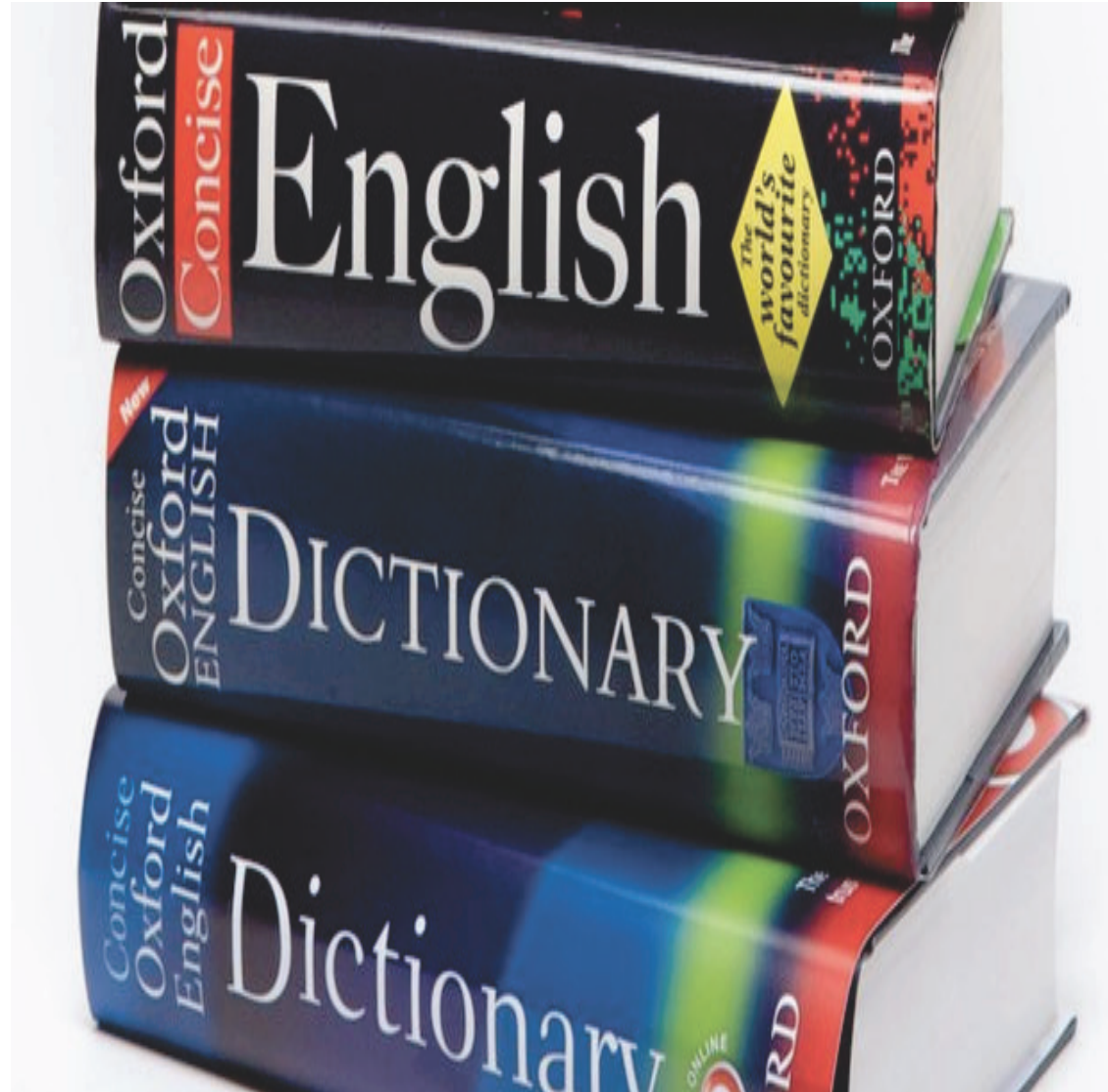




AIRM: The ATM Information Reference Model

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Where would be without dictionaries?



AIRM definition – from Scottish Wiki

A **airm** is a **limm**. Maist humans hae twa airms, comin oot thair body juist ablow the **neck**.

On the end o each airm is a **haund**. Humans uise airms an haunds for tae dae things tae ither **objects**, this is cried **manipulation**.

The primary purpose o the haund is tae grasp **objects**. Some ither primates hae airms that thay uise for tae support thaimselfs as thay walk along the **grund**.




From: <http://sco.wikipedia.org/wiki/Airm>

- **Like** the AIRM we will discuss: Defines terms and relationships between them
- **Unlike** the AIRM we will discuss: it's talking about something else!
- So we pronounce our AIRM as **A – I – R – M**

AIRM: The ATM Information Reference Model

The ATM system-wide reference vocabulary for defining ATM information



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For overview: <http://airm.aero/>

What is the AIRM?

The ATM Information Reference Model (AIRM) is the ATM system-wide reference vocabulary for *defining* ATM information.

 SINTEF

Three parts: Contextual, Conceptual & Logical Models

AIRM Viewer

The AIRM Viewer provides a simplified HTML view of the ATM Information Reference Model (AIRM).

Contextual Model



Terms

This lists the terms and definitions from the source documents that were used to build the AIRM. For example, it includes terms from ICAO annexes and docs, the WMO and European Regulations.



Abbreviations

This lists the abbreviations used in the AIRM.



Conceptual Model

This provides a reference of information entities and relationships relevant to the ATM operational discourse. It is intended for use by operational experts. It can be used, for example, in disambiguating terms used in operational documents and developing information exchange requirements.



Logical Model

This provides a reference model of data concepts for service architects and system implementers. It contains the entities necessary to model the shared information of ATM. It can be used in order to construct "derived" logical data models and, indeed, exchange models or physical data models. As such, it can be used to create a model that can be used to build services and operations.

Contextual Model: Term definitions

Aerodrome

A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Source: ICAO;

Abbreviations: AD

urn: urn:aero:airm:1.0.0:ContextualModel:ATMBusinessTerms:Aerodrome

Aerodrome beacon

Aeronautical beacon used to indicate the location of an aerodrome from the air.

Source: ICAO;

Abbreviations: ABN

urn: urn:aero:airm:1.0.0:ContextualModel:ATMBusinessTerms:Aerodrome_beacon

Aerodrome certificate

A certificate issued by the appropriate authority under applicable regulations for the operation of an aerodrome.

Source: ICAO;

urn: urn:aero:airm:1.0.0:ContextualModel:ATMBusinessTerms:Aerodrome_certificate

Contextual Model: Abbreviations

ADEP

Aerodrome of Departure

Source: ICAO;

urn: urn:aero:airm:1.0.0:ContextualModel:Abbreviations:ADEP

ADES

Aerodrome of Destination

Source: ICAO;

urn: urn:aero:airm:1.0.0:ContextualModel:Abbreviations:ADES

ADS

Automatic dependent surveillance

Source: ICAO;

urn: urn:aero:airm:1.0.0:ContextualModel:Abbreviations:ADS

Conceptual Model - purpose

- Identifies general concepts **defining scope** of ATM, such as:
 - Aircraft
 - Aerodrome
 - Flight
 - 4D Trajectory
 - Organisations
- Provides classification of these, and **relationships between them**
- It builds the **operational language** of ATM

Conceptual Model: "text" view

Flight

The operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.

Source: ICAO Annex 13;

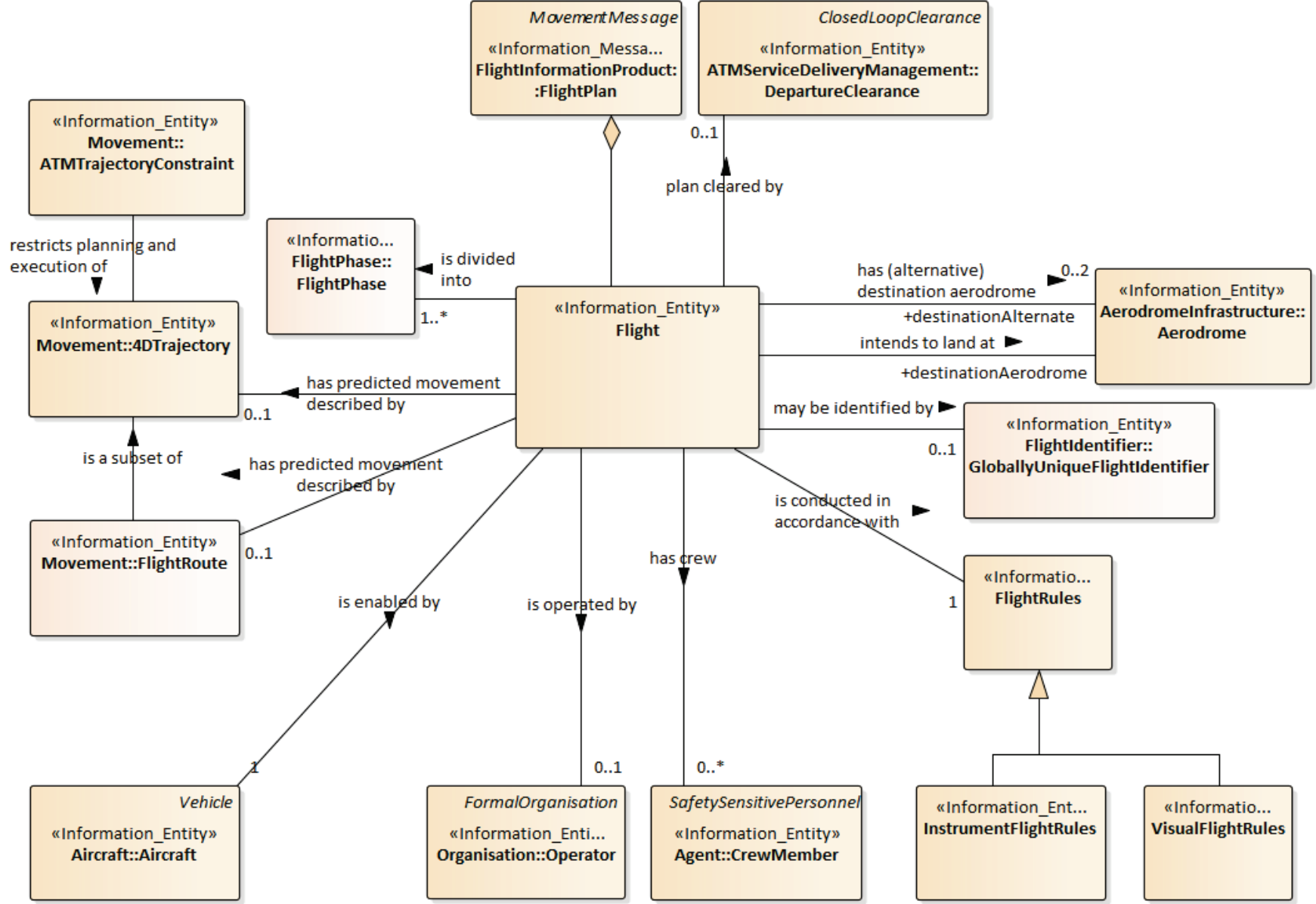
urn: urn:aero:airm:1.0.0:ConceptualModel:Subjects:Flight:Flight

Associations:

Name	Type
may be identified by	AircraftIdentification
may be identified by	GloballyUniqueFlightIdentifier
may be identified by	SSRCode
has predicted movement described by	4DTrajectory
has predicted movement described by	FlightRoute
is conducted in accordance with	FlightRules
has crew	CrewMember
is operated by	Operator
may have	FlightStatus
has	FlightCapability
joins	FormationFlight
leaves	FormationFlight
is divided into	FlightPhase
has take-off alternate	Aerodrome
intends to land at	Aerodrome
has (alternative) destination aerodrome	Aerodrome

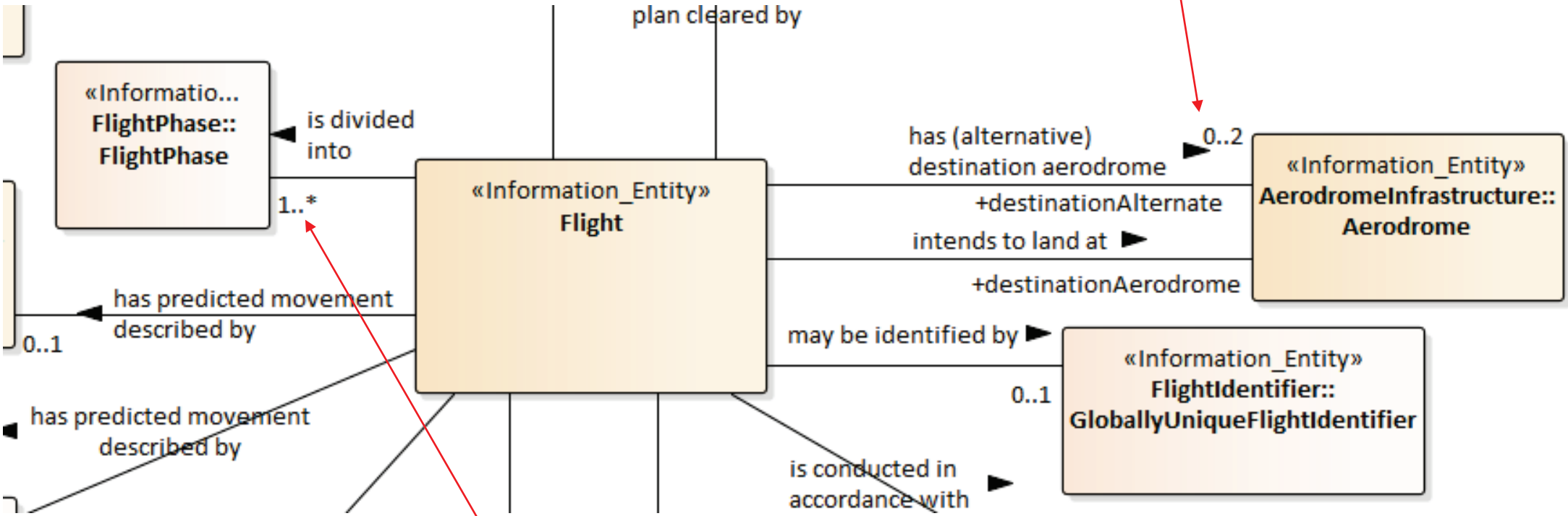
+++ (snapshot incomplete)

Contextual Model: UML diagram view



Contextual Model: UML diagram view (zoomed-in)

Can have zero, one or two alternative destinations.



Must have at least one FlightPhase. Can have many.

Logical Model - purpose


- Focus on **information to be shared** (aka “exchanged”) between different ATM systems
- Provides reference model for **system implementors**
- Can be used to derive **exchange models / physical data models**

Logical Model: “text” view

Flight





The operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.

Source: ICAO Annex 13;

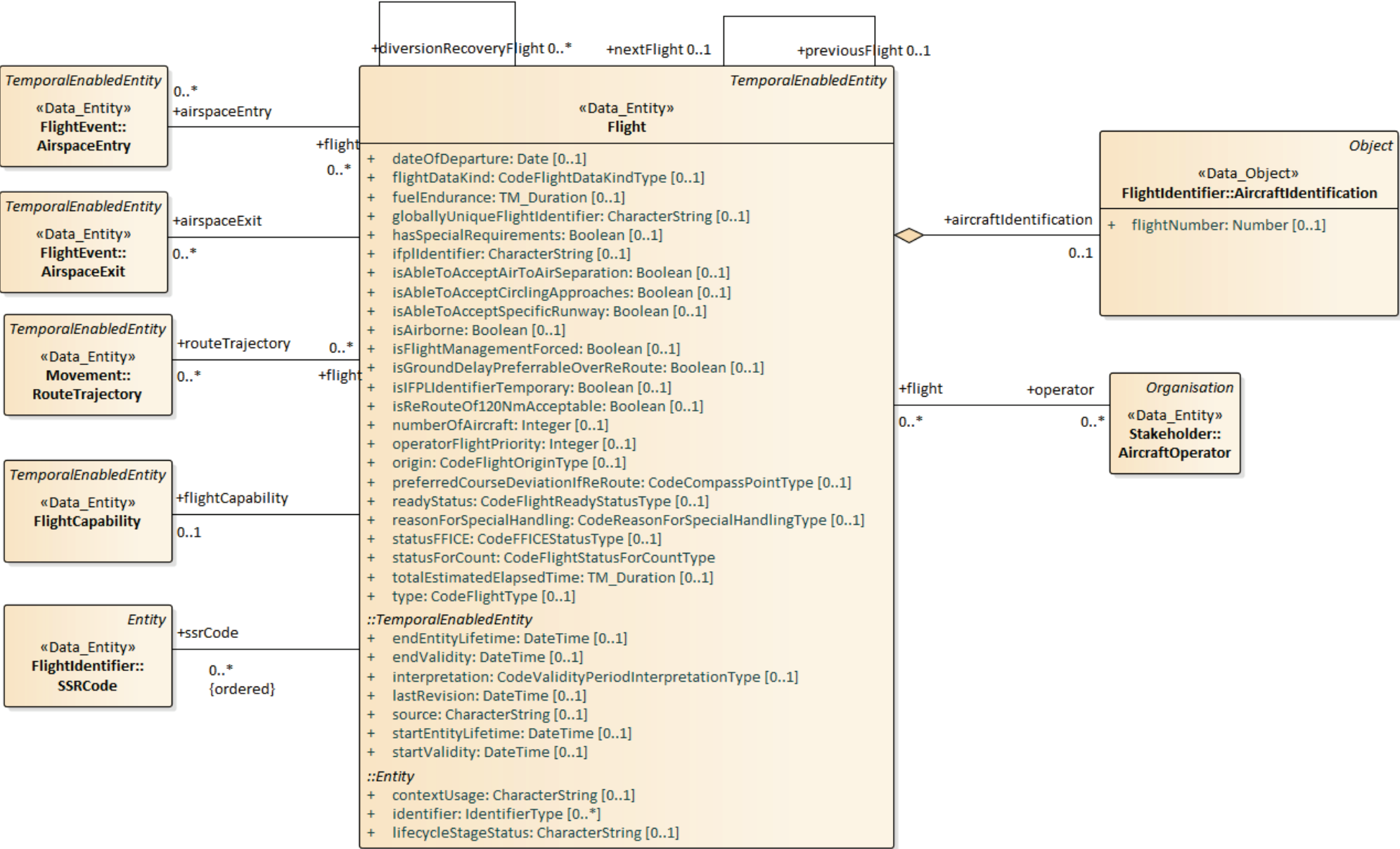
urn: urn:aero:airm:1.0.0:LogicalModel:Subjects:Flight:Flight 

Parent Class: [TemporalEnabledEntity](#);

Properties:

Name	Definition	Type	urn
dateOfDeparture	The date of flight departure.	Date	
flightDataKind	Indication whether the flight information is real or a copy of a real flight (alternative or what-if flight).	CodeFlightDataKindType	
fuelEndurance	The estimated maximum length of time the aircraft can spend in the cruise phase of flight, determined by the amount of fuel at take-off.	TM_Duration	
globallyUniqueFlightIdentifier	A single reference for FF-ICE information pertinent to a flight that is unique globally.	CharacterString	
	Indicator that the flight is expected to be operating in accordance with regulations issued by the relevant	+++ (snapshot incomplete)	

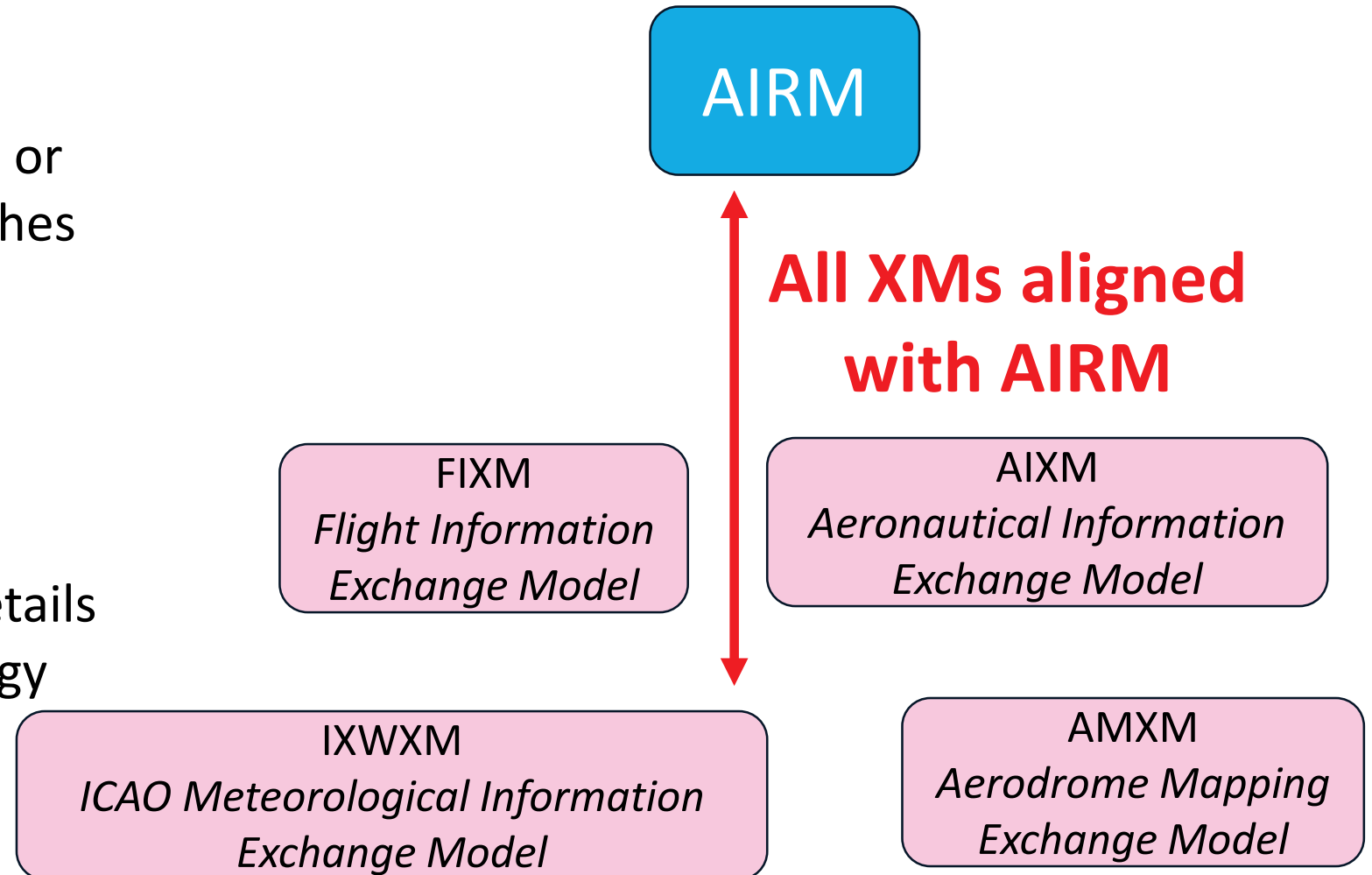
Logical Model: UML diagram view



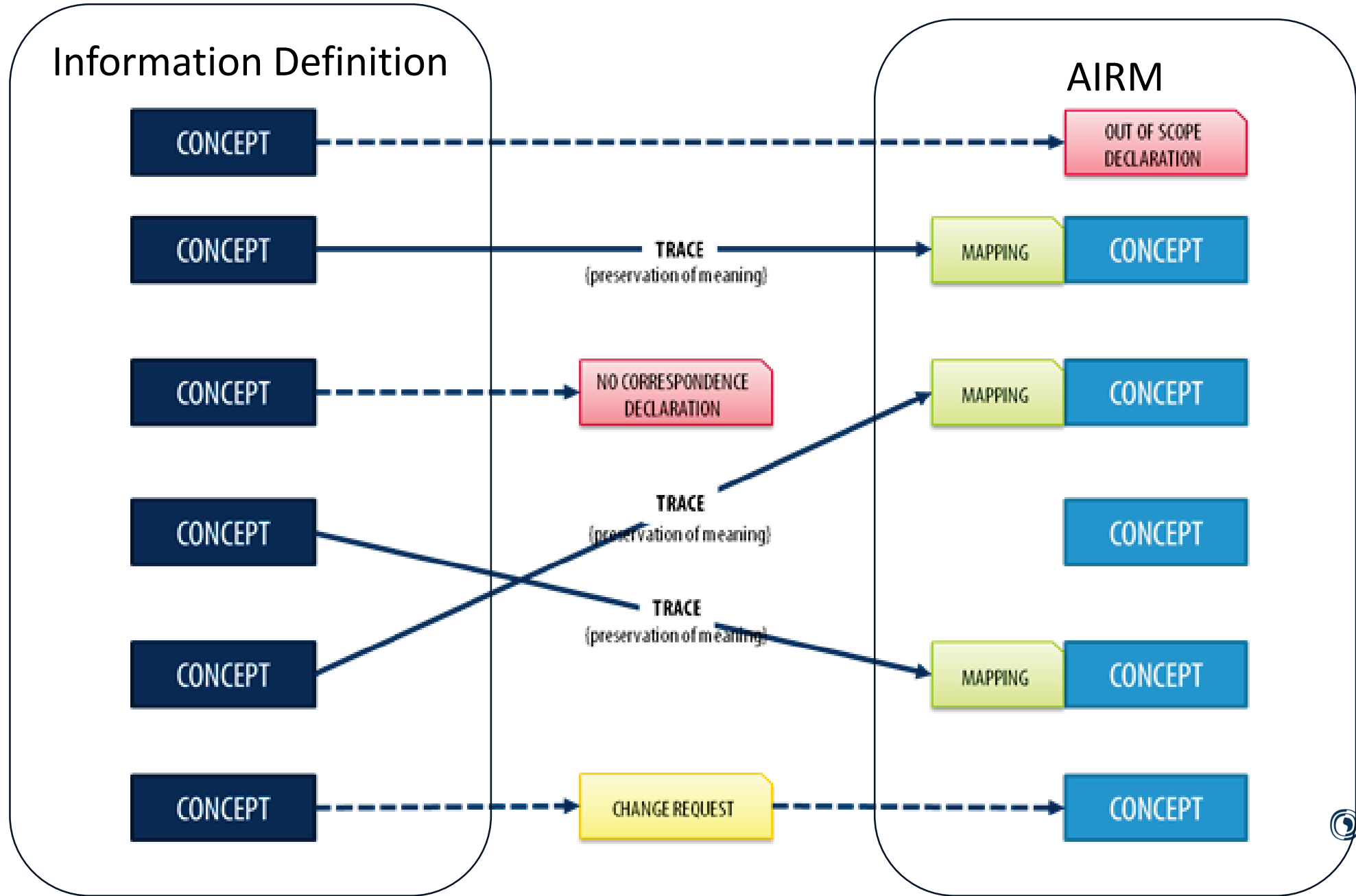
AIRM versus Information Exchange Models

- Reference for semantic interoperability
- Independent of data encoding or specific technological approaches

- Domain specific
- Can include data encoding details
- Can include specific technology choices



EUROCONTROL SWIM Information Specification – uses AIRM



Governance: The AIRM Change Control Board (CCB) and Community



Join the community

There is a role for you.



Contribute

Propose changes to the AIRM and review proposals from other contributors.

[more](#)



Monitor

Follow the latest AIRM discussions and upcoming updates.

[more](#)



AIRM CCB Members

Your organisation can request to join the AIRM Change Control Board (CCB)

[more](#)

AIRM development: SINTEF involved since the start, remain actively involved

2009-2016

- “SESAR” AIRM development in original SESAR programme
- Developed in cooperation with US NEXTGEN programme
- SINTEF involved in small SESAR team responsible for the work
- Developed Governance procedures
- Joe Gorman, SINTEF, CCB chairman

2017-2019

- “EURCONTROL” AIRM adopted widely, including in SESAR 2020
- SINTEF involved in “information” work in PJ19.03 – identifying information needs of other projects
- Joe Gorman, SINTEF, CCB chairman

2020→

- AIRM will continue to be widely used
- International CCB to be established in cooperation with ICAO Information Management Panel



Technology for a better society