Open Data Maturity

Quality

2025
Open Data Maturity Report

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Chapter 6: Open data quality

The quality of data refers to how accurate, complete, consistent, timely and usable a dataset is. Preparing high-quality data includes dealing with missing values and other inaccurate elements, harmonising data structures and making the data available in accessible formats. Data quality also depends on the quality of its deployment on national portals, which can be assessed by looking at the use of aspects such as open data licences, machine-readable data formats, unique resource identifiers (a character sequence that identifies a dataset) and a linked data approach (a set of design principles for relating datasets to one another).

In addition to the data itself, high-quality data is accompanied by good descriptions. Such descriptive data is called metadata and gives information about the dataset, such as author, date and keywords. Specifications define the structure and content of metadata descriptions and aim to make public sector data more easily searchable across borders and sectors. In particular, the Data Catalogue Vocabulary – Application Profile (DCAT-AP) is designed to describe public sector datasets in Europe and is, therefore, the reference specification in the open data maturity (ODM) assessment methodology. The recent DCAT-AP-HVD extension further enhances these specifications to support the description of high-value datasets (HVDs) across Europe.

High-quality data has greater value because it is more easily discoverable, accessible, interoperable and reusable – aligning with the FAIR principles (findable, accessible, interoperable and reusable). This value comes from characteristics such as being easier for reusers to analyse and visualise. Consistent and well-documented formats and metadata improve discoverability and interoperability, while clear licensing and structured descriptions ensure accessibility and legal reuse. High-quality metadata further supports these principles by helping search engines match dataset descriptions to user queries, making data easier to find and correctly interpret.

The **quality** dimension of the ODM assessment encourages national portals to publish datasets with high-quality data and metadata. The ODM methodology emphasises metadata quality, not only because national portals rely on it to make datasets discoverable and support metadata harvesting, but also because it ensures interoperability, reusability, compliance with standards and effective data management. The methodology also evaluates whether portal managers offer guidance and processes that enable and incentivise data publishers to provide high-quality data.

In brief, the quality dimension assesses the measures adopted by portal managers to ensure the systematic and timely harvesting of metadata and the monitoring mechanisms in place to ensure the publication of metadata that is compliant with the DCAT-AP metadata standard and several deployment quality requirements. Table 1 summarises the key elements of the quality dimension.

Table 1: Indicators of the quality dimension

Indicator	Key elements
Metadata currency and completeness	This indicator assesses whether metadata is kept current and complete. It looks at systematic approaches for timely updates, automation of harvesting and minimal delay between source changes and portal updates. It also considers coverage of historical and contemporary data and measures to ensure interoperability of HVDs across countries.
Monitoring and measures	This indicator explores how metadata quality and licensing compliance are monitored. It considers whether mechanisms track quality and if results are published. It also looks at standards for metadata and licences, guidelines for providers and support activities to help them publish high-quality metadata and choose appropriate licences.
DCAT-AP compliance	This indicator evaluates adherence to the DCAT-AP standard. It looks at compliance with mandatory, recommended and optional classes, and whether guidelines and tools assist providers. It also considers the existence of national DCAT-AP extensions, monitoring of compliance and efforts to address common gaps.
Deployment quality and linked data	This indicator assesses the quality of data and metadata deployment. It considers whether models such as the 5-star open data model or FAIR principles are used, the share of datasets meeting open and machine-readable standards, and the use of structured licences. It also looks at linking practices, including the use of uniform resource identifiers and connections to other data sources.

This chapter will first present overall performance in the quality dimension and then provide a summary of the results and best practices for each indicator.

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6.1. Overall performance in the quality dimension

The quality dimension is the third most mature dimension of the ODM assessment according to the EU-27 average in 2025 (Figure 1:). The average maturity of EU Member States in the quality dimension is 83 %. This is a 4-percentage-point (pp) increase from 2024, primarily driven by a 7-pp increase in the 'metadata currency and completeness' indicator and a 4-pp increase in the 'deployment quality and linked data' indicator. The 'DCAT-AP compliance' (+3 pp) and the 'monitoring and measures' (+2 pp) indicators also increased. Overall, 19 countries score above the EU average, with 10 achieving 90 % or higher.

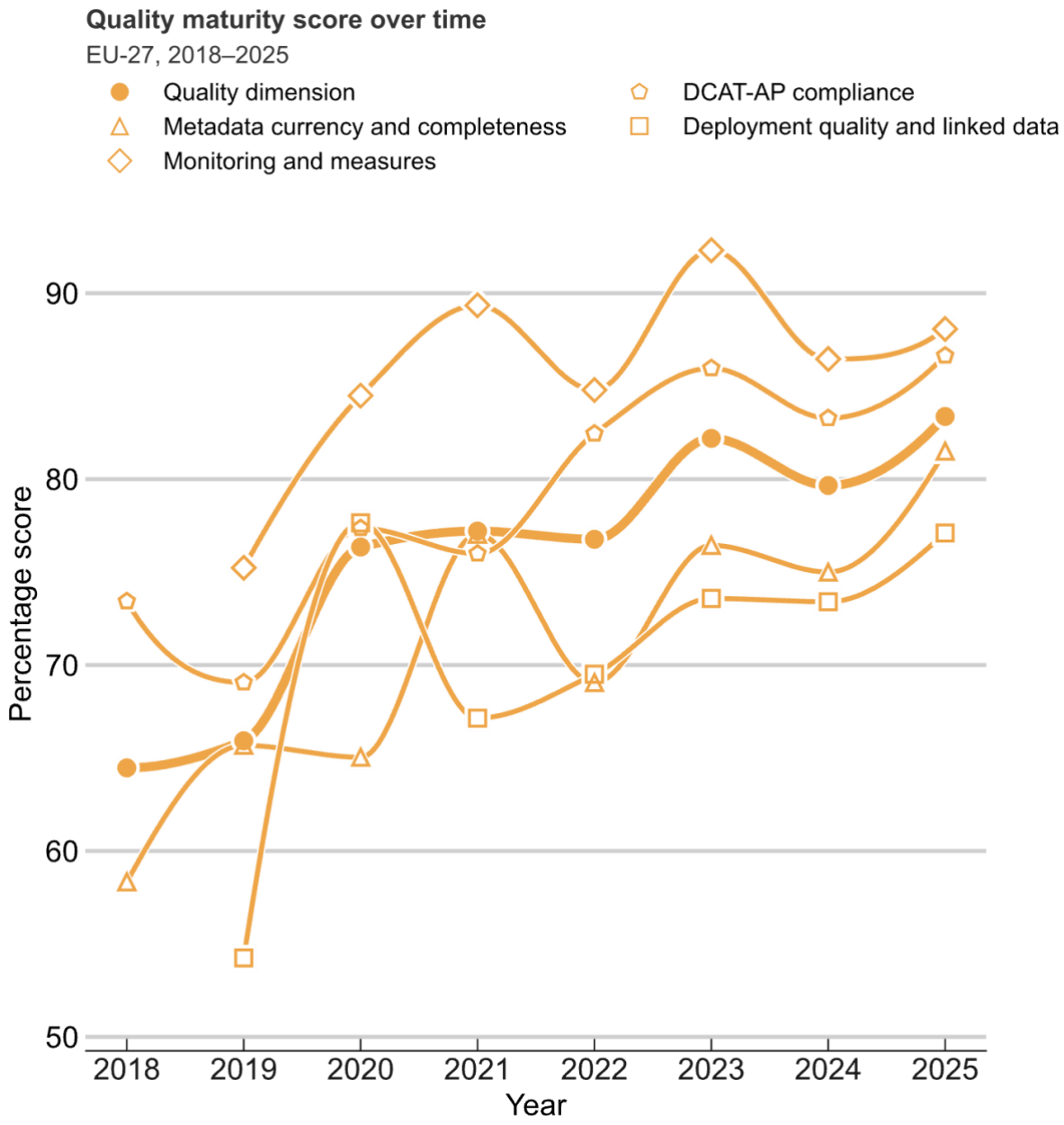

Figure 1: The EU-27 average score in the quality dimension experienced the largest year-on-year increase among the four dimensions.

France (100 %) maintains its position as the most mature country in the quality dimension (Figure 2*: The scores of the majority of countries increased in the quality dimension in 2025. NB: EFTA = European Free Trade Association, YoY = year on year.*

). **Latvia** (95 %) and **Ukraine** (94 %) hold second and third place.

Latvia and **Ukraine** both achieve full maturity (100 %) in the 'monitoring and measures' indicator, meaning they have strong mechanisms to check metadata quality and ensure correct licensing, along with support measures for data providers. Meanwhile, **Denmark**, **Lithuania** and **Ukraine** achieve full maturity (100 %) in the 'DCAT-AP compliance' indicator, demonstrating that they monitor adherence to the DCAT-AP standard and provide clear guidelines and training to help data providers comply.

Highlight from France – technical integration for DCAT-AP

One of the key challenges highlighted in this year's report for DCAT-AP compliance is technical integration from diverse systems.

France has taken extensive measures to guarantee that its national catalogue exposes correct DCAT-AP descriptions of datasets, particularly in the context of HVD reporting. The first approach involved leveraging the Semantic Interoperability Community (SEMIC) ISO 19139 to DCAT-AP Extensible Stylesheet Language Transformations (XSLT) as the main interoperability solution for harvesting metadata from decentralised or thematic geographical platforms. This required in-depth studies of common issues, such as licences, data services, contact points and other responsible parties, which were addressed either at the metadata level or during harvesting.

To ensure proper interpretation by the European Data Portal (data.europa.eu), France validated its DCAT-AP exposition using SPARQL (SPARQL Protocol and RDF Query Language), reporting endpoints to list required metadata fields. This process revealed inconsistencies in the national catalogue's exposition, which have since been corrected, strengthening compliance and interoperability.

This proactive approach demonstrates how systematic validation and iterative improvements can significantly enhance the accuracy and reliability of DCAT-AP metadata across national catalogues. Read more about this trend in **Section 6.4**.

Albania (+61 pp), **Malta** (+31 pp) and **Greece** (+16 pp) demonstrated the greatest year-on-year improvement in the quality dimension.

Albania's major improvement can be attributed to substantial progress in the 'DCAT-AP compliance' indicator (+100 pp), 'deployment quality and linked data' (+70 pp) and 'monitoring and measures' indicator (+66 pp). These substantial increases can be attributed to a comprehensive redevelopment of their open data portal over the past year.

Highlight from Albania – DCAT-AP by design

Albania achieved a marked improvement in DCAT-AP compliance by fully redeveloping its national open data portal. The new platform was designed using best practices from leading portals, notably the European Data Portal (data.europa.eu), and includes the following.

- **Structured metadata collection:** a redesigned management panel enables data providers to submit datasets via a user-friendly form that captures all required DCAT-AP fields. Metadata such as title, access rights, licence, format and publisher details are either mandatory or auto-inferred (e.g. media type, file size).
- **Automated metadata generation and validation:** upon submission, the system automatically generates DCAT-AP-compliant metadata. Validation is performed using a nationally developed metadata quality assurance (MQA) methodology, modelled on the MQA from the European Data Portal, to ensure consistency and conformance.
- **Legacy data migration:** all datasets from the previous portal were migrated and their metadata regenerated to align with DCAT-AP standards.

These initiatives led to Albania's open data portal achieving over 90 % compliance with DCAT-AP standards across mandatory, recommended and optional classes.

Read more about other countries' DCAT-AP compliance in Section 6.4.

Malta's increase in its score on the quality dimension can be attributed to its 48-pp increase in the 'DCAT-AP compliance' indicator, which they credit to a new version of their national portal that focuses more on DCAT-AP standards. Additionally, Malta saw a 32-pp increase in the 'metadata currency and completeness' indicator, which can be attributed to the implementation of DCAT-AP HVD tags, new efforts to ensure that published data covers a complete time series and an increase in the percentage of metadata obtained automatically from the source, among other improvements.

Highlight from Malta – guidance for high-quality metadata

One of the key practices highlighted in this year's report is the publication of manuals and handbooks that help data owners produce high-quality metadata.

Malta ensures that data publishers receive clear, practical guidance through multiple methods.

- **Helper text in the publishing form:** when creating or amending a dataset, data owners see a brief description under each metadata field, explaining what information is expected.
- **Publisher user guide:** a comprehensive guide is available to assist data owners in publishing datasets correctly and independently.

These measures enable data owners to provide accurate metadata and maintain consistency across the national portal.

Read more about this trend in Section 6.3.

Greece's increase in its score in the quality dimension can be attributed to its 30-pp increase in the 'deployment quality and linked data' indicator and an 18-pp increase in the 'DCAT-AP compliance' indicator. The notable rise in the 'deployment quality and linked data' indicator can be attributed to a new portal being implemented, which has improved the openness, structure and interoperability of its public datasets, along with its DCAT-AP compliance.

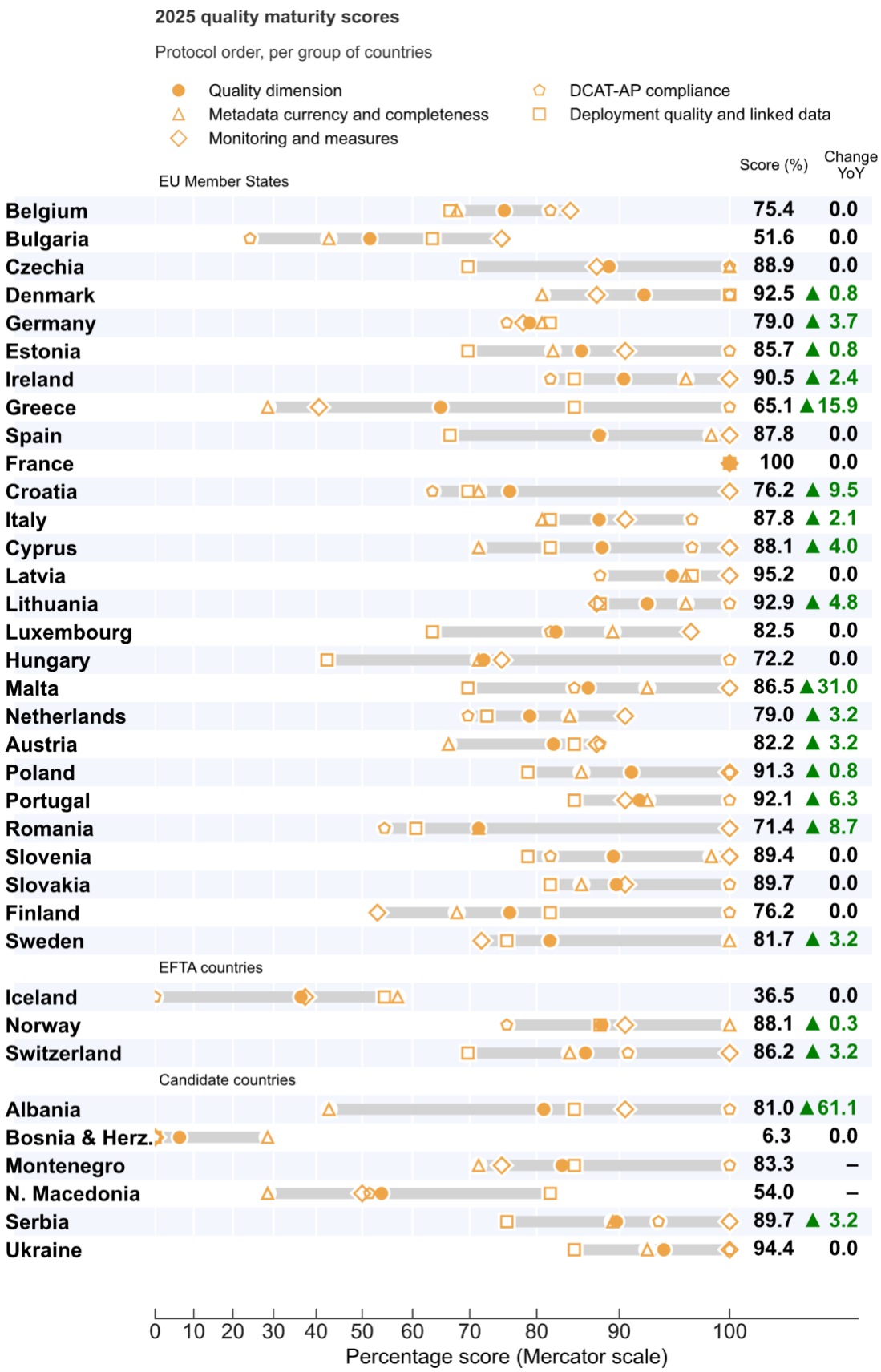

Figure 2: The scores of the majority of countries increased in the quality dimension in 2025.
NB: EFTA = European Free Trade Association, YoY = year on year.

6.2. Metadata currency and completeness

This indicator assesses the extent to which countries systematically ensure that their data and metadata are up to date. The indicator also investigates automatic harvesting processes, which ensure that changes at the data source are reflected with as little delay as possible on the portal where the dataset is made discoverable. Furthermore, the completeness of data that has a time component and preparations to ensure that HVDs are interoperable with other datasets on the portal are also evaluated by this indicator.

Currency of metadata

Metadata plays a crucial role in enhancing the usability and reliability of open data, and its timely update is essential for maintaining data relevance and accuracy. A predefined approach to ensuring that metadata remains up to date involves implementing systematic processes and mechanisms tailored to the specific characteristics and update frequency of different datasets. Table 2 presents an overview of how countries responded to the questions on this topic.

Table 2: Countries' responses to questions on the currency of metadata

	Is there a predefined approach to ensure that metadata is kept up to date?	*What percentage of the metadata on the national portal is obtained from the source automatically rather than edited manually?*	*What is the average delay from when the metadata describing a dataset is updated at the source to when the change is visible on the portal?*
EU-27	Twenty-six Member States (96 %), **all except Bulgaria**, report having a predefined approach to ensuring that metadata is kept up to date. This has remained stable since 2024.	Five Member States (19 %) report that 100 % of the metadata on their national portals is obtained automatically from the source. Seven Member States (26 %) indicate that at least 90 % of their metadata is sourced automatically, while five Member States (19 %) report that at least 70 % of their metadata is sourced automatically.	Twenty-one Member States (78 %), with the recent addition of **Croatia** and **Romania**, report that the average delay from when the metadata describing a dataset is updated at the source to when the change is visible on the portal is less than one day. Five Member States (19 %) indicate that this delay is typically less than one week. **Greece** reports that the average delay can extend beyond one month.
EFTA	All three participating EFTA countries report having a predefined approach to keeping metadata up to date. This has remained stable since 2024.	**Norway** reports that 100 % of its national portal is obtained automatically from the source. **Switzerland** reports that at least 90 % of the metadata on its national portal is obtained automatically	Like in 2024, **Norway** and **Switzerland** report that the average delay in updating metadata from the source is less than one day. **Iceland** reports that

	Is there a predefined approach to ensure that metadata is kept up to date?	*What percentage of the metadata on the national portal is obtained from the source automatically rather than edited manually?*	*What is the average delay from when the metadata describing a dataset is updated at the source to when the change is visible on the portal?*
		from the source. **Iceland** reports that this figure is less than 30 % of the metadata.	this delay can extend beyond one month.
Candidate	**Albania**, **Serbia** and **Ukraine** report having a predefined approach to keeping metadata up to date. This has remained stable since 2024.	**Ukraine** reports that at least 50 % of the metadata on its national portal is obtained automatically from the source. **Serbia** indicates that this figure is at least 30 %, while **Albania**, **Bosnia and Herzegovina**, **Montenegro and North Macedonia** report that less than 30 % is sourced automatically.	**Montenegro**, **North Macedonia**, **Serbia** and **Ukraine** report that the average delay in updating metadata from the source is less than one day. **Albania** and **Bosnia and Herzegovina** report that this delay can extend beyond one month.

(Questions Q1, Q2 and Q3)

Legal frameworks and regulatory requirements are frequently cited by countries such as **Estonia**, **Cyprus**, **Latvia** and **Slovenia** as the basis for their predefined approach to updating metadata. In many cases, designated open data personnel and portal administrators oversee quality by conducting regular checks and notifying publishers of discrepancies. By contrast, countries including **Greece**, **Lithuania**, **Serbia**, **Slovenia**, **Spain** and **Switzerland**, joined in 2025 by **Malta**, **Romania** and **Finland**, report that updates largely depend on data publishers, who determine the frequency for updating metadata.

In 2025, more countries report implementing DCAT-AP in their predefined approach for ensuring metadata is kept up to date. DCAT-AP provides a common metadata structure that includes properties for update information, such as last modification date and update frequency. While these fields are recommended or optional, their use supports better maintenance and interoperability of metadata across data portals. This standardisation enables automated validation, harvesting and synchronisation across portals, reducing manual effort and preventing out-of-date records. For example, the **Netherlands** reports implementing DCAT-AP-NL 3.0 with daily metadata checks and published validation guidance, and **Norway** recommends DCAT-AP nationally and supports harvesting to capture changes from local catalogues. Additionally, **Lithuania** has extended DCAT-AP to include temporal and spatial metadata types, enabling the system to identify and maintain coverage for these dimensions. While this does not inherently trigger automatic updates, it supports portal-level features such as automated checks and user notifications when datasets fall behind schedule.

Similar to the previous assessment, most countries rely on **automated harvesting systems** as a means to keep metadata up to date, often by utilising daily job schedulers. Some countries adopt a hybrid approach that combines automated harvesting with targeted manual checks, often for smaller data providers or to resolve discrepancies.

Completeness of metadata

Having complete and up-to-date data is important, since reuse cases may require historical or current data to be feasible and impactful. How current this data needs to be depends on what the data is about. Datasets that represent phenomena that change in real time, such as weather or traffic data, should be updated close to real time to enable complex applications. For other datasets, a different frequency of updates may be appropriate. Gaps in a time series can also negatively affect the usability of datasets. Table 3 presents an overview of how countries responded to the question on this topic.

Table 3: Countries' responses to the question on the completeness of metadata

	Do you undertake efforts to ensure that published data covers the full period from when it was first published?
EU-27	Twenty-three Member States (85 %) report undertaking efforts to ensure that published data covers the complete time series. **Malta**, **Romania** and **Sweden** are the most recent additions to this group.
EFTA	**Iceland** and **Norway** report undertaking efforts to ensure that published data covers the complete time series. This has remained stable since 2024.
Candidate	**Montenegro**, **Serbia** and **Ukraine** report undertaking efforts to ensure that published data covers the complete time series.

(Question Q4)

Regular monitoring, auditing and validation processes remain common methods to ensure that datasets cover the full time series. Countries such as **Bulgaria**, **Estonia**, **Hungary** and **Serbia** continue to report monitoring systems managed by portal editors or national teams, while **Luxembourg** actively engages with data producers to incorporate historical time-series data. Many countries also provide direct support and guidance to publishers to maintain data integrity across time periods. The use of the dcat:temporal attribute within the DCAT-AP standard, as noted by **Denmark** and **Slovakia**, remains an important practice to document temporal scope, especially when datasets are discontinued, and automation continues to be applied in some cases to prevent time gaps, as seen in **Latvia**, **Portugal** and **Slovakia.**

Building on these ongoing practices, in 2025 several enhancements were reported. Countries such as **Czechia**, **Germany**, **Lithuania** and **Sweden** adopted DCAT-AP 3.0 profiles and dataset series structures, making temporal coverage more systematic and reducing ambiguity in how time spans are represented. Automation now goes beyond updating datasets to include compliance nudges, such as **Lithuania's** automated notifications when updates are overdue. **Sweden** introduced functionality to assess metadata quality using the MQA method. Some countries have also introduced measures to improve historical completeness: **Lithuania** and **Romania** now explicitly encourage retrospective backfilling of historical data.

Interoperability of high-value datasets

The DCAT-AP annotation for HVDs can help denote HVDs, making it easier for users to identify and access them. Moreover, by adhering to this standard, national portals can ensure that their datasets are interoperable with those from other countries. Such interoperability is key to unlocking the full potential of the data, enabling more comprehensive analyses. By including the European Legislation Identifier (ELI) reference of the HVDs' Commission Implementing Regulation (EU) 2023/138 and the relevant HVD categories, portals can support automatic harvesting, grouping and meaningful

exploration of datasets. Table 4 presents an overview of how countries responded to the questions on this topic.

Table 4: Countries' responses to questions on the interoperability of HVDs

	Have you implemented the DCAT-AP HVDs tag to denote HVDs in your portal?	*Besides the DCAT-AP tag, have you implemented any other measures to ensure that HVDs are interoperable with datasets from other countries?*
EU-27	Twenty-one Member States (78 %) report that they have implemented the DCAT-AP HVDs tag in their (national) open data portal(s). **Malta**, the **Netherlands**, **Austria** and **Portugal** are recent additions to this group.	Twenty-two Member States (81 %), with the recent addition of **Germany**, report that they have implemented other measures to ensure that HVDs are interoperable with datasets from other countries.

(Questions Q5 and Q6)

NB: Non-EU countries were not surveyed on this question as Commission Implementing Regulation (EU) 2023/138 on HVDs applies only to Member States.

DCAT-AP for HVDs implementation continues to progress across Member States, building on developments that were already established. In 2025, more Member States continued to implement DCAT-AP for HVDs, with **Luxembourg**, **Malta**, the **Netherlands**, **Austria** and **Portugal** newly confirming their adoption of DCAT-AP HVD annotations. Beyond the continued expansion of HVD tagging, 2025 saw targeted improvements in how countries manage HVD tagging and related metadata practices. Several Member States enhanced visibility and discoverability of HVDs: **Lithuania**, **Luxembourg**, **Malta** and **Portugal** introduced or maintained filters and tags for HVD datasets, while **Sweden** added functionality to filter datasets by category and developed SPARQL queries to monitor HVD metadata. **Lithuania** also implemented automated update reminders through its 'Tasks' notification feature, supporting ongoing data maintenance. On the technical side, **Germany** adapted its geo-ISO converters and extended its Comprehensive Knowledge Archive Network (CKAN) to enable correct HVD handling and export, ensuring alignment with the European Data Portal.

In addition to using DCAT-AP HVD annotations, Member States continue to promote interoperability through measures such as direct coordination with data producers in other countries, encouraging standard licences and formats, and developing APIs (application programming interfaces). **Germany** and **Italy** upgraded their CKAN-based portals to improve metadata handling, while **Portugal** implemented DCAT-AP HVD tagging and exposed metadata through a dedicated catalogue endpoint. In addition, **Lithuania** and **Portugal** are applying EU concept schemes and tagging datasets with both HVD status, which indicates that a dataset is officially designated as an HVD under the EU Open Data Directive, and HVD category, which specifies the thematic area (e.g. Geospatial, Mobility or Earth Observation) based on the EU classification scheme, to ensure consistent classification across portals. In addition, DCAT-AP requires the dct:applicableLegislation property for HVDs, which must include the ELI reference to Commission Implementing Regulation (EU) 2023/138. This ensures that each dataset explicitly links to the legal act defining its HVD status.

6.3. Monitoring and measures

This indicator assesses the extent to which mechanisms are in place to evaluate and improve metadata quality and its compliance with licensing standards. Moreover, the indicator looks at the support, guidelines and tools available to assist data publishers in publishing high-quality metadata and choosing the correct licence type for their data.

Monitoring the quality of metadata on portals

Monitoring metadata quality is important for ensuring datasets are discoverable, well documented and usable by stakeholders. From manual reviews to automated systems, countries use a range of methods to ensure compliance with standards. Dashboards and reports are effective tools for monitoring and visualising metadata quality, and providing public access to these resources enhances transparency and accountability. Table 5 presents an overview of how countries responded to the questions on this topic.

Table 5: Countries' responses to questions on monitoring the quality of metadata

	Do you monitor the quality of the metadata available on your portal?	*Do you publish information on the quality of the metadata available on the portal?*
EU-27	Twenty-six Member States (96 %), **all except Finland**, report monitoring the quality of metadata available on their portals. This has remained stable since 2024.	Twenty-two Member States (81 %) report that they publish information on the quality of metadata available on their portals. This has remained stable since 2024.
EFTA	All three participating EFTA countries report monitoring the quality of metadata available on their portals. This has remained stable since 2024.	**Norway**, along with the recent addition of **Switzerland**, report publishing information regarding the quality of metadata available on their national portal.
Candidate	**Albania**, **Montenegro**, **Serbia** and **Ukraine** report monitoring the quality of metadata available on their portals.	**Ukraine**, along with the recent addition of **Albania** and **Serbia**, report publishing information on the quality of metadata available on their portal.

(Questions Q7 and Q8)

Countries continue to rely on automated systems to ensure metadata quality, but 2025 shows a shift towards more structured and enforceable approaches. **Spain** and **Switzerland's** portals have introduced formal validation mechanisms like shapes constraint language (SHACL)-based checks, while others, including **Latvia**, **Malta**, **Slovenia** and **Slovakia**, now apply gating rules that prevent publication of datasets with incomplete metadata. Publicly accessible metadata quality dashboards have also become more common, with **Albania**, **France**, **Serbia** and **Switzerland** being the most recent countries to openly provide such information to individuals. Furthermore, while manual reviews remain part of the process in some cases, the overall trend is towards automated validation combined with greater transparency.

Setting metadata standards and licensing requirements

Metadata serves as a foundational layer that describes the content, context and structure of datasets, enabling users to discover and utilise data effectively. Ensuring the quality of metadata is essential for fostering findability, interoperability and effective data sharing. Countries often set various standards and guidelines that organisations must implement to govern metadata quality and ensure the usability and reliability of open data. Licensing is a common way to govern open data and relevant metadata quality. Without a licence, data may be publicly available, but reusers will not have certainty about what permissions they have to access, use, change or share the data under copyright or database laws. Table 6 presents an overview of how countries responded to the questions on this topic.

Table 6: Countries' responses to questions on metadata standards and licensing requirements

	Do you set any standards on metadata quality that data providers must abide by?	*Do your open data publication or licensing guidelines recommend using CC licences?*	*What percentage of the open data available on the national portal is accompanied by licensing information?*	*How many different licences are used on your portal?*
EU-27	All Member States, with the recent addition of **Greece**, report that they set standards on metadata quality that data providers must abide by.	Like in 2024, 25 Member States (93 %), **all except Greece** and **Hungary**, report that their publication or licensing guidelines provide recommendations for using CC licences.	Twenty-two Member States (81 %) report that more than 90 % of their datasets have licensing information. This includes the most recent addition of **Croatia**.	Fifteen Member States (56 %) report having one to four licences on their portal. Only **Belgium**, **Czechia** and **Sweden** report having more than 10 licences on their portals.
EFTA	**Switzerland**, and the most recent addition of **Norway**, report that they set standards on metadata quality that data providers must abide by.	All three participating EFTA countries report that their publication or licensing guidelines provide recommendations for using CC licences. This has remained stable since 2024.	**Norway** and **Switzerland** report that over 90 % of their datasets have licensing information. This has remained stable since 2024.	**Iceland** and **Switzerland** report having one to four licences on their portal. **Norway** reports having between five to ten.
Candidate	**Albania**, **Montenegro**, **North Macedonia**, **Serbia** and **Ukraine** report that they set standards on metadata quality	**Albania**, **Montenegro**, **North Macedonia**, **Serbia** and **Ukraine** report that their publication or licensing guidelines provide	**Albania**, **North Macedonia**, **Montenegro**, **Serbia** and **Ukraine** report that more than 90 % of their datasets have licensing information.	**Montenegro**, **North Macedonia**, **Serbia** and **Ukraine** report having one to four licences on their portal. **Albania**

	that data providers must abide by.	recommendations for using CC licences.		reports having five to ten.

(Questions Q10, Q11, Q12 and Q13)

Many countries mandate the use of DCAT-AP, for example by stating that portals **must comply** with the specification or by defining mandatory fields in their national profiles. However, others such as **Ireland**, **Greece** and **Spain** emphasise compatibility rather than strict obligations, where DCAT-AP is framed as a benchmark for quality assessment or as part of an evolving standard (e.g., Spain's Technical Interoperability Standard for Reuse of Public Sector Information; NTI-RISP). **Cyprus** and **Luxembourg** enforce compliance through national profiles that extend DCAT-AP, which even go beyond the EU baseline by adding stricter or additional mandatory fields.

Countries also continue to mandate CC BY 4.0 or CC0 through strategies or laws, with this year's developments showing a move towards more formal legal instruments and operational enforcement in specific countries. For example, **Albania** and **Montenegro** now require the use of CC licences by law, with Albania specifically mandating CC BY 4.0.

Support activities for data providers

Activities to support data providers with publishing high-quality data can take many forms. Documents, tools, training and tailored guidance are common methods that countries use to ensure publishers supply high-quality datasets. Table 7 presents an overview of how countries responded to the questions on this topic.

Table 7: Countries' responses to questions on support for data providers

	Do you publish guidelines and have tools to assist publishers in publishing high-quality metadata?	*Besides providing guidelines, are regular activities conducted or mechanisms in place to assist publishers in supplying high-quality datasets?*
EU-27	Twenty-five Member States (93 %), with the recent addition of **Croatia** and **Malta**, report that they publish guidelines and have tools in place to assist publishers in publishing high-quality metadata.	Twenty-three Member States (85 %), with the recent addition of **Malta**, report that they conduct regular activities or have mechanisms in place to assist publishers in supplying high-quality datasets.
EFTA	**Norway** and **Switzerland** report that they publish guidelines and have tools in place to assist publishers in publishing high-quality metadata. This has remained stable since 2024.	**Norway** and **Switzerland** report that they conduct regular activities or have mechanisms in place to assist publishers in supplying high-quality datasets. This has remained stable since 2024.

	Do you publish guidelines and have tools to assist publishers in publishing high-quality metadata?	*Besides providing guidelines, are regular activities conducted or mechanisms in place to assist publishers in supplying high-quality datasets?*
Candidate	**Serbia**, **Ukraine** and the recent addition of **Albania** report that they publish guidelines and have tools to assist publishers in publishing high-quality metadata.	**Albania**, **Montenegro**, **Serbia** and **Ukraine** report that they conduct regular activities or have mechanisms in place to assist publishers in supplying high-quality datasets.

(Questions Q9 and Q14)

Countries continue to publish manuals and handbooks that include information on publishing high-quality metadata, with **Croatia** and **Malta** as the most recent additions.

Another continued trend in 2025 is the practice of providing tailored, direct assistance to data providers, helping them address specific challenges. This can be particularly effective because it allows for real-time feedback, clarification of standards and hands-on guidance, which can be more impactful than general documentation or training alone. For example, **France**, **Latvia**, **Poland** and **Romania** offer personalised help through one-on-one consultations. **Spain** expanded its efforts significantly, conducting over 700 support interactions with 159 organisations, while **Ukraine** implemented a moderation system that reviews datasets before they go live, complemented by a WhatsApp support channel for immediate assistance.

Several countries have also advanced their support for high-quality datasets and metadata publishing through more interactive and intelligent systems. Namely, **Malta** describes a foundational and interoperable data layer, including secure APIs, to help publishers access and share linked data. **France** redesigned its portal interface to offer contextual guidance, quality indicators and real-time feedback during dataset publication. **Lithuania** reports using a ranking system based on the 5-star open data model to motivate improvements in dataset quality. In addition, **Albania** and **France** are the newest countries to report utilising real-time metadata quality scoring tools, enabling publishers to assess and improve their metadata before publication.

Highlight from Albania – creating a management portal for data providers

Albania provides tools and functionalities to assist data publishers in ensuring high-quality metadata. They have implemented a dedicated management portal, available at https://admin.opendata.gov.al, where data providers can log in using their Entra ID credentials managed by the National Agency for Information Society.

Within this portal, the publishing module includes a simple and intuitive form that guides users through the process of entering dataset metadata. Key fields such as category, licence, media type and file type are either mandatory or controlled, helping to ensure consistency and compliance with DCAT-AP standards.

6.4. DCAT-AP compliance

DCAT is a World Wide Web Consortium standard designed to facilitate interoperability between data catalogues published online. DCAT-AP is an application profile of DCAT, developed by the European Commission to improve interoperability and foster the discoverability and reuse of open data across European catalogues. The 'DCAT-AP compliance' indicator assesses the extent to which metadata on national portals complies with the DCAT-AP standard for describing public sector datasets and what efforts are taken to assist data publishers in following DCAT-AP.

Creating a framework for DCAT-AP compliance

Having a standardised way to describe datasets helps ensure that data catalogues from different organisations or regions are interoperable. Consequently, many national portals adopt the DCAT-AP framework or align their standards with it to enable the seamless integration and exchange of metadata. Many countries have created national extensions of DCAT-AP to tailor the general framework to their specific needs, enhancing its relevance and functionality for their contexts. Table 8 presents an overview of how countries responded to the questions on this topic.

Table 8: Countries' responses to questions on creating a framework for DCAT-AP compliance

	Does the national portal follow the DCAT-AP framework or, if not, are standards in place to ensure interoperability with DCAT-AP?	*Is there a national extension of the DCAT-AP standard developed for your country?*
EU-27	Twenty-six Member States (96 %), **all except Bulgaria**, report that their national portals follow the DCAT-AP framework or ensure interoperability with DCAT-AP. **Greece** and **Malta** are the most recent additions to this group.	Seventeen Member States (63 %) report having a national extension of the DCAT-AP standard. **Luxembourg** and **Portugal** are the most recent additions to this group.
EFTA	**Norway** and **Switzerland** report that their national portals follow the DCAT-AP framework or ensure interoperability with DCAT-AP. This has remained stable since 2024.	**Norway** and **Switzerland** report having a national extension of the DCAT-AP standard. This has remained stable since 2024.
Candidate	**Albania**, **Montenegro**, **North Macedonia**, **Serbia** and **Ukraine** report that their national portals follow the DCAT-AP framework or ensure interoperability with DCAT-AP.	None of the participating candidate countries report having a national extension of the DCAT-AP standard. This has remained stable since 2024.

(Questions Q15 and Q19)

Countries continue to ensure DCAT-AP compliance by using platforms or plug-ins with built-in support for the standard. For example, **Montenegro** now uses the CKAN extension ckanext-dcat for their portal. Others maintain compliance by enforcing metadata structure and exporting metadata in DCAT format, a method now adopted by **Malta**, which uses Turtle syntax and mandatory fields in its portal. Legal and policy-based enforcement also remains a common approach, with **Romania** continuing this trend by mandating DCAT-AP through national legislation and preparing for the 3.0 update. Technical

enforcement through structured metadata requirements is further reflected in **Lithuania**, which uses an extended DCAT standard and requires valid metadata for publication.

Compliance with the DCAT-AP specifications

DCAT-AP has various metadata properties that can be used to describe data. As a specification, DCAT-AP defines a hierarchy of properties, grouped as classes, that are mandatory, recommended or optional. Table 9 presents an overview of how countries responded to the questions on this topic.

Table 9: Countries' responses to questions on compliance with DCAT-AP specifications

	What is the percentage of metadata on your portal that is DCAT-AP compliant in terms of mandatory classes?	*What is the percentage of metadata on your portal that uses DCAT-AP recommended classes?*	*What is the percentage of metadata on your portal that uses DCAT-AP optional classes?*
EU-27	Twenty-five Member States (93 %), with the recent addition of **Italy** and **Malta**, report that more than 90 % of their portals' metadata complies with DCAT-AP's mandatory classes.	Twenty-one Member States (78 %), with the most recent addition of **Italy**, report that more than 90 % of the metadata on their portals follows DCAT-AP's recommended classes.	Seventeen Member States (63 %), with the most recent addition of **Denmark**, report that more than 90 % of the metadata on their portals follows DCAT-AP's optional classes.
EFTA	**Norway** and **Switzerland** report that more than 90 % of the metadata on their portals is compliant with DCAT-AP's mandatory classes. This has remained stable since 2024.	**Norway** and **Switzerland** report that more than 90 % of the metadata on their portals follows DCAT-AP's recommended classes. This has remained stable since 2024.	**Switzerland** reports that at least 50 % of the metadata on its portal follows DCAT-AP's optional classes. For **Norway**, this percentage is at least 30 %, and for **Iceland**, it is less than 10 %. This has remained stable since 2024.
Candidate	**Albania**, **Montenegro**, **Serbia** and **Ukraine** report that more than 90 % of the metadata on their portals is compliant with DCAT-AP's mandatory classes.	**Albania**, **Montenegro** and **Ukraine** report that more than 90 % of the metadata on their portals follows DCAT-AP's recommended classes.	**Albania**, **Montenegro** and **Ukraine** report that more than 90 % of the metadata on their portals follows DCAT-AP's optional classes.

(Questions Q16, Q17 and Q18)

Investigating the common causes of non-compliance can help national portals to develop strategies to help data providers improve the quality of their metadata. Table 10 presents an overview of how countries responded to the question on this topic.

Table 10: Countries' responses to the question on non-compliance with the DCAT-AP standard

	Do you investigate the most common causes of the lack of DCAT-AP compliance?
EU-27	Twenty Member States (74 %), with **Malta** as the most recent addition, report investigating the most common causes of the lack of DCAT-AP compliance.
EFTA	**Switzerland**, and the most recent addition of **Norway**, report investigating the most common causes of the lack of DCAT-AP compliance.
Candidate	**Albania**, **Montenegro**, **Serbia** and **Ukraine** report investigating the most common causes of the lack of DCAT-AP compliance.

(Question Q20)

In 2025, a lack of training, awareness or expertise on the standard continues to be the most common cause of non-compliance with DCAT-AP. Countries such as **Malta**, **Montenegro**, and **Romania** are the most recent to cite that data owners and publishers often lack understanding of DCAT-AP requirements, leading to incomplete or incorrect metadata.

Outdated or unmanaged metadata also continues to be a significant barrier to DCAT-AP compliance. **France** and **Norway** specifically report that older dataset descriptions, created before DCAT-AP standards were widely adopted or understood, have not been properly updated. These legacy records often lack mandatory properties or use incorrect ones, contributing to persistent non-compliance.

The complexity of technical integration from diverse systems also remains a recurring cause of non-compliance. In 2025, **France** highlights a more nuanced aspect of technical integration: the difficulty of ensuring DCAT-AP compliance when harvesting metadata from decentralised platforms. Even when platforms support DCAT-AP, inconsistencies in implementation and exposure methods (e.g. SPARQL endpoints, XSLT) can lead to non-compliant metadata being ingested into national catalogues. This reflects a growing complexity in maintaining metadata quality across distributed systems.

6.5. Deployment quality and linked data

This indicator examines the extent to which countries use a model, such as the Berners-Lee 5-star open data model or the FAIR principles, to assess the quality of data deployment. This indicator also assesses the extent to which data is available under an open licence, in structured and machine-readable formats, with URIs and links to other data sources.

Use of models for deployment quality

A model for assessing data deployment is important because it enables national portal teams to systematically and adaptively judge whether a dataset is more or less likely to be reused, given the quality it offers portal users. Table 11 presents an overview of how countries responded to the question on this topic.

Table 11: Countries' responses to the question on the use of models for deployment quality

	Do you use a model to assess the quality of deployment of data in your country?
EU-27	Twenty-four Member States (89 %), **all except Bulgaria**, **Hungary** and the **Netherlands**, report using a model to assess the quality of deployment of data. This has remained stable since 2024.
EFTA	All participating EFTA countries report using a model to assess the quality of deployment of data. This has remained stable since 2024.
Candidate	**Albania**, **Montenegro**, **North Macedonia**, **Serbia** and **Ukraine** report using a model to assess the quality of deployment of data.

(Question Q23)

The 5-star open data model and the FAIR principles remain the most frequently cited models used by countries for assessing data quality. **Albania** and **Montenegro** are the most recent countries to adopt the 5-star open data model to assess the quality and deployment of open data in their respective countries. Many countries continue to integrate the FAIR principles into their data quality assessments.

Highlight from France – data.gouv.fr metadata quality score

France has developed a metadata quality score for datasets published on data.gouv.fr, inspired by the 5-star open data model. This score is designed to help both data producers and reusers assess and improve the quality of metadata in a transparent and actionable way.
 	
Key features include the following.
• **Multi-criteria evaluation**: the score is based on several metadata dimensions, including:
  ○ completeness and clarity of dataset descriptions;
  ○ documentation of resources;
  ○ update frequency and adherence;
  ○ licensing openness;
  ○ declared open formats;
  ○ spatial and temporal coverage.
• **User guidance**: producers receive feedback on which criteria are met and which need improvement, encouraging continual enhancement of metadata quality.
• **Integration into impact indicators**: the score is publicly visible and integrated into France's broader impact measurement framework, reinforcing metadata quality as a key performance metric.
 	
This model promotes greater accountability, discoverability and reuse potential of datasets, while offering a replicable framework for other countries aiming to improve metadata quality systematically.

Activities for data providers to ensure high-quality data

The quality of data on national portals depends on the quality of data supplied by data providers. Therefore, assisting data providers with skills and tools is one way to improve the quality of published data. Table 12 presents an overview of how countries responded to the question on this topic.

Table 12: Countries' responses to the question on activities for data providers to ensure high-quality data

	Do you conduct activities to promote and familiarise data providers with ways to ensure higher quality data?
EU-27	Twenty-six Member States (96 %), **all except Bulgaria**, report conducting activities to promote and familiarise data providers with ways to ensure higher quality data. This has remained stable since 2024.
EFTA	All participating EFTA countries report conducting activities to promote and familiarise data providers with ways to ensure higher quality data. This has remained stable since 2024.
Candidate	**Albania**, **Montenegro**, **Serbia** and **Ukraine** report conducting activities to promote and familiarise data providers with ways to ensure higher quality data.

(Question Q24)

In 2025, countries continue to echo trends from previous assessments in the type of activities used to promote and familiarise data providers with ways to ensure higher quality data. Namely, **Albania** and **Montenegro** now report organising hands-on or thematic training events. Specifically, **Albania**

organised a hands-on workshop led by the National Agency for Information Society, focusing on improving metadata structure and standardisation. **Montenegro** conducted training sessions that emphasised the importance of data quality and provided internal guidance documents to support data providers. **Norway** is also another country to report the trend of direct engagement with data publishers, where authorities proactively reach out to data providers with tips and feedback to improve metadata quality. Notably, **France** reported a more comprehensive approach to familiarise data providers with ensuring higher quality data, which includes regular training events, webinars and personalised support, complemented by detailed documentation and feedback mechanisms based on user analytics.

Highlight from France – promoting data quality through schema adoption
France places strong emphasis on promoting the use of standardised data schemas to enhance metadata quality and interoperability across its open data ecosystem. To support this, it maintains a dedicated platform – schema.data.gouv.fr – that provides comprehensive documentation, validation tools and practical examples. This platform helps data providers adopt common schemas, validate their datasets and ensure consistency in structure and semantics. By making schema adoption accessible and actionable, France empowers publishers to produce higher quality, interoperable data that is easier to discover, integrate and reuse.

Deployment quality

Several best practices can enhance the accessibility and reusability of open data. These include ensuring datasets are made available under an open data licence (e.g. CC) and having licences provided in a structured format. Additionally, it is good practice to ensure that datasets are in an open and machine-readable format (e.g. CSV, JSON and XML) and to assign URIs to the datasets. Finally, datasets should also be linked to various sources, which, through the use of URIs, can expand the dataset's context and relevance. Table 13 presents an overview of how countries responded to the questions on this topic.

Table 13: Countries' responses to questions on deployment quality

	*What percentage of datasets are made available under an **open licence**?*	*What percentage of licences are provided in a **structured data format**?*	*What percentage of datasets are provided in an open and **machine-readable format**?*	*What percentage of datasets use **URIs**?*	*What percentage of datasets **link to other sources**?*
EU-27	Twenty-four Member States (89 %), with the recent addition of **Greece** and **Portugal**, report that	Twenty-three Member States (85 %) report that over 90 % of their datasets have structured licence data. This includes	Seventeen Member States (63 %), with the recent addition of **Greece**, report that over 90 % of their datasets are in	Eleven Member States (41 %) report that over 90 % of their datasets use URIs. This includes the recent	Five Member States (19 %) report that over 90 % of their datasets are linked to other sources. This has remained

	over 90 % of their datasets have an open licence.	the recent additions of **Ireland**, **Greece**, **Malta** and **Portugal**.	a machine-readable format.	additions of **Greece**, **Cyprus** and **Lithuania**.	stable since 2024.
EFTA	**Switzerland** reports that over 90 % of its datasets have an open licence. This has remained stable since 2024.	All three participating EFTA countries report that over 90 % of their datasets have structured licence data. This has remained stable since 2024.	**Iceland** and **Norway** report that over 90 % of their datasets are in a machine-readable format. This has remained stable since 2024.	**Norway** reports that over 90 % of its datasets use URIs. This has remained stable since 2024.	**Norway** reports that over 90 % of its datasets are linked to other sources. This has remained stable since 2024.
Candidate	**Albania**, **Montenegro**, **North Macedonia**, **Serbia** and **Ukraine** report that over 90 % of their datasets have an open licence.	**Albania**, **Montenegro**, **North Macedonia**, and **Serbia** report that over 90 % of their datasets have structured licence data.	**Albania**, **Montenegro**, **North Macedonia**, **Serbia** and **Ukraine** report that over 90 % of their datasets are in a machine-readable format.	**Albania**, **Montenegro**, and **North Macedonia** report that over 90 % of their datasets use URIs.	**North Macedonia** and **Ukraine** report that between 51 % and 70 % of their datasets are linked to other sources.

(Questions Q25, Q26, Q27, Q28 and Q29)

6.6. Pilot indicator: automated tests of metadata quality

Pilot indicator – automated tests

In addition to gathering qualitative data about metadata quality, metadata quality can also be assessed quantitatively. The MQA is a tool designed to evaluate the quality of metadata harvested by the European Data Portal. More information about the methodology and its calculations can be found on the MQA page of the European Data Portal.

In brief, the MQA's methodology examines five dimensions, which focus on:

- compliance with DCAT-AP and related standards;
- the disclosure of information beyond DCAT-AP requirements;
- the accessibility of referenced data;
- the machine readability of data formats;
- the use of licences.

As a pilot project in the ODM assessment, four specific indicators from the MQA were analysed. Summary statistics were calculated across national catalogues that were findable on the European Data Portal. Certain countries, including **Albania**, **Bosnia and Herzegovina**, **Malta** and **North Macedonia**, were not assessed as their primary open data catalogues were not findable on the European Data Portal. Geoportals are not included in the analysis. The metrics were extracted from the MQA on 28 November 2025. The findings did not contribute to the countries' maturity scores.

The **machine readability** indicator evaluates if a distribution is in a machine-readable format based on the European Data Portal's GitLab repository vocabulary.

- 33 % of the distributions assessed are machine readable.

The **DCAT-AP compliance** indicator evaluates metadata conformity with the DCAT-AP standard using the SHACL validation from the European Data Portal. SHACL is a recommendation from the World Wide Web Consortium and is used for validating RDF graphs against a set of shapes. A limitation of the MQA methodology is that this DCAT-AP check can only be performed in catalogues that are delivered natively as RDF.

- 26 % of the distributions assessed are DCAT-AP compliant, with **Italy** scoring 100 % on this indicator.

The **licence information** indicator evaluates if distributions specify licence details, facilitating reuse.

- 54 % of the distributions assessed provide licence information, with **Cyprus**, **Czechia**, **Germany**, **Iceland**, **Italy**, **Luxembourg**, the **Netherlands**, **Spain** and **Switzerland** achieving 100 % on this indicator.

The **licence vocabulary** indicator evaluates the accuracy of licence specifications (e.g. correctly versioned CC licences). The specifications are derived from the FAIR principles. The MQA recommends and credits the usage of controlled vocabularies. The European Data Portal publishes its controlled vocabularies on GitLab. The vocabularies are derived from the EU vocabularies.

- 15 % of the distributions assessed include licence information that matches controlled vocabularies, with **Cyprus** scoring 100 % on this indicator.

6.7. Recommendations

Countries can use the following general advice to improve the quality dimension of the ODM methodology. The recommendations are tailored to four nominal levels of maturity, ranging from trendsetters to beginners.

Trendsetters

- Lead by example in improving data and metadata quality by applying domain-specific standards to harmonise datasets and ensuring that HVDs fully comply with both metadata and data requirements. Apply the same approach to other datasets of significant value to maximise interoperability, discoverability and reusability.
- Continue to improve the quality of data and its metadata by boosting the use of tools on your portal (e.g. for metadata validation). Explore the use of tools powered by artificial intelligence to improve metadata quality. Enable automated notifications to publishers to alert them to issues.
- Provide tools to convert data into alternative formats, possibly replacing non-machine-readable, proprietary formats.

Fast-trackers

- Enforce minimum standards on the quality of data by using analytics tools to monitor data publication – for both metadata (compliance with DCAT-AP) and data (publication formats).
- Develop validation processes for your national portal and report back to data providers. Act on the findings and provide tailored assistance to publishers to increase the quality of publication of both metadata and data.
- Explore the use of tools powered by artificial intelligence to improve metadata quality and automate the detection of issues.

Followers

- Provide training and online materials focusing on metadata and data quality. Promote the DCAT-AP standard and the use of its controlled vocabularies and existing guidelines to foster compliance.
- Create an understanding of the importance of publishing data in machine-readable, non-proprietary formats and of the licensing of data.
- Develop knowledge around existing open-source tools for cleaning up data, specifically the use of validators for metadata compliance.

Beginners

- Start by applying established standards and reusing existing guidelines and approaches from the European level.
- Promote the use of DCAT-AP for metadata and standard licences such as CC BY for data.
- Learn from European best practices, for example those collected in the ODM assessment, and reach out to colleagues in other countries, especially when setting out to create such guidelines.

data.europa.eu
The official portal for European data

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