



Deciding with Data | Leveraging information to make better data-driven choices.

EUROCAE ED-269 update in support of U-Space concept



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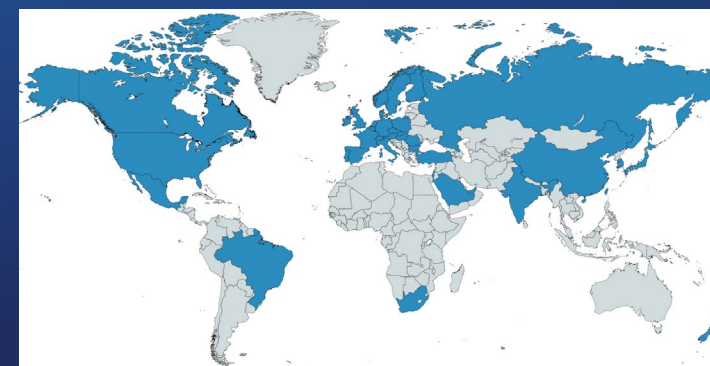
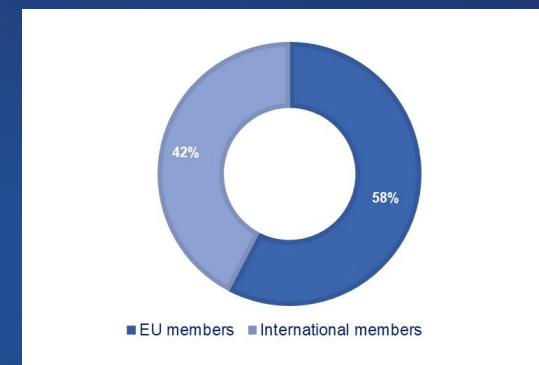




EUROCAE IN BRIEF



- Independent non-profit organisation dedicated to aviation
- Long-standing successful standards issued
- 400+ members, 4500+ experts
- Global coordination ensured



EUROCAE WG 105 (UAS)



- Develop standards for the integration of all types of UAS into all classes of airspace
- Current activities cover the following areas:
 - Detect and Avoid
 - C3, Spectrum, and Security
 - UTM / U-Space
 - Design & Airworthiness
 - Enhanced RPAS Automation
 - SORA

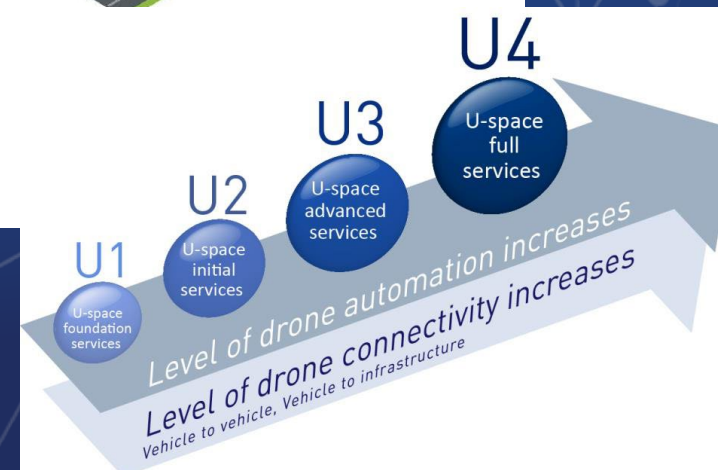
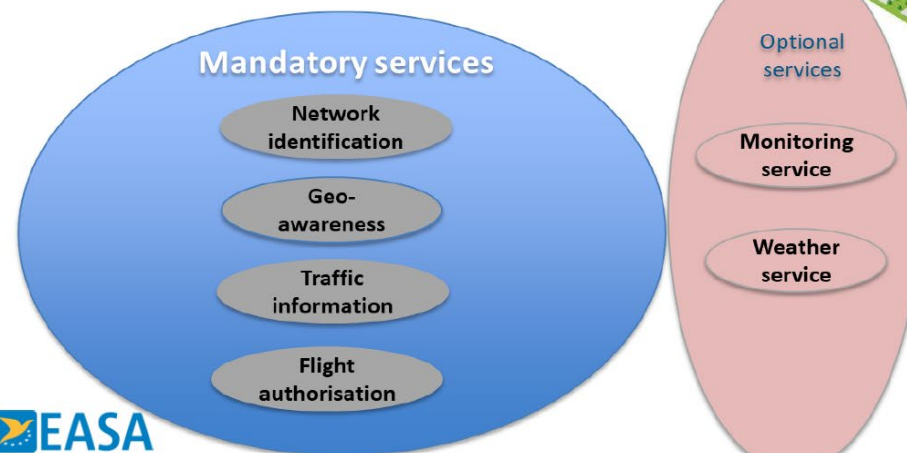
→ *SG-3: U-space activities*

- **Geographical Zones and U-Space data provision and exchange**
- *Network Identification Service of UAV for A/UTM/U-Space*
- *Flight Planning and Authorization Service for Global Awareness in A/UTM in U-Space*
- *Traffic Information/Situation Dissemination Exchange Format and Service*
- *U-Space Geo-Awareness Service*

U-space concept

U-space airspace where some services are provided.

U-space services



EU REGULATORY CONTEXT



COMMISSION IMPLEMENTING REGULATION (EU) 2019/947
of 24 May 2019
on the rules and procedures for the operation of unmanned aircraft



COMMISSION IMPLEMENTING REGULATION (EU) 2021/664
of 22 April 2021
on a regulatory framework for the U-space

“When Member States define UAS geographical zones, for geo awareness purposes they shall ensure that the information on the UAS geographical zones, including their period of validity, is made publicly available in a common unique digital format”

AMC : The ‘common unique digital format’ should be as described in Chapter 8 and Appendix 2 of EUROCAE ED-269

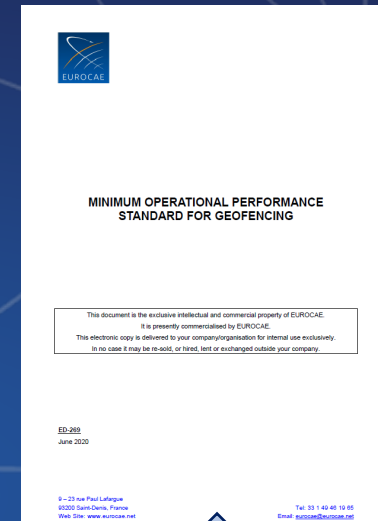
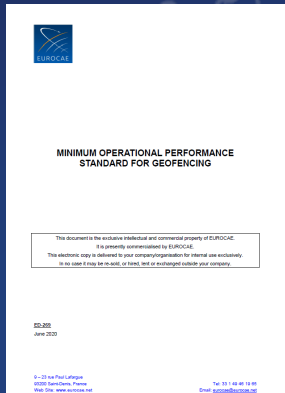
“Exchange of relevant operational data and information between U-space service providers and air traffic service providers in accordance with Article 7(3) is made through an exchange model that

- a. enable the management and distribution of information in digital format;*
- b. describe the exchanged information features, their properties, attributes, data types, and associations;*
- c. include data constraints and validation rules;*
- d. apply a standard data encoding format;*
- e. provide an extension mechanism by which groups of users can extend the properties of existing features and add new features that do not adversely affect standardisation within and across Member States.*

EUROCAE ED-269

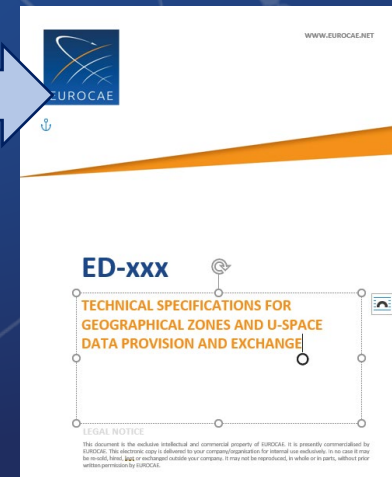
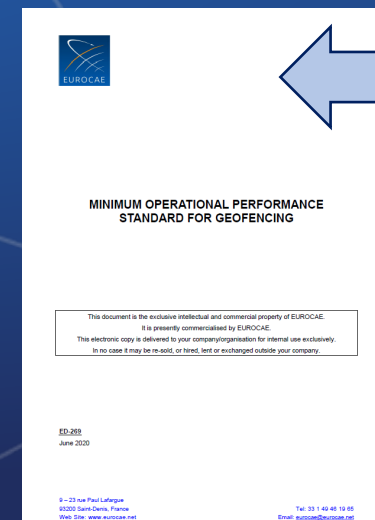
➤ Very good foundation, but...

- Scope is limited (geo-fencing)
- Data model to evolve (to be compatible with new objects and features)
- Needs to be updated following feedback from implementation

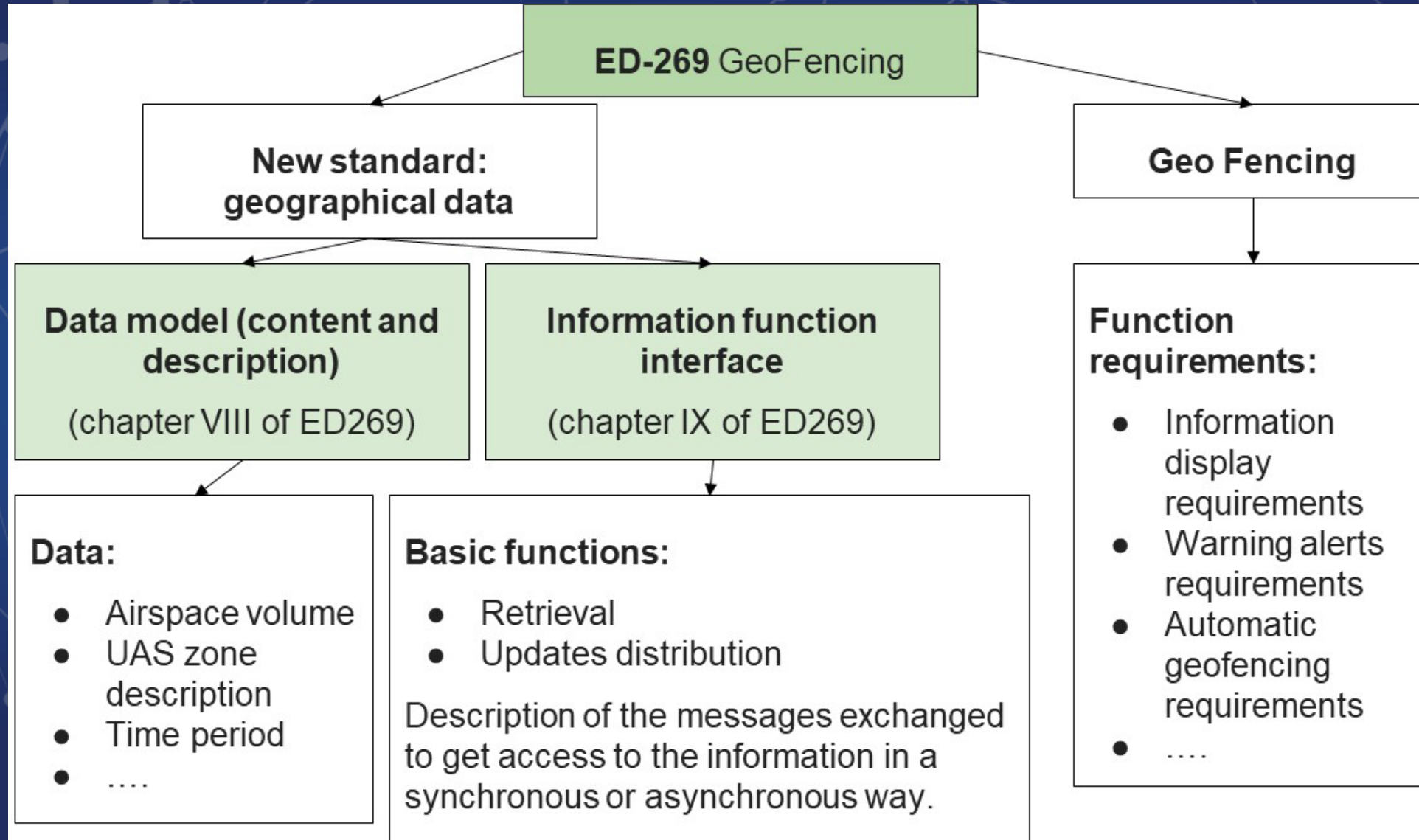


➤ Proposal to split Geo-fencing MOPS (ED269) and the « data standard » (new ED-xxx)

- Consistency scope / standard
- Data standard to address both the data model and the related information service



SPLIT OF ED-269 IN TWO PARTS



NEW STANDARD STRUCTURE

GENERAL INFORMATION

GENERAL

- Introduction, context
- Definitions, reference documents,

SCOPE

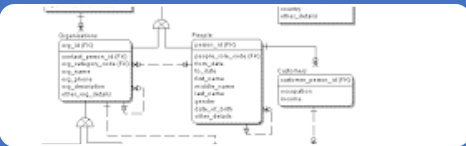
DATA SCOPE

- Clear list of data in-scope
- Additional use cases are supported in principle



REQUIREMENTS FOR DATA IN UTM

- The Data Chain, Data Quality characteristics
- Data Quality Requirements



CONCEPTUAL DATA MODEL

- Classes
- Data types



EXCHANGING DATA THROUGH INFORMATION SERVICES

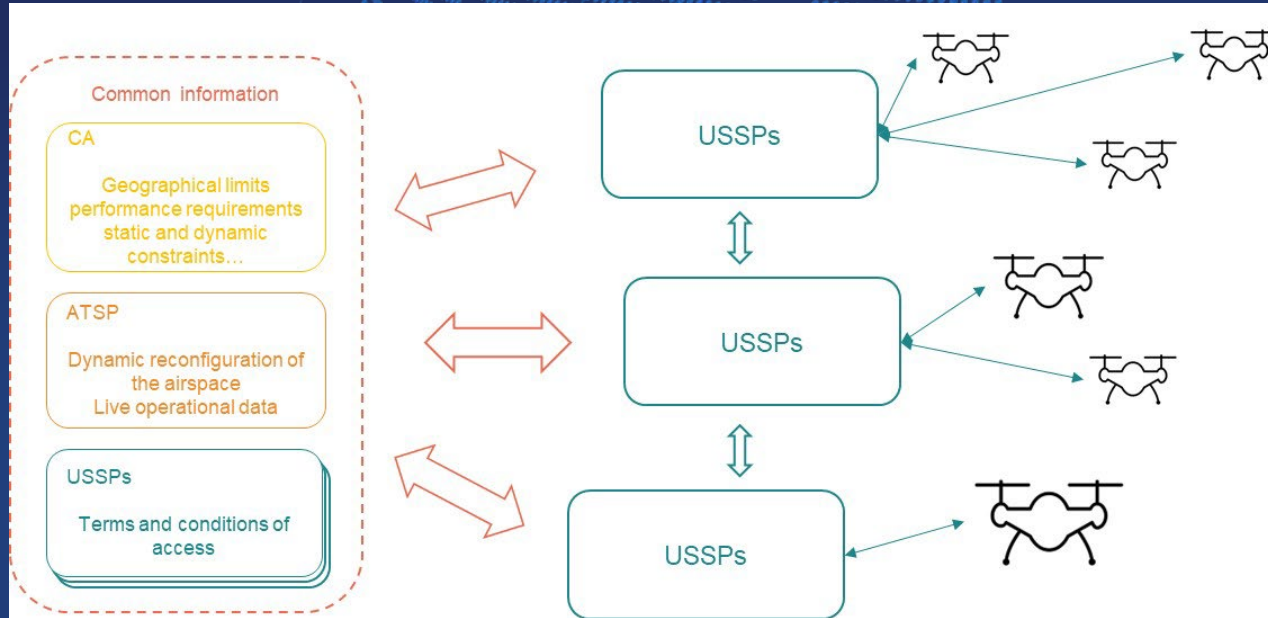
- Digital information interfaces
- Data file exchange interface



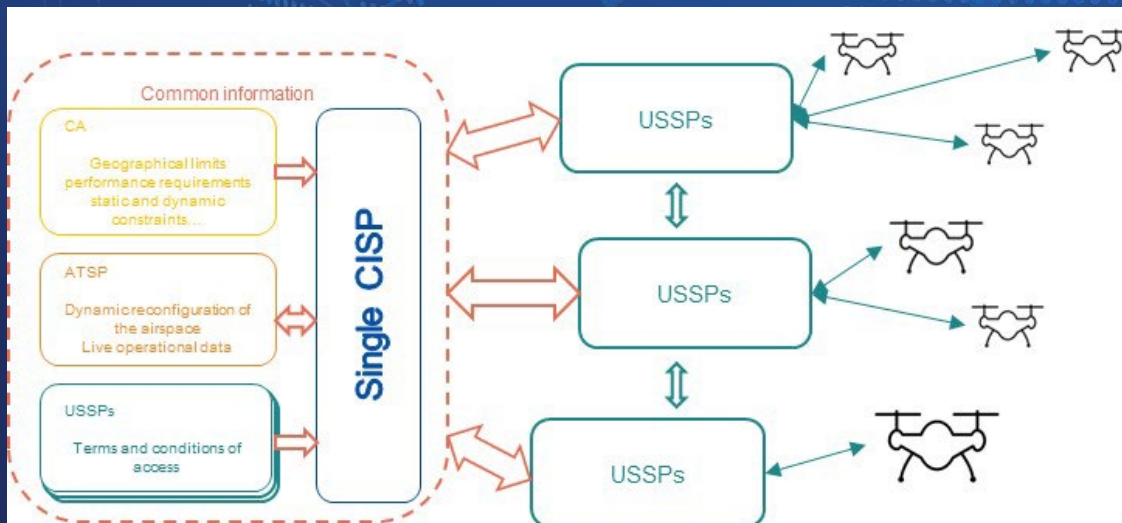
SUPPORTING MATERIAL (APPENDICES)

- Logical consistency checks, Restriction conditions
- Information definition and Data structure, Service example using Open API

U-SPACE DATA EXCHANGES / DATA SCOPE



- Horizontal and vertical limits of the U-space airspace (and any adjacent U-space airspace)
- Static and dynamic airspace restrictions permanently or temporarily limiting the volume of airspace within the U-space airspace where UAS operations can take place,
- UAS geographical zones relevant to the U-space airspace
- The following requirements :
 - the UAS capabilities and performance requirements,
 - the U-space services performance requirements,
 - the applicable operational conditions and airspace constraints)



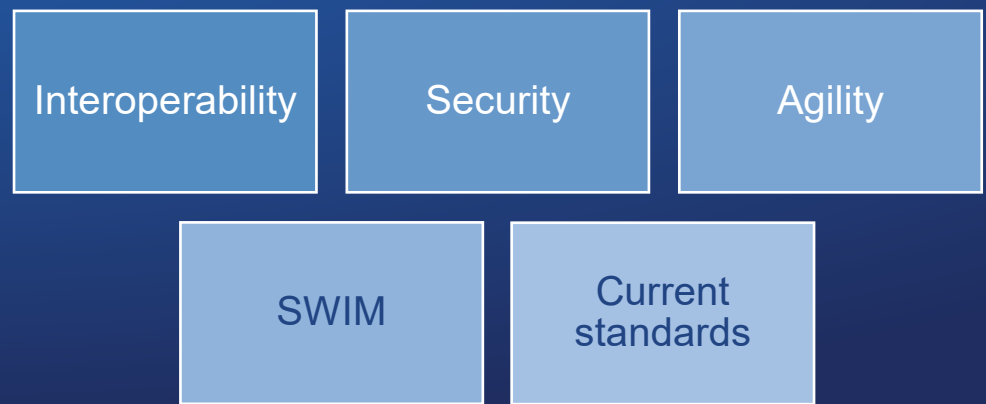
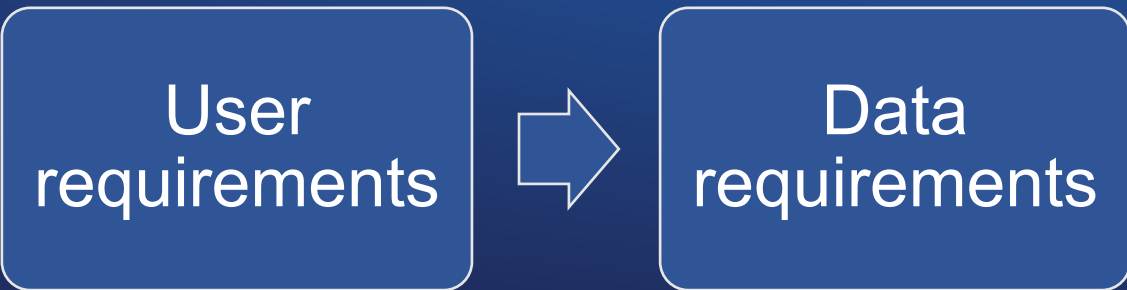
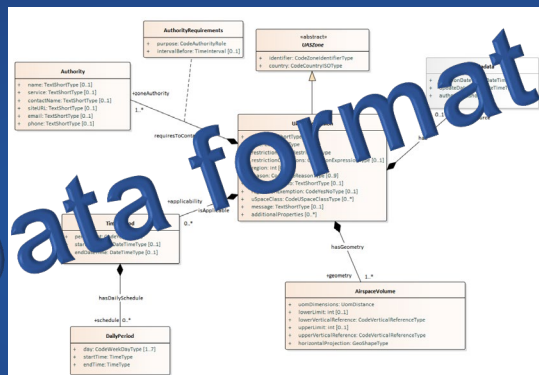
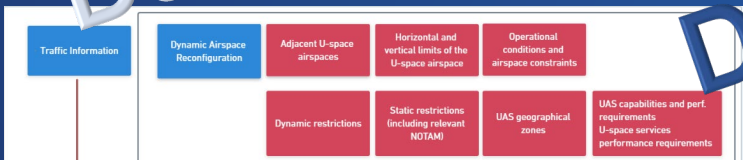
MAIN PRINCIPLES

Data

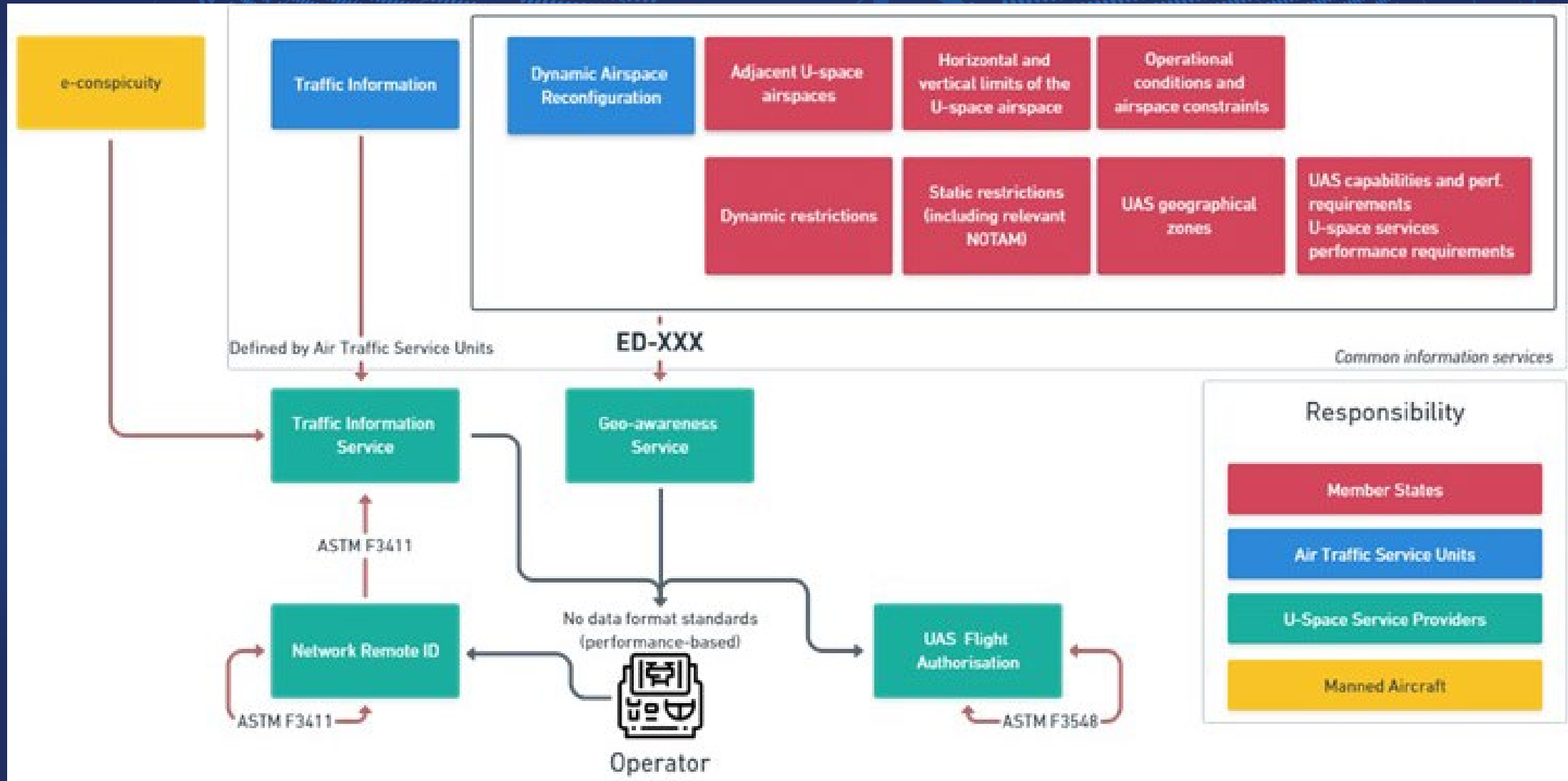
Information Services

Data scope

Data format



DATA TYPES AND APPLICATIONS



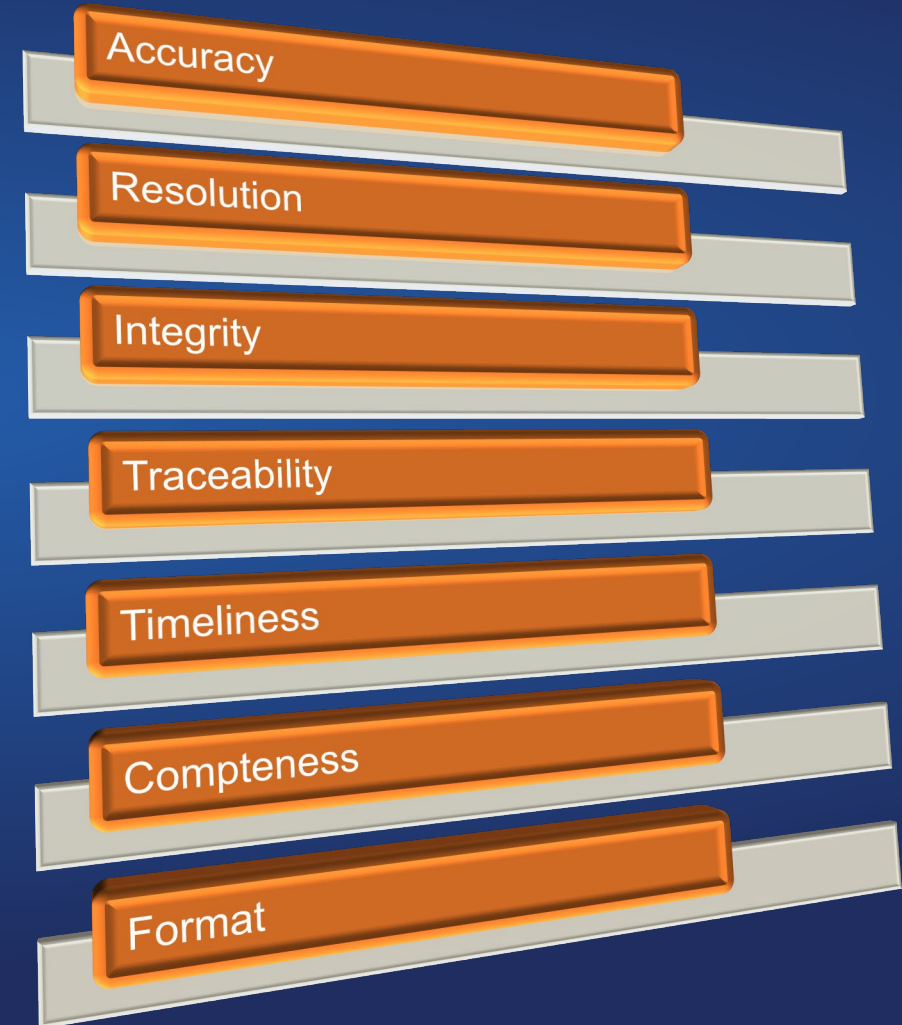
DATA QUALITY IS KEY



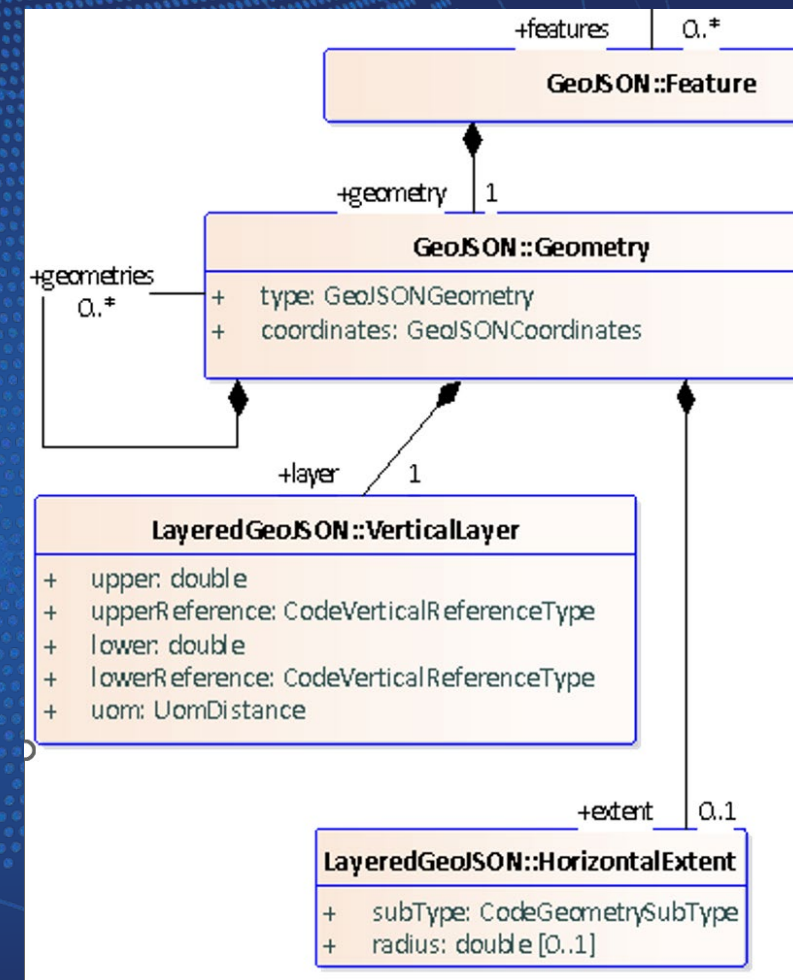
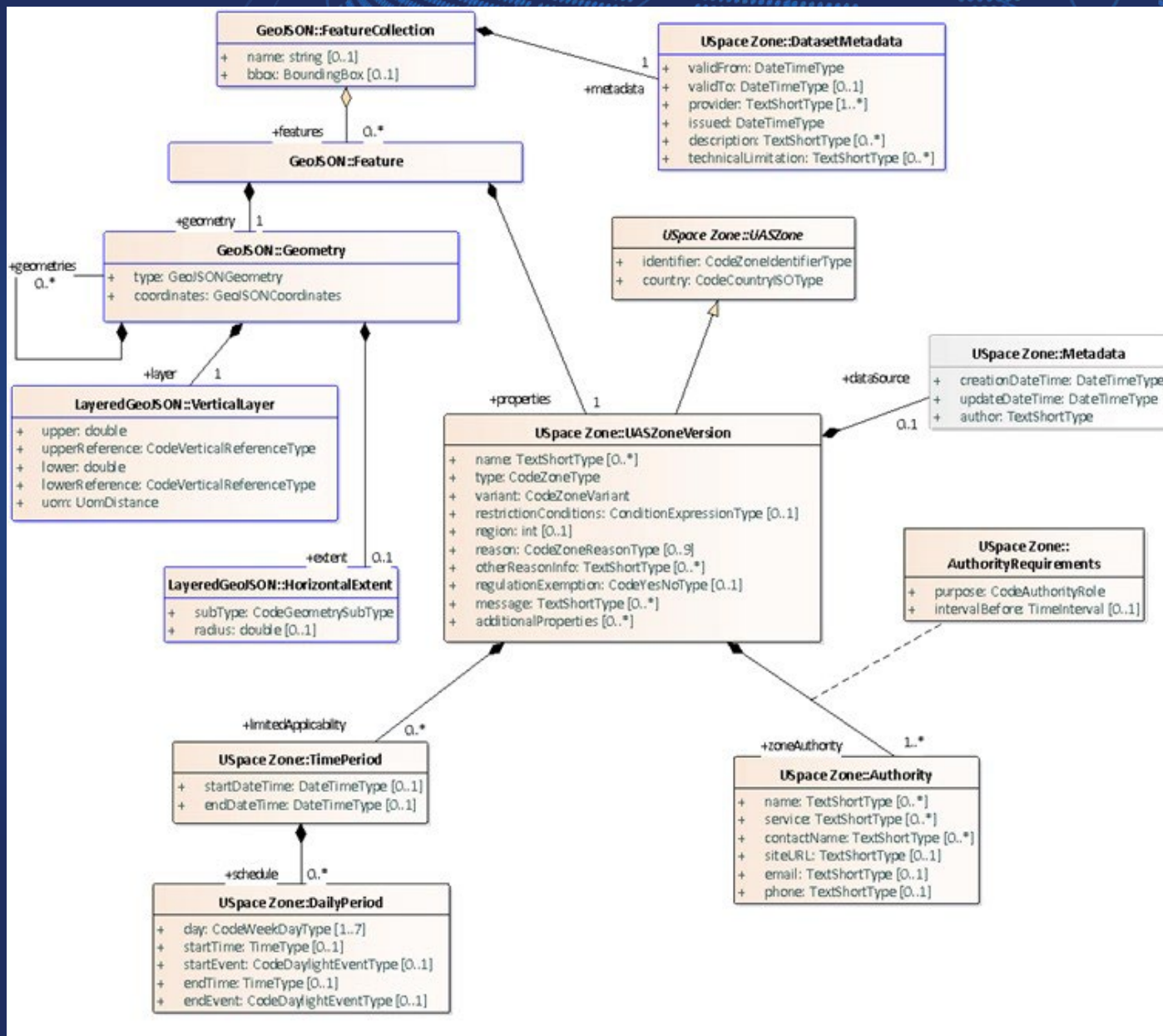
(Qualitative – non quantitative)
Data Quality Requirements
derived from ED76/DO200

+ Documentation Requirements

Data quality characteristics



THE DATA MODEL



INFORMATION SERVICES

➤ 2 main functions

- **UAS Zone Information Retrieval** - enables the synchronous retrieval of all UAS Zone information available for a particular timeframe, airspace and region of interest.
- **UAS Zone Information Updates Distribution** - enables the user to receive asynchronously UAS Zone information updates, whenever this happens, for a particular timeframe, airspace and region of interest.

➤ Non functional requirements

- Preservation of information integrity
- Authenticity of information (OAuth2 methods or equivalent)
- Availability of audit trail (traceability of exchanged information)
- Feedback / issue reporting (recommendation)



INTERFACE OVERVIEW



EXAMPLE : Retrieve UASZones Operation

➤ “UASZonesRequest” message with the two following optional :

- Volume of interest, expressed as:
 - An airspace volume as defined by the requester
 - Regions of interest, as a predefined element
- Period of interest (date/time) indicated by start and end date time, as an option

```

"UASZonesRequest": {
  "type": "object",
  "properties": {
    "airspaceVolume": {
      "$ref":
"UASZoneAirspaceVolume.json"
    },
    "regions": {
      "type": "array",
      "items": {
        "type": "integer"
      }
    },
    "startDateTime": {
      "type": "string",
      "format": "date-time"
    },
    "endDateTime": {
      "type": "string",
      "format": "date-time"
    }
  }
}

```

```

"UASZonesReply": {
  "type": "object",
  "required": [
    "genericReply"
  ],
  "properties": {
    "UASZoneList": {
      "type": "array",
      "items": {
        "$ref": "UASZone.json"
      }
    },
    "genericReply": {
      "$ref": "#/definitions/genericReply"
    }
  }
}

```


SUPPORTING MATERIAL

- Data Providers and data users may use **logical consistency checks** for the data they exchange, aimed at ensuring data is error free and meets the standard requirements

A.3 Country Code

Country codes should match the ISO 3166-1 alpha-3 [standard](#)

A.4 Circle Geometry

When geometry is specified as a circle, the radius shall be a value greater than zero and of double type.

A.5 Temporal Validity

Two items define the temporal validity of a given dataset, the date range of applicability (TimePeriod) and the times at which, within the date range, the areas are applicable (DailyPeriod).

➤ Restriction conditions

- how to handle the restrictedConditions field to evaluate the conditions under which the zone can be used
- Evaluation supported for manual and in an automated way
- 3 types of restrictions:
 - numeric restriction, imposing a maximum or minimum value, e.g. MAX_NOISE
 - textual restriction, requiring a specific value for e.g. UAS class.
 - simple restriction, not having a value, but its presence indicates a requirement, e.g. NO_PHOTOGRAPH

➤ Information definition and data structure

➤ Service example using OpenAPI

Name	Description	Values/Units
UAS_CLASS	Classification of the uas, as defined by EU 2019/945	LEGACY, C0, C1, C2, C3, C4, C5, C6
UAS_CATEGORY	Category of the UAS Operation as defined by EU 2019/947	OPEN, SPECIFIC, CERTIFIED
UAS_OPERATION_MODE	The mode of the UAS flight or UAS operation as defined by EU 2019/947	VLOS, BVLOS
MAX_NOISE	Maximum noise level must be below the specified value. The noise level is described in EU 2019/945 and GM12 Article 3(4) U-space airspace.	Numeric value, unit to be decided: dB(A)

TIMEFRAME – NOW AND BEYOND



April 2021- May 2023

Draft standard
development by
EUROCAE WG105

Summer 2023

EUROCAE
Open Consultation

Fall 2023

New Standard
Publication

As from End 2023

Potential updates
with U-space
developments



Questions?



Thank You!

ATIEC 2023

AIR TRANSPORTATION INFORMATION EXCHANGE CONFERENCE