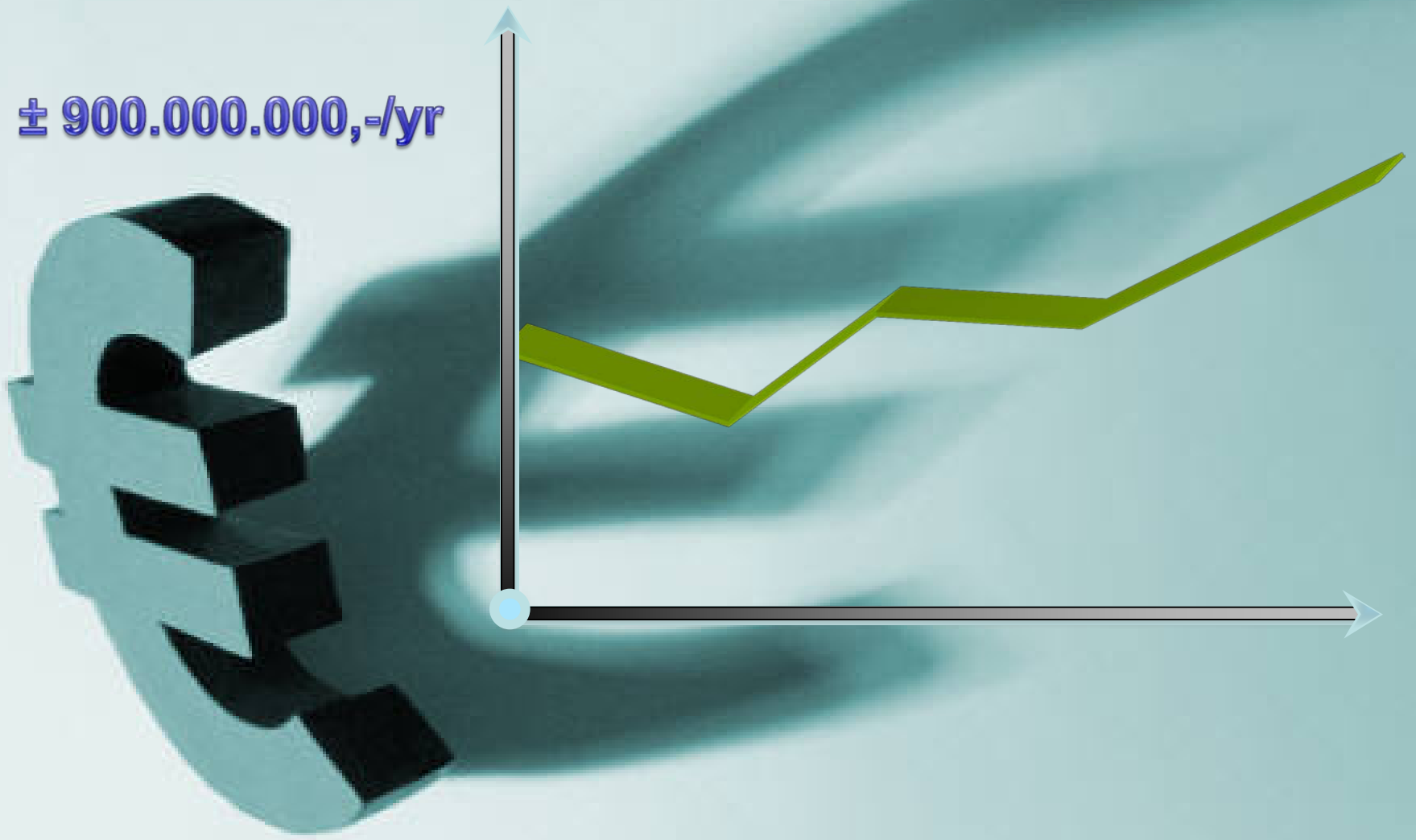
We cannot change the weather


Departures
More than 20%
of the airport delays in Europe
WX related
15% of the en-route
ATFM delays in Europe
WX related
US NTSB: over 20% of the
aviation accidents WX related
Boeing survey – the
highest training concern

Today's Impact in EUR; the bottom line

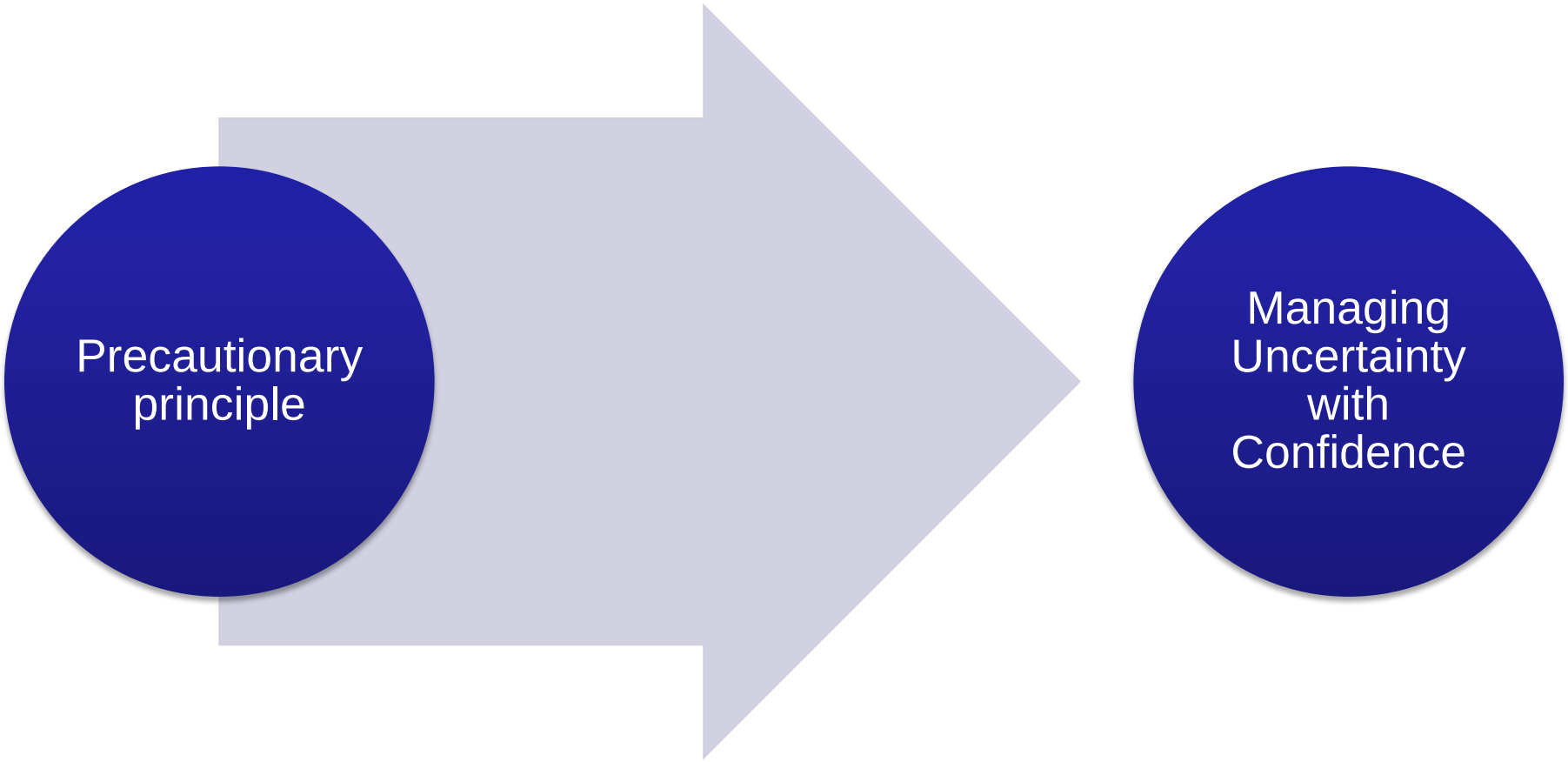
± 900.000.000,-/yr



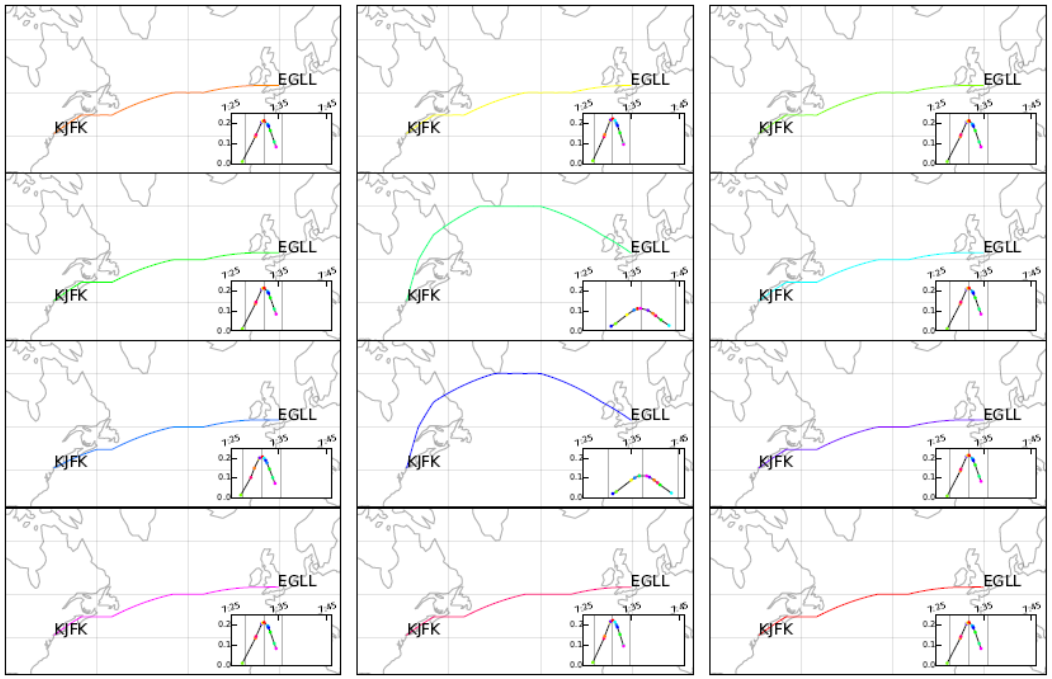
…think like Voltaire

“Uncertainty is an uncomfortable position. But certainty is an absurd one”

- Voltaire


Precautionary principle
Managing Uncertainty with Confidence

Example
Probabilistic Trajectory Prediction SESAR WP11.1 / WP-E



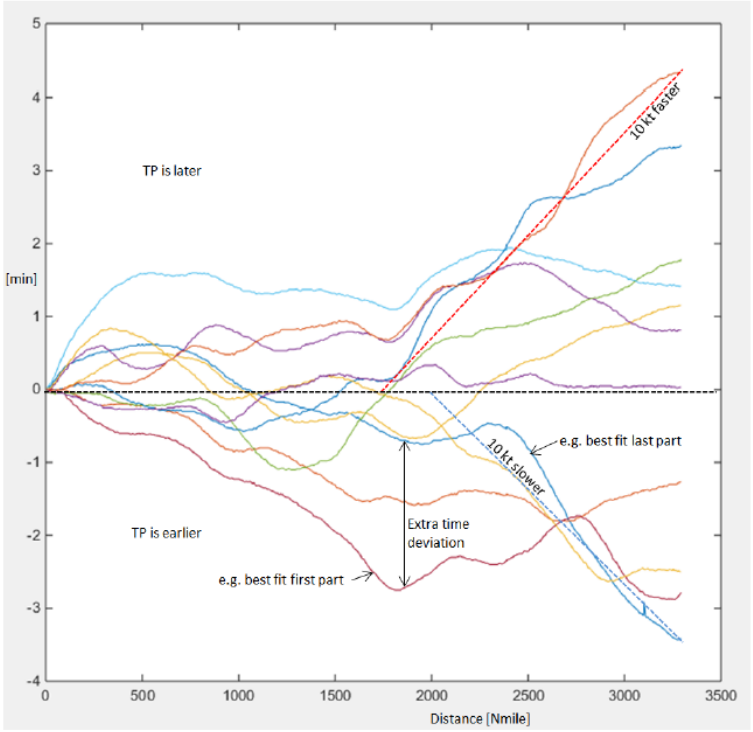


Figure 14: Flight time deviations from the deterministic member of the ensemble MET along route b (see Figure 3) and departing at t+27 (see Figure 4). Each line represents the TP result of a different member of the MET ensemble.

Enables improved knowledge based decision making, e.g.:

- Trajectory uncertainty (thus cost) is visible
- Cost index could use these (flight time) uncertainties
- Balancing flight time adherence vs total cost

Sources: SESAR WP E.02.40 Draft D2.2

From conceptual approach into (short-term) reality

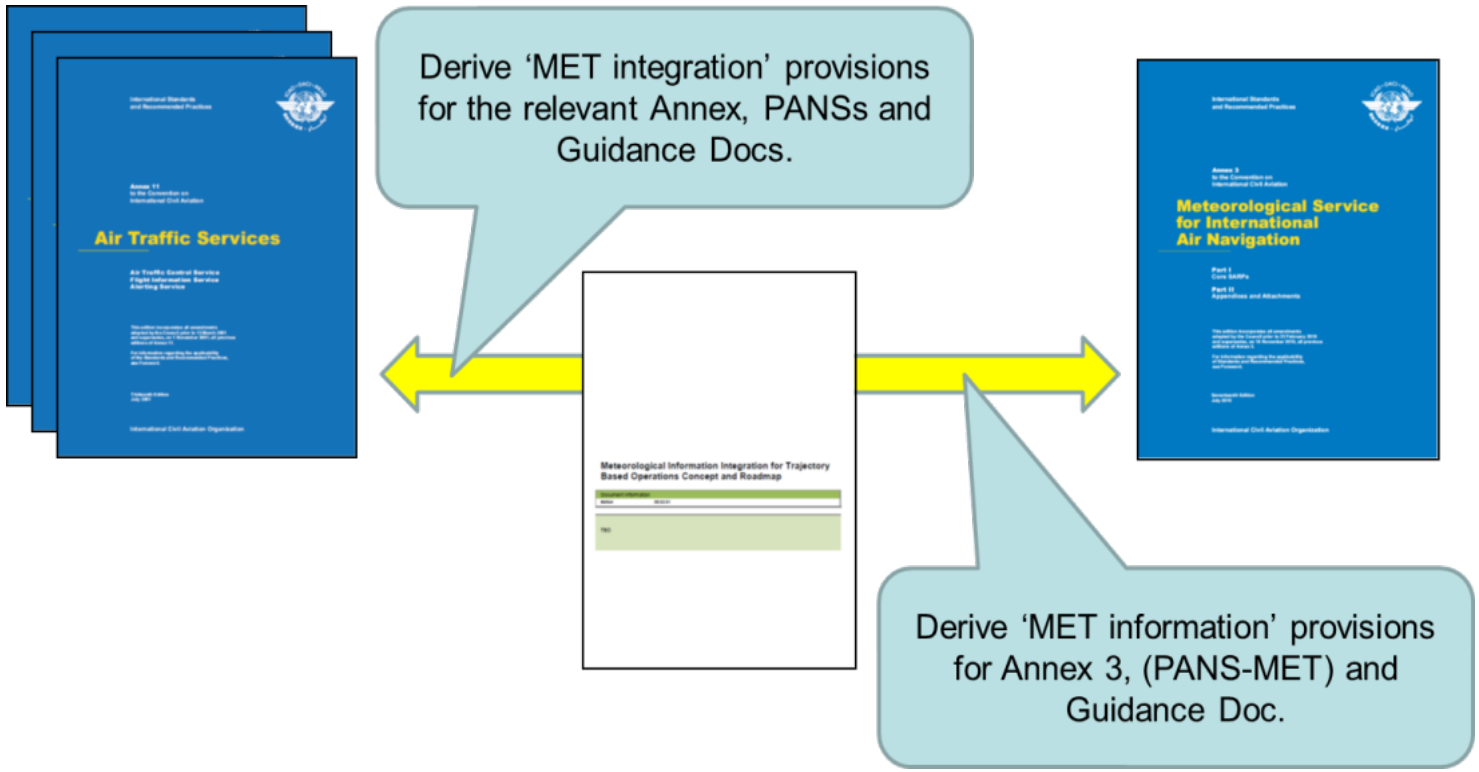
- 3-tier approach:
  - Evolving and new requirements for MET information
  - Evolution towards SWIM
  - Evolution of how services are delivered

Evolving/new requirements for MET information (1)

- Various R&D projects around the globe including CARATS, NextGen and SESAR designing, developing and validating new services
- Reflected at the level of ICAO in GANP and ASBU (AMET-Modules)
- MET Panel together with other Panels are working on the details

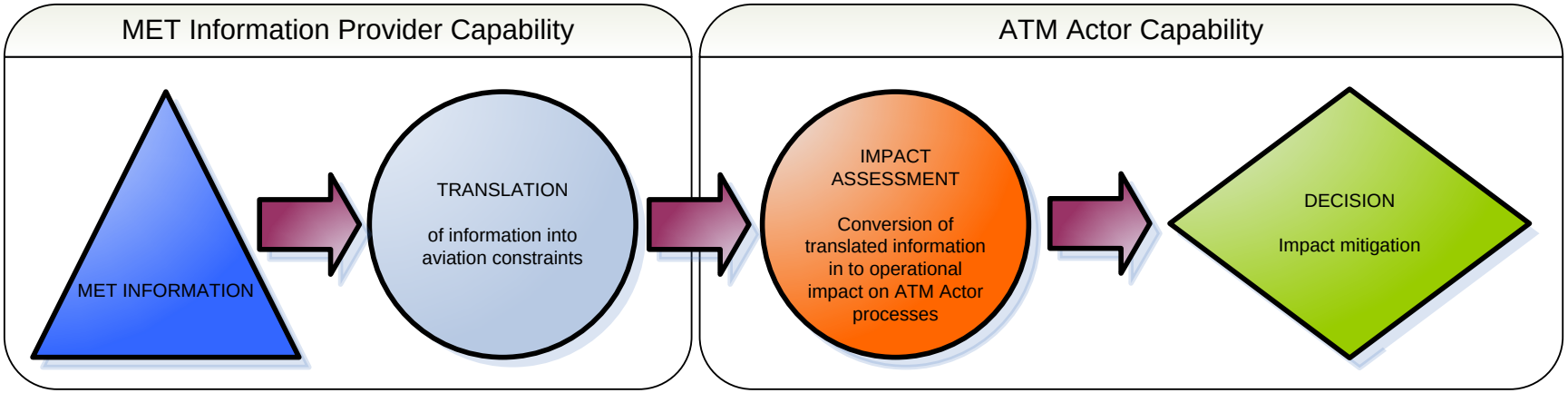
Evolving/new requirements for MET information (2)

- ‘MET Information Integration for Trajectory Based Operations Concept’



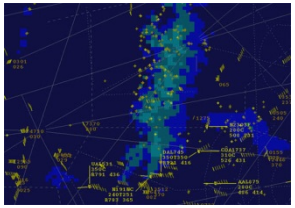
Evolving/new requirements for MET information (3)

Impact Assessment / Risk Management

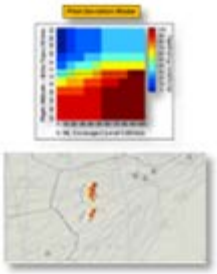


Evolving/new requirements for MET information (4)

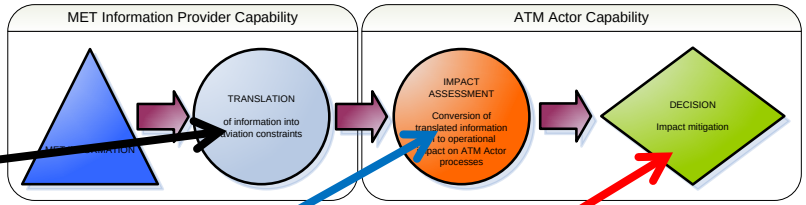
Level 0: No integration
'I need to do it all in my head..'



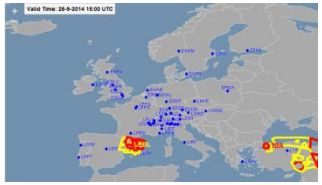
Level 1: 'Weather on the glass'
'It is easier to figure out the impact..'



Level 2: Constraint
Translation to ATM Constraint



MET
ATM



Level 3: Impact
Conversion to ATM Impact

Level 4: Decision Support
Generation of Hierarchical Solutions

MEMBER OF SESAR JOINT UNDERTAKING

Sources: Mitre, FAA, Eurocontrol, ICAO

Evolution towards SWIM

- MET Exchange Model (IWXXM) to replace some TAC
- Recommended practice for METAR/SPECI/TAF/SIGMET: Nov'16

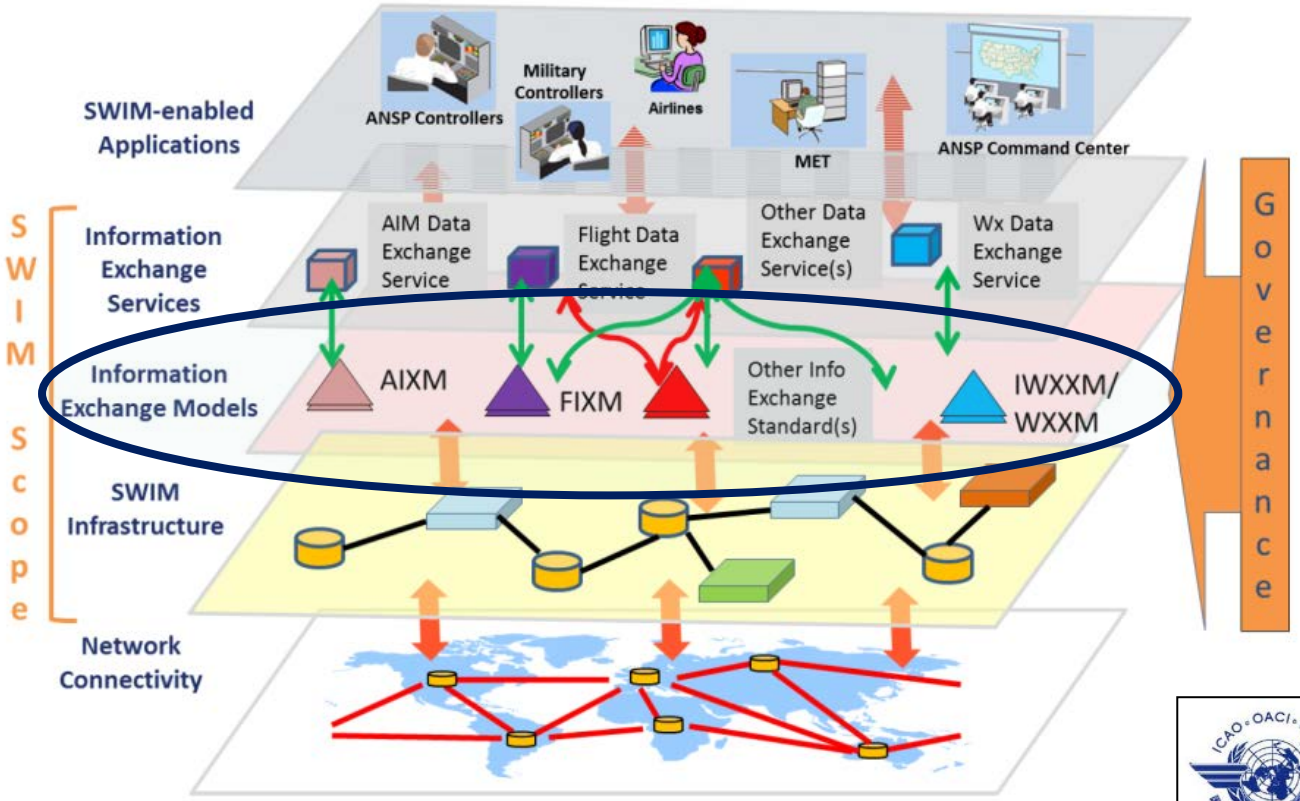


Figure 2. SWIM Global Interoperability Framework

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Evolution of how services are delivered

- ICAO:
  - More ‘centralised’ approach to service provision in support of SIGMET production
  - Ongoing discussion, initial SARPs by 2020?
- Europe:
  - Cooperation of MET service providers proposed implementation projects in context of Single European Sky:
    - Centralised access to consolidated and harmonised information to support 4D trajectory operations
    - Consolidated and harmonised Hazardous Weather information, no FIR boundary issues anymore
    - Weather Radar Composite for Aviation
  - When granted, IOC between 2018 and 2020

Thank you!

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