BCO Network

BCO Network WEBseries 17
Cloud Interoperability Study

18 November 2025

Speaker:
Peter Kroon, WIK

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Save the date

2026 BCO Network

In-Country Workshop

Prague, Czech Republic

11-12 June, 2026

Registrations open soon

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BCO in-person event *under the auspices of the Cyprus Presidency of the Council of the EU 2026*

From vision to action: empowering skills development, capacity building and inclusive learning for Europe's digital future

Brussels, Belgium

22 April, 2026

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Our Next Workshops

5G Quality-of-Service for mobile networks by Professor Antonio Capone (PoliMI, Italy)

02 December 2025

Evolving backbone needs - the growth of data centers

09 December 2025

How to fill the digital gap: two successful examples of broadband deployment in remote areas: *ERMES and FTTH Gigabit Access Network Deployment in ultra-rural areas in Castilla Y Leon projects*

16 December 2025

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Cloud Interoperability – EC projects

Presentation for the Broadband Competence Offices (BCO) Network

18th of November 2025

Autor:

Ing. Peter Kroon

Senior consultant

WIK-Consult GmbH

Agenda

1	Introduction - consortium, regulations
2	Project objectives (interoperability / switching charges)
3	Methodology – Interoperability
4	Priority Areas
5	Screening of Standards & Specifications
6	Online Repository
7	Closing Remarks

1. Introduction & Context

Our consortium, roles & responsibilities

WIK-Consult

Regulatory expertise

- Ilsa Godlovitch / Martin Lundborg – project lead IOP
- Peter Kroon - senior consultant - IOP
- Antonia Niederprüm – team lead Switching Costs
- Desislava Sabeva – senior consultant – Switching Costs

DECISION

Cloud expertise

- Olivier Colon, project /team lead Switching costs
- Mark Reeve, cloud specialist
- Cedric Lebon, cloud specialist

Schuman Associates

Online repository

- Jan Droege – Team lead IOP
- Dimitra Vasilia / Davide Casarin – consultants IOP

1. Introduction - regulatory Framework

- **Data Act obliges in respect to interoperability:**
  - Art. 23/34 - Remove obstacles to switching and enabling of multi-cloud environments
  - Art. 30 - For Infrastructure - Ensure functional equivalence for same service type (Art. 30)
  - Art. 30 – For OS, software and applications for same service type, ensure
    - Open interfaces
    - Compliance with standards and specifications in the central online repository
    - Art. 35 - specifies **compliance criteria** for candidates for inclusion in the **EU repository** (and hence become mandatory within 12 months).
    - Art. 35(3) links compliance also to Annex II of Regulation (EU) 1025/2012: coherence & governance requirements for ICT standards.
  - Art. 30 – in case no standard/spec available in repository, then support structured, machine-readable data export when switching providers

- **Data Act mandates in respect to switching charges and egress fees:**
  - Switching charges : include data egress fees and other costs imposed when moving between cloud providers or back to on-premises systems.
  - From Jan 2024, **progressive reduction** of cloud switching charges.
  - By Jan 2027, full **withdrawal** of cloud switching charges

2. Objectives and deliverables – cloud interoperability

Objectives / deliverables

- Operationalize compliance criteria from Data Act.
- Define validation processes (for repeated application)
- Identify first batch of candidates for the repository
- Enable online repository

What has been done?

- Interviews with stakeholders / extensive online survey and workshop to confirm findings

Scope

Focus on PaaS and SaaS Services (as compliance obligation for repository is for non infrastructure related cloud services).

Status quo?

- Final report approved – publication still to follow
- Online repository structure available – not accessible yet

2. Objectives and deliverables – Cloud switching charges

Objectives

- Provide a comprehensive view of how switching charges, egress fees and related costs evolve between 2025 and 2027 across the EU27 and benchmark internationally.
- Monitor cloud service prices (IaaS, PaaS, SaaS) to detect CSP cost-shifting strategies
- Assess compliance with the Data Act and identify potential anti-competitive practices.

Scope:

- Focus on IaaS & PaaS, as these layers are central to interoperability and switching
- EU27 coverage + international benchmarks (US, UK, Japan, Singapore, Switzerland).
- Quantitative monitoring (1,500–2,000 price points) with qualitative insights from CSPs and cloud users.

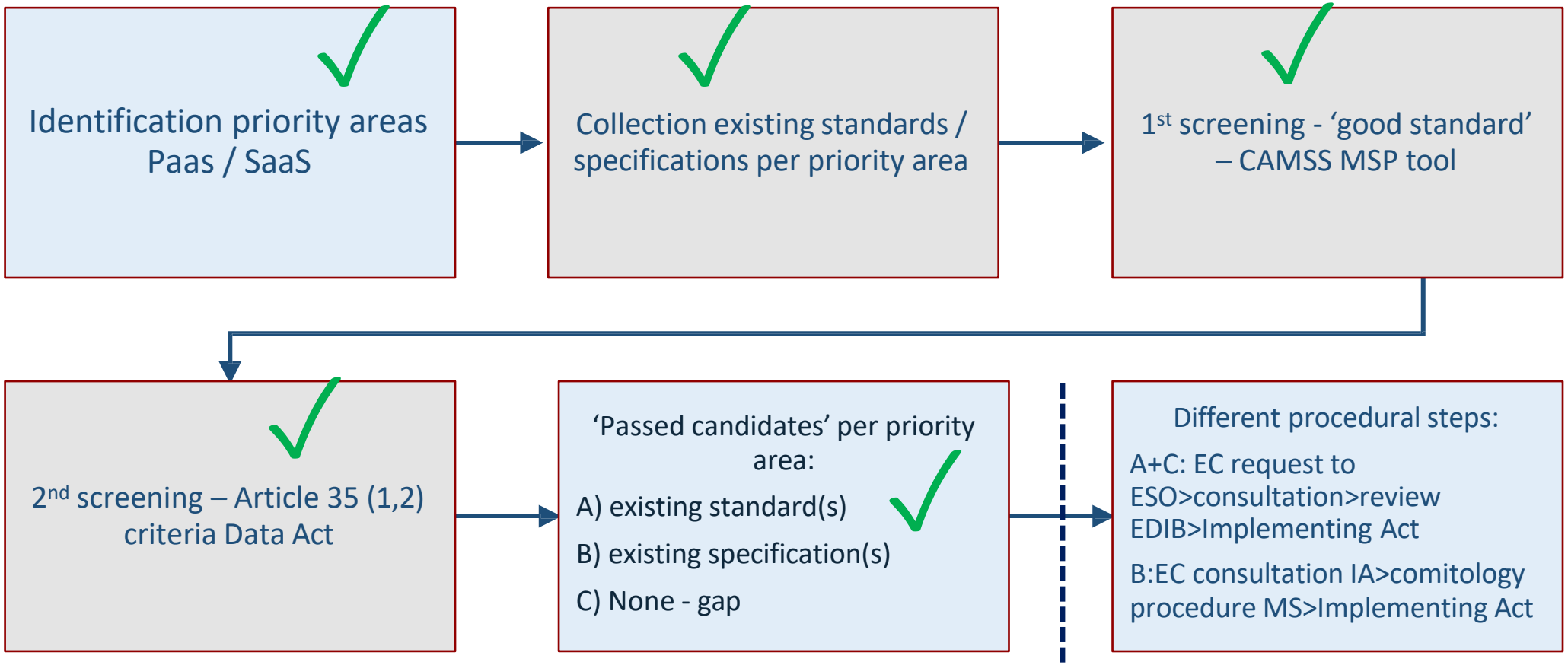
Deliverables

- Regular monitoring reports for 2025, 2026, and 2027.
- Independent evaluation of price trends, compliance, and market dynamics.
- Strategic insights to support EU digital sovereignty.

Status quo?

- 2025 Report approved – results will not be published.

3. Overall process project – cloud interoperability

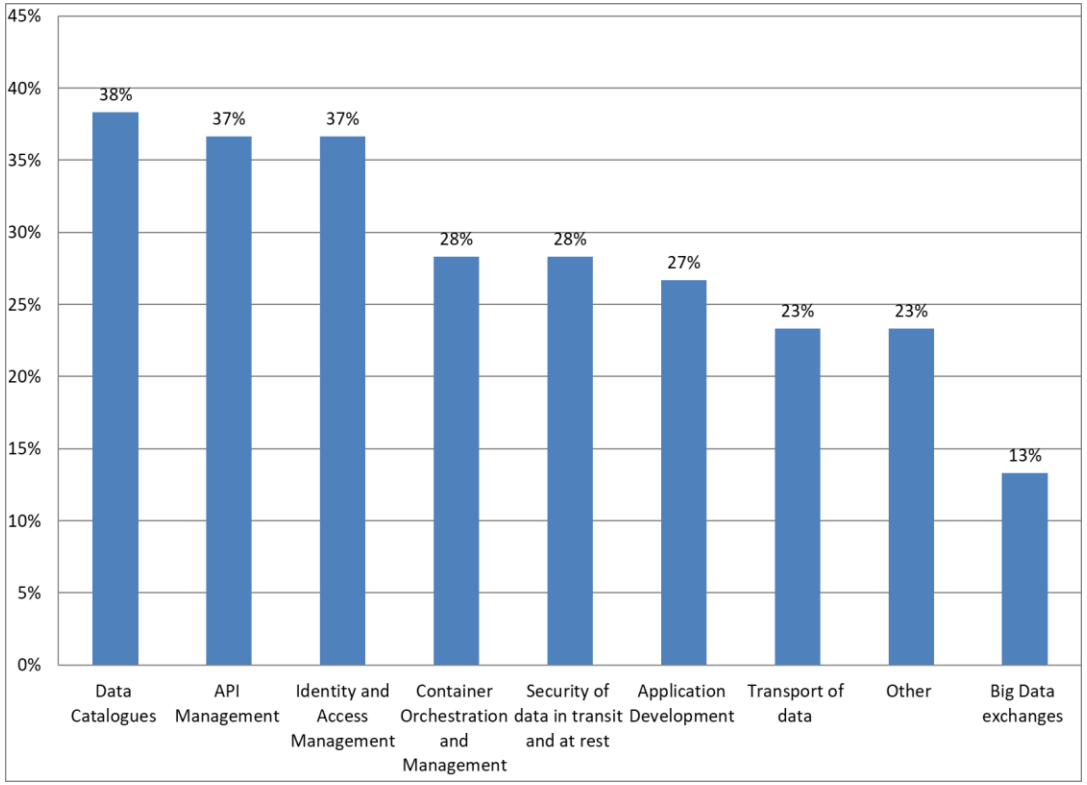


Source: WIK-Consult. ESO = EU Standardisation Organisation, EDIB = EU Data Innovation Board, IA= Implementing Act.

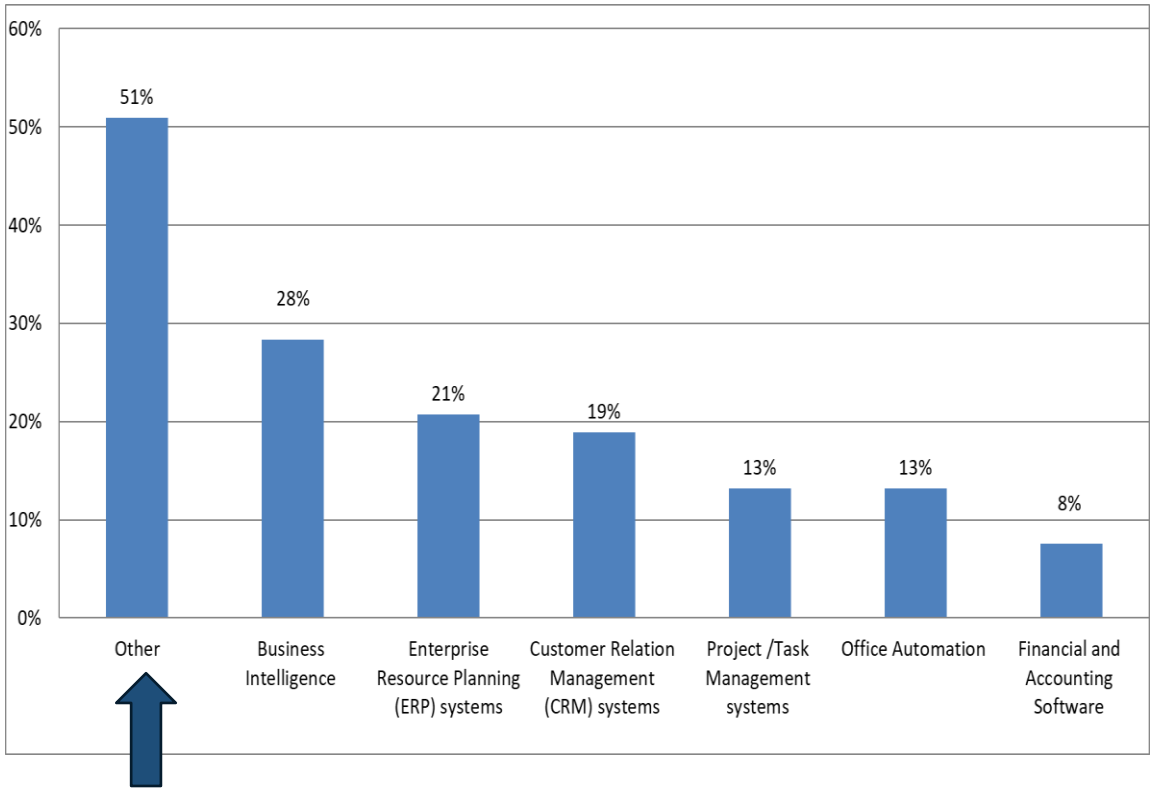
4. Findings - priority areas for standardisation interoperability

Considered input – indicated priority areas from online survey

PaaS



SaaS



Note: used categories in survey were already more granular than market data, but still less detailed than categories in proposed taxonomy.

Main comment: SaaS = vendor specific, so difficult to standardise without hindering innovation. Focus on generic (SaaS) solutions.

Source: WIK Consult online survey (12/12/2024-17/01/2025), N=60 all respondents

4. Findings - identified Priority Areas

Based on 75/25% weighting online survey / marketsize

- PaaS - Top 7 Priority Areas (**initial focus**)
  - Application Development (35%)
  - Identity & Access Management (IAM) (30%)
  - Data Catalogues (29%)
  - API Management (28%)
  - Container Orchestration & Management (21%)
  - Security of Data (in transit & at rest) (21%)
  - Transport of Data (17%)

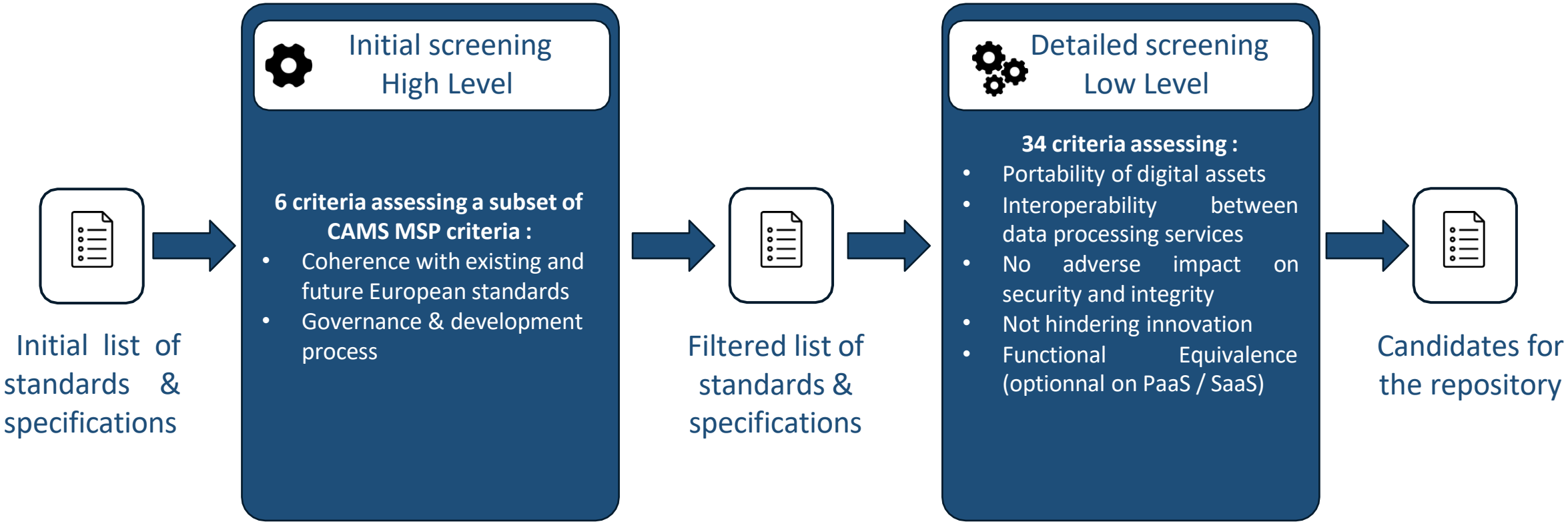
Collection of existing standards / open specifications – focus on IOP and applicable for all sectors (generic)

- SaaS Areas (**limited** initial focus)
  - ERP
  - Business Intelligence (BI)
  - CRM
  - Project Management tools.

considered second priority due to high vendor specificity and innovation constraints

5: Approach screening

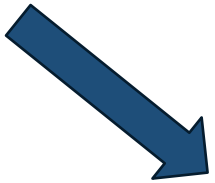
A 2-step screening process allowing to control the screening effort



5: Approach screening

Illustration with developed criteria

Criterion Categories	Criterion Sub Categories
Portability of digital assets	Semantic Interoperability
Interoperability between data processing services	Operational Interoperability
	Technical Interoperability
No adverse impact on security and integrity	Compliance and governance
	System security and integrity
Not hindering innovation	Extensibility and Adaptability
	Openness and flexibility
	Legal & Contractual Compliance
Functional Equivalence (optionnal on PaaS / SaaS)	Consistent service-level behavior



Sample Criterion for a Standard

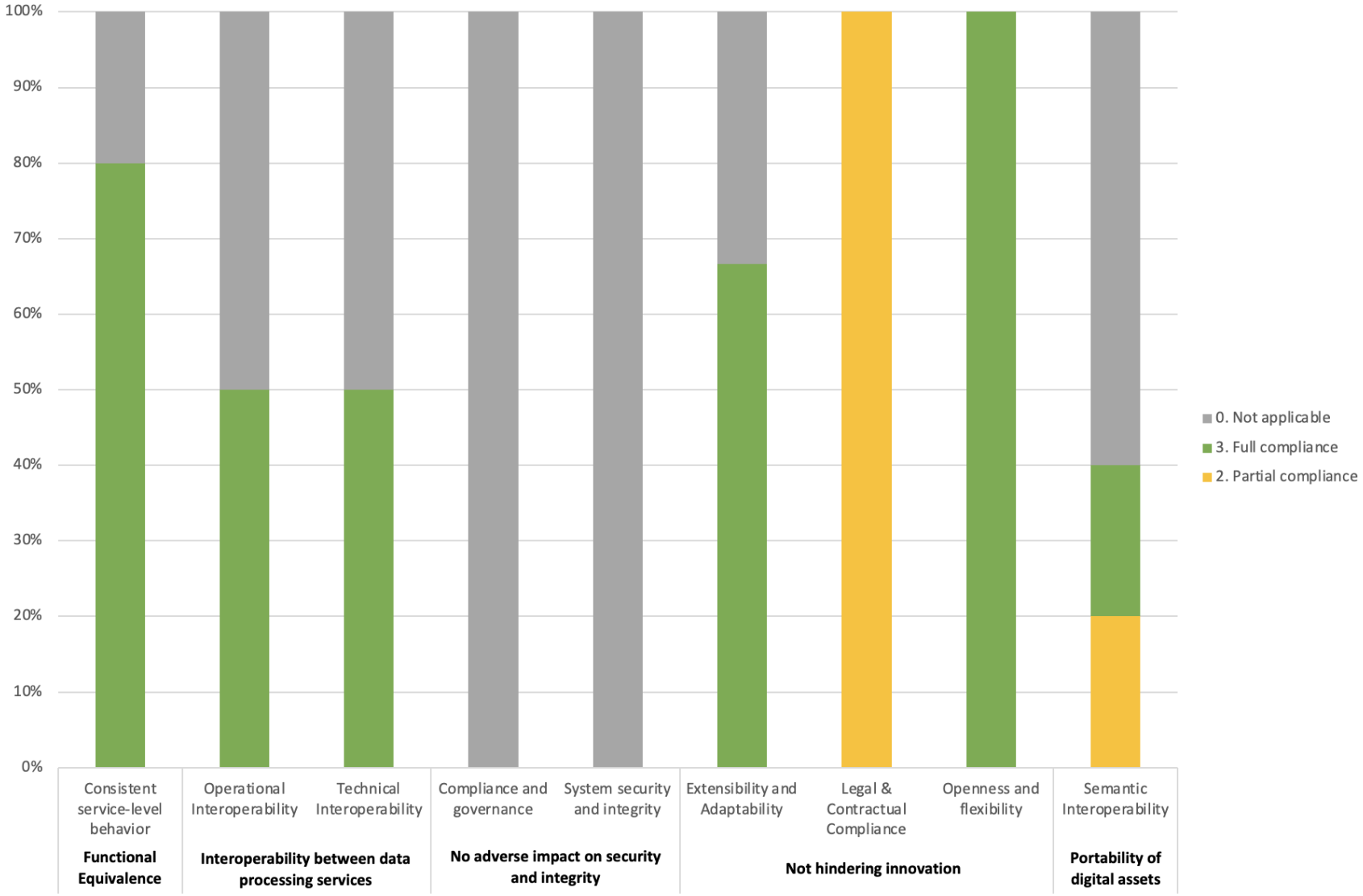
The standard shall define principles, capabilities or frameworks to define a common data model in order to ensure semantic consistency across platforms

Sample Criterion for a Specification

The specification shall implement mechanisms or technologies such as Widely accepted vocabularies like DCAT-AP, Dublin Core, Schema.org, ISO 11179 or domain-specific ones are mandated

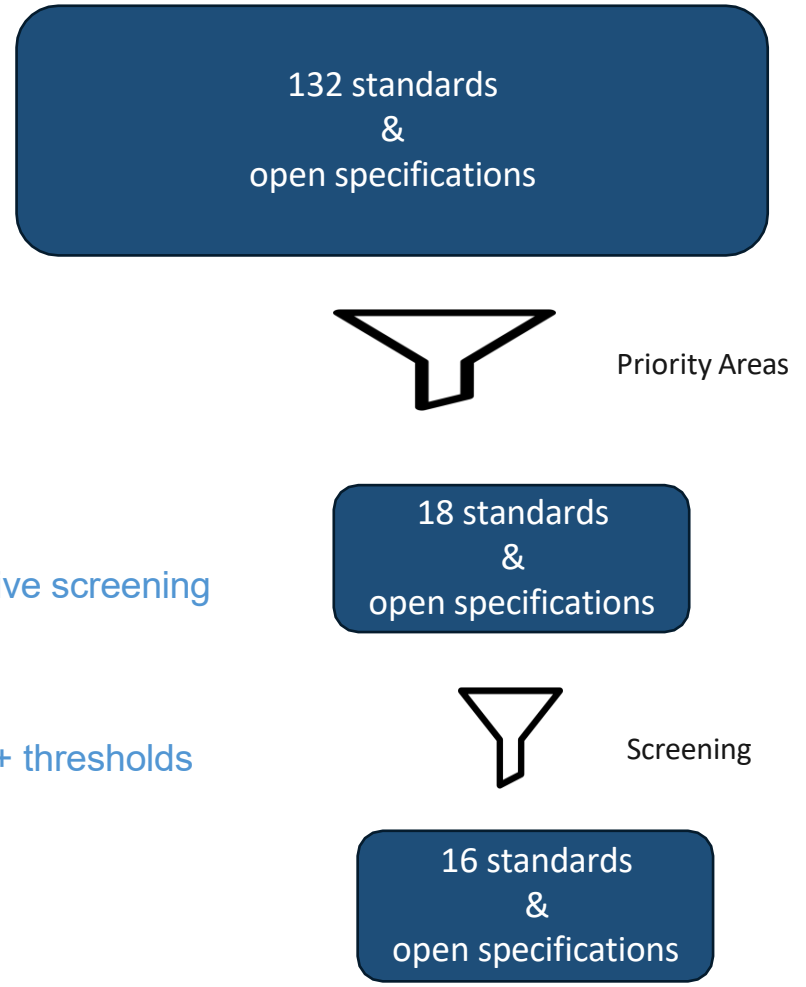
5: Approach screening

Why we needed to introduce a weighing system



5. Approach - screening

- Sources:
  - Desk research (ISO/IEC, IETF, OASIS, ETSI).
  - Stakeholder interviews, surveys, and workshop inputs.
- Priority Areas Selection:
  - Data-driven + stakeholder-driven approach:
    - 75% weight → stakeholder input (survey, interviews, workshops).
    - 25% weight → European market size data of PaaS/SaaS cloud segments
- Two-Step Screening:
  - Step 1 – Governance & Coherence (Annex II criteria via CAMSS MSP) – less extensive screening
    - Non-profit SDOs, open participation, transparency, FRAND licensing.
    - Minimum compliance thresholds per category (e.g. governance ≥ 4/6).
  - Step 2 – Operational Compliance (Article 35 criteria) – newly operationalized criteria + thresholds
    - Interoperability (transport, syntactic, semantic, behavioural, policy).
    - Data portability (syntactic, semantic, policy).
    - No negative impact on security & innovation.
- Stakeholder engagement:
    - 80% agreed on the two-step screening methodology
    - 73% approved priority-setting approach

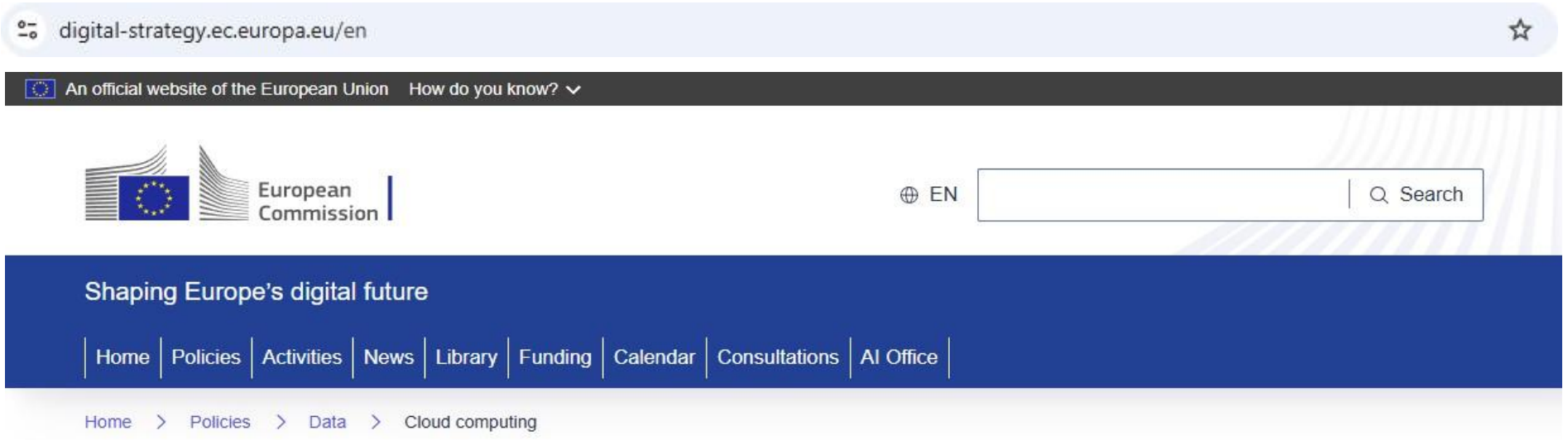


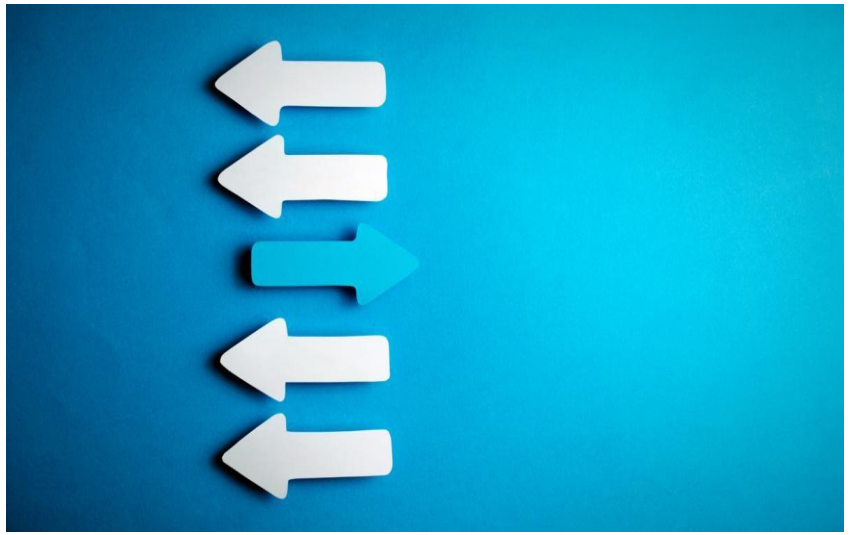
5. Findings – Screening

pre-selection by EC/WIK from gathered full list	priority area	Result step 1 screening
OCI	Container orchestration	passed
OASIS-TOSCA	Container orchestration	passed
Open API	Api Management	passed
S3 API	Transport of data	failed
XML	Transport of data	passed
JSON	Transport of data	passed
CSV	Transport of data	passed
Apache Iceberg	Transport of data / Big data exchanges	passed
CDMI	Transport of data	passed
SAML	Identity and Access Management	passed
OIDC	Identity and Access Management	passed
ISO IEC 19941-2017	Transport of data	failed
SECA	Api Management	passed
SQL	Transport of data	passed
OAuth	Identity and Access Management	passed
Async API	Api Management	passed
Odata	Api Management	passed
GraphQL	Api Management	passed

6. Online repository

Repository under the Digital Strategy website

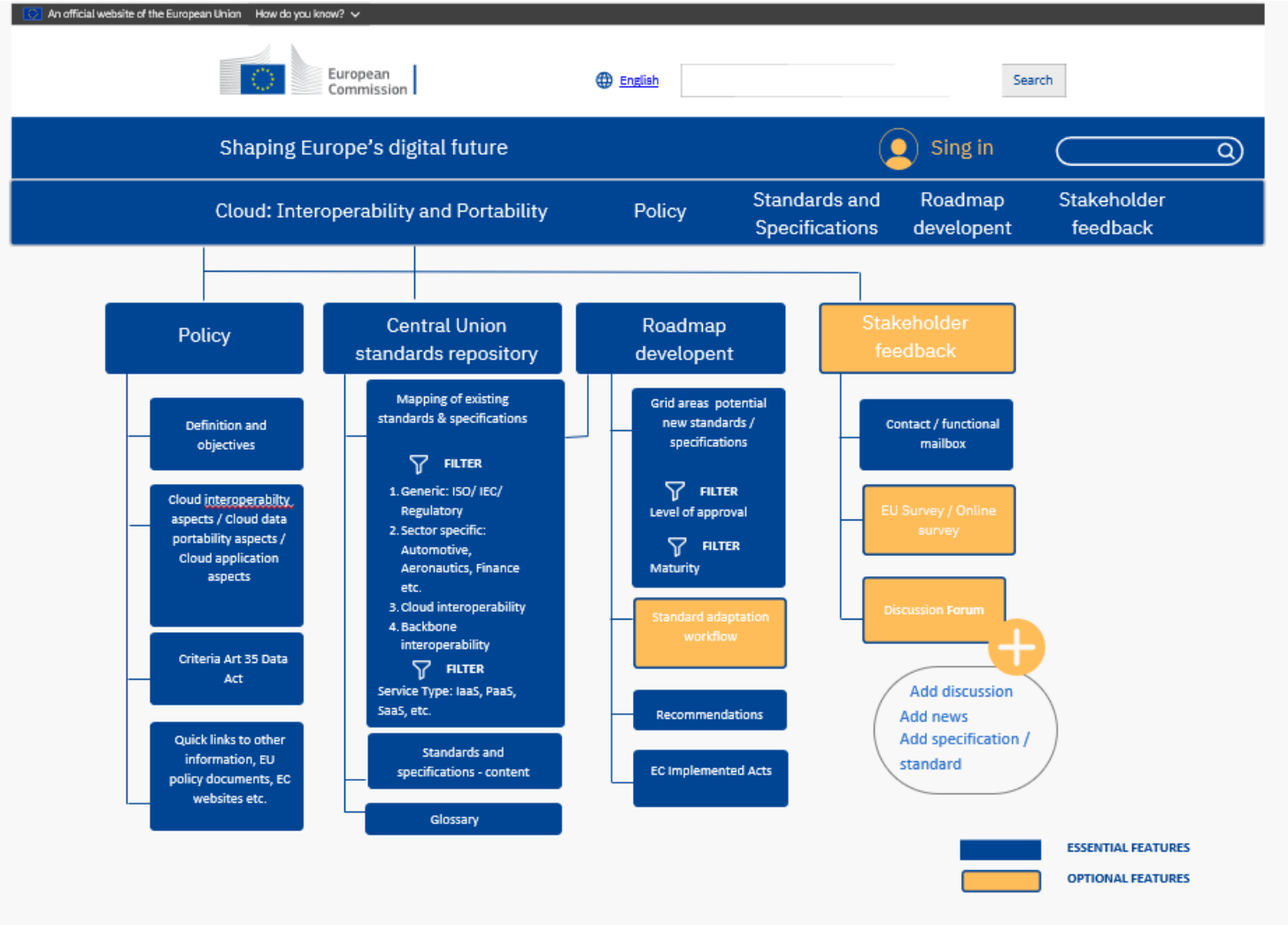




The Repository will be hosted on the Digital Strategy website, ensuring alignment with the website's design, functionalities, and user experience standards.

This means that the Repository's structure, data presentation and technical set up must adhere to the capabilities and limitation of the Digital Strategy website.

6. Structure – Online repository



7. Closing Remarks - interoperability

Presenter's opinions

- **Start with existing generic standards and open specifications and focus on PaaS.**
  - Seven **open specifications** did pass the screening. Endorsement by EC will confirm or adapt our proposal.
  - Harmonized standards have potential candidates and are still being discussed as they will require adaptation in scope and governance
  - Formalization of SaaS related standards or specifications (often sector specific) preferably be **led by customer groups** as these are more differentiated to avoid hindering innovation
  - Focus primarily on generic standards as their adoption is easy to measure across CSPs (sector specific ones will require to have coordination bodies in each of the sectors)

- **Important aspect before mandating sector specific standards or specifications: for which cloud service types this applies**
  - Involve the industry in the definition and adoption of the proposed service types to avoid mandating any specification for the wrong service types