

2023 Open Data Best Practices in Europe

Portugal, Serbia and Slovakia share their strategies to achieve greater open data maturity

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1. Key insights from Portugal, Serbia and Slovakia

In the 2023 open data maturity (ODM) assessment, **Portugal**, **Serbia** and **Slovakia** achieved significant year-on-year improvements in their ODM. This current report on open data best practices investigates the drivers behind this growth through interviews with the open data teams of these three countries.

Figure 1 summarises some key insights from these interviews.



Figure 1: Key insights from the open data teams of Portugal, Serbia and Slovakia

Indeed, the open data teams reflect that they, too, identify best practices from others and adapt them to their own contexts. Open data policies and strategies are highlighted as foundational aspects in achieving high maturity since these create a platform for ambitious measures. Plans must be supported by awareness-raising activities that communicate the importance of open data to relevant

stakeholders and create a community of enthusiasts that drive initiatives forward. Often, targeted projects such as portal improvements or impact measurements can help accelerate maturity. Continuity in the core team can also help maintain momentum with open data initiatives.

This report is structured along the four dimensions of ODM – policy, impact, portal and quality – and distils several best practices for each topic that other countries can use as a source of inspiration and guidance when developing their own strategies and plans to advance in the field of open data.

2. Introduction

The ODM assessment is a benchmarking exercise that evaluates countries' maturity in the field of open data. It measures European countries' progress in making public sector information available and encouraging its reuse in accordance with the open data directive (Directive (EU) 2019/1024). In 2023, 35 countries participated in the assessment ⁽¹⁾, including the 27 EU Member States, three European Free Trade Association countries (Iceland, Norway and Switzerland) and five candidate countries (Bosnia and Herzegovina, Montenegro, Albania, Serbia and Ukraine).

The ODM assessment conceptualises open data maturity in four dimensions.

- **Policy** investigates the open data policies and strategies in place in the participating countries, the national governance models for managing open data and the measures applied to implement those policies and strategies.
- **Impact** analyses the willingness, preparedness and ability of countries to measure both the reuse of open data and the impact created through this reuse.
- **Portal** investigates the functionality of national open data portals, the extent to which users' needs and behaviours are examined in order to improve the portal, the availability of open data across different domains and the approach to ensuring the portal's sustainability.
- **Quality** assesses the measures adopted by portal managers to ensure the systematic harvesting of metadata, the monitoring of metadata quality and compliance with the data catalogue vocabulary application profile (DCAT-AP) metadata standard, and the quality of deployment of the published data on the national portal.

The 2023 ODM assessment identified **Portugal** (+ 10 points), **Serbia** (+ 10 points) and **Slovakia** (+ 32 points) as some of the fastest-growing participants last year based on overall maturity (Figure 2). This report on open data best practices aims to understand the drivers behind this growth to facilitate the sharing of best practices and formulate recommendations that may be beneficial for countries seeking to enhance their ODM.

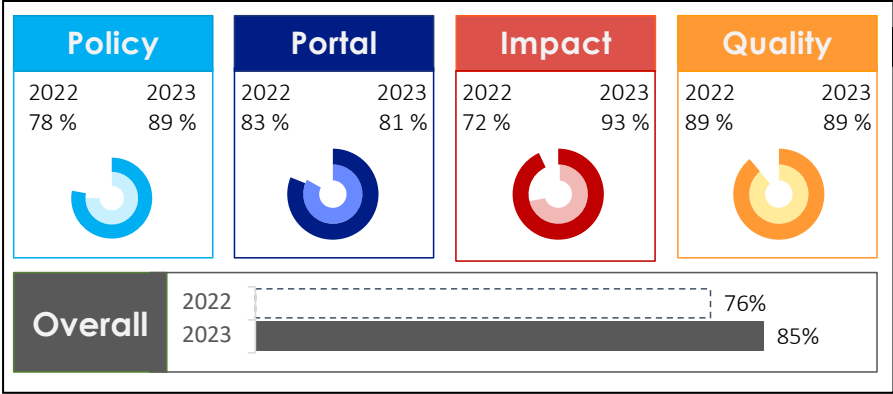
This report first outlines the method used to gather the open data best practices from these fast-growing countries and then analyses the prevalent trends and insights for each dimension of maturity. Each section concludes by highlighting key takeaways and actionable recommendations aimed at fostering improvements in open data practices.

⁽¹⁾ https://data.europa.eu/sites/default/files/odm2023_report.pdf.

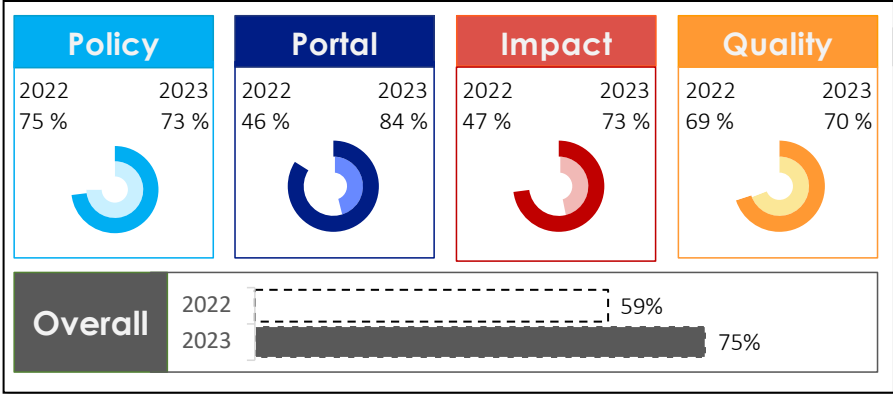
Change in maturity score across the open data dimensions of Portugal, Serbia and Slovakia

2022–2023

PORTUGAL



SERBIA



SLOVAKIA

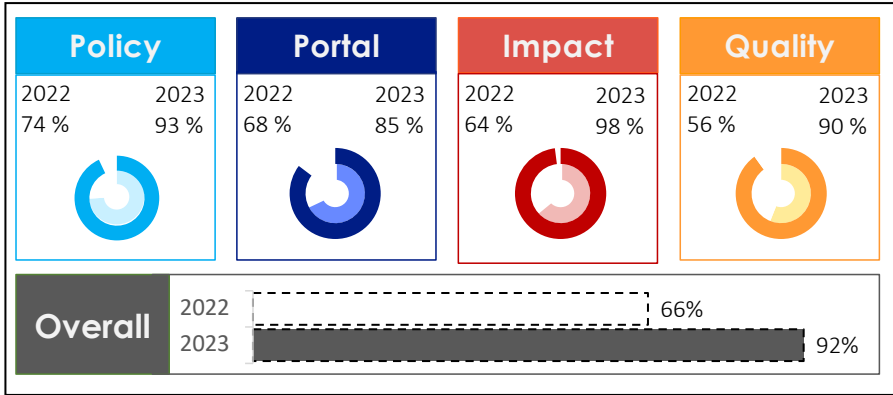


Figure 2: Portugal, Serbia and Slovakia showed accelerated ODM in several dimensions, making them fast growers in overall maturity in the 2023 ODM assessment

3. Method for data collection

A questionnaire was sent to the open data representatives of **Portugal, Serbia and Slovakia** that asked them to answer several questions as if they were in an advisory position, explaining what open data practices have worked well in their national contexts that other countries could potentially transpose to their own. The questionnaire asked some tailored questions about open data practices and then focused on the same three issues for each of the four dimensions: (1) reasons for your country's good performance; (2) areas for improvement; and (3) selected best practices. The responses are synthesised in this report.

4. The policy dimension

The **policy dimension** is designed to encourage the practical implementation of policy measures. It investigates the maturity of national policies by assessing (1) the policy framework – that open data policies and strategies are in place to incentivise open data reuse in both the public and private sectors; (2) the governance of open data – that governance models and regular coordination activities are in place to ensure the publication of open data at all government levels and support local and regional open data initiatives; and (3) open data implementation – the extent to which data publication plans, implementing processes and monitoring measures are in place to enable open data initiatives.

Broadly speaking, open data policies encompass a framework of regulations, legal statutes, directives and guidelines implemented by governments to increase the accessibility and dissemination of public sector data. The overarching aim of such policies is to reduce obstacles to accessing data, encourage data reuse and foster innovation by granting citizens, enterprises, scholars and other entities the ability to use the data for different objectives. The open data directive, which had to be transposed into national law by July 2021, established the framework for open data policy in the EU. The directive also introduced the concept of high-value datasets (HVDs), which are public datasets associated with important socioeconomic benefits for society, the environment and the economy. An implementing regulation (Commission Implementing Regulation (EU) 2023/138) was published in January 2023 that sets out requirements for six categories of datasets designed to be of high value.

This section summarises several best practices related to open data policies and their implementation.

Raise awareness as a key precursor to successful policy implementation

The three countries point to similar measures to ensure smooth cooperation among the different stakeholders. **Awareness initiatives focused on public agents in various contexts and formats**, such as webinars, conferences, meetings and work meetings, are crucial to highlighting the socioeconomic value of open data and enhancing transparency. **Enhancing the alignment of stakeholders in the field facilitates the approval of forward-looking open data legislation.**

In line with this, the representatives from **Portugal** reflect on the importance of **advocating for an open data culture at all levels, aimed at promoting an environment of openness within government agencies**. In its view, the national data strategy and the data strategy for public administration are two instruments whose dissemination can motivate a set of essential changes for the realisation of various objectives in open data. For example, they can create the conditions for defining practices, responsibilities and connections between entities with a view to establishing data governance mechanisms in some areas, essential to ensuring data quality and openness.

Have strong national policies that influence the implementation and reuse of open data

The reasons for Portugal, Serbia and Slovakia's improved performance in the policy dimension are diverse. Nonetheless, the representatives from the three countries who were interviewed underscore the critical role of robust national policies in influencing the implementation and reuse of open data. **A legislative backbone is crucial to fostering a culture of open data and incentivising the reuse of datasets.**

For instance, **Portugal** emphasises the efficacy of national legislation, citing its law ⁽²⁾ approved in August 2021 that transposes the European open data directive into national legislation. The law focuses on data available for reuse, including dynamic data and real-time data, and outlines specific requirements for HVDs (e.g. made available using APIs with accessible quality metadata). The law also reinforces the role of the central open data portal as the repository of these datasets ⁽³⁾.

Similarly, **Serbia** reports taking a significant step forward with the adoption of the new programme for e-government (2023–2025) ⁽⁴⁾, enhancing the country's commitment to advancing open data initiatives. Finally, **Slovakia** started activities towards implementing the HVD regulation, implemented a wiki on open data and reviewed its legislative landscape on the reuse of data. The country underscores the importance of **defining and regularly updating open data policies, ensuring detailed guidance for open data providers and appointing data stewards within key government bodies.**

Create a governance framework that involves a diverse set of stakeholders

Serbia indicates that having a diverse governance framework has been a cornerstone of its success. On the one hand, the establishment of the Open Data Working Group exemplifies this approach, bringing together stakeholders from various sectors to **foster collaboration and coordination**. The country has also invested in initiatives like the Open Data Week, which aims at involving previously marginalised groups and enhancing the impact of open data.

Moreover, the Office for IT and eGovernment, alongside experts from the Open Data Hub ⁽⁵⁾, offers **tailored support free of charge**, facilitating the publication of new open datasets and inspiring innovative reuse cases. The Open Data Hub acts as a centralised resource for everyone involved in Serbia's open data network, including individuals, start-ups, companies, experts, institutions, media and the civil sector. It provides assistance in accessing and utilising open data and related procedures. The hub was established as a component of the open data initiative, which began in Serbia in 2015. Overall, **a broad governance framework that involves a diverse set of actors is crucial to boosting engagement in the field and fostering a welcoming legislative environment.**

5. The impact dimension

The **impact dimension** of the ODM assessment is designed to encourage open data teams to implement mechanisms to monitor open data reuse in their countries and undertake efforts to better understand and cater to reusers' needs. It investigates the maturity of such mechanisms and activities by assessing (1) strategic awareness – the presence of mechanisms to foster and monitor open data reuse; (2) the measuring of reuse – the availability of tools to understand which datasets are reused

⁽²⁾ <https://diariodarepublica.pt/dr/detalhe/lei/68-2021-170221042>.

⁽³⁾ https://dados.gov.pt/en/docs/about_dadosgov/.

⁽⁴⁾ The legal basis for the adoption of the [e-government development programme](#) is set out in Articles 14 and 38 of the Law on the Planning System of the Republic of Serbia (*Official Gazette of the Republic of Serbia*, No 30/18).

⁽⁵⁾ <https://hub.data.gov.rs/en/home/#:~:text=Open%20Data%20Hub%20is%20a,open%20data%20and%20ancillary%20processes>.

and how; and (3) created impact – the existence of reuse cases demonstrating uptake of open data for new purposes across political, social, environmental and economic domains.

This section summarises several best practices related to measuring and encouraging open data reuse.

Benchmark existing practices that measure the impact of open data

Portugal has attributed its enhanced performance in measuring the impact of open data to the execution of a **dedicated project that benchmarked and analysed existing methodologies for impact assessment**, laying the foundation for a structured approach to impact measurement. A key aspect of this project has been the active involvement of both public and private partners in gathering information on what is currently being done at the national level to measure the impact of open data. **This collaborative effort has ensured a comprehensive understanding of current practices and challenges surrounding the measurement of open data's impact.** Moreover, this project has played a pivotal role in equipping Portugal with the necessary insights to effectively respond to the ODM assessment.

Slovakia has also launched an initiative to assess the impact of open data. The country has joined the 2022–2024 open government partnership (OGP) national action plan. All OGP governments sign up to the Open Government Declaration ⁽⁶⁾ and are required to work with civil society organisations to co-create reforms as part of an action plan that can deliver real benefits to citizens. Slovakia's participation in the OGP has enabled the inclusion of a specific section in the action plan focused on analysing the impact of open data on selected societal aspects. This has allowed Slovakia to evaluate the current status and future directions of open data initiatives, contributing to the advancement of its open data agenda.

Nonetheless, the three countries mention the difficulty of assessing the impact of open data. In general, they identify that a methodology that allows countries to quantitatively measure the impact of open data and effectively monitor the reuse of datasets is currently lacking. There is a need to comprehensively identify reuse cases and enhance the measurement techniques for open data reuse and impact.

Go beyond the open data portal to gather reuse cases

The three countries mention showcasing reuse cases on their official open data portals. **Portugal** mentions fostering **collaborations with civil society and academic institutions to document reuse cases systematically.** During dissemination and awareness-raising activities for open data, Portugal places a strong emphasis on the message that reuse cases serve as a proxy for and, in some cases, a direct measurement of the impact of open data.

Serbia also has a dedicated reuse section on its open data portal that offers an overview of reuse cases. **Engagement efforts through the Open Data Working Group and social media campaigns** help encourage further submissions of reuse cases and inspire the wider audience of open data users. Serbia has additionally highlighted **running initiatives such as the data innovation challenges, where participants are provided resources to create new reuse cases**, and then those reuse cases are shared to encourage further open data reuse.

Slovakia similarly employs a proactive approach, conducting **interviews with open data reusers and organising workshops focused on reuse cases** to foster a culture of collaboration and innovation.

⁽⁶⁾ <https://www.opengovpartnership.org/process/joining-ogp/open-government-declaration/>.

Increase the quality and usability of open data

Slovakia points out that reusers want to work with high-quality data. Therefore, increasing the quality and usability of open data is a precondition to stimulating reuse and seeing an impact created by it.

6. The portal dimension

The **portal dimension** of the ODM assessment encourages national open data portals to provide users with features and functionalities that meet their needs and offer a good user experience. It investigates the maturity of national portals by assessing (1) portal features – the functionalities enabling users to access open data via national portals and the features facilitating interaction between publishers and reusers; (2) portal usage – the use of web analytics to comprehend user needs and behaviours; (3) data provision – the extent of open data coverage provided by the portal; and (4) portal sustainability – the measures implemented to promote the portal to its target audience.

Open data portals ⁽⁷⁾ are platforms designed to streamline access to and use of data. They function as central hubs for users to find and make use of cross-border data from national, regional or local entities that are linked to their original sources. Enhancing the user interface of these portals and making data easy to find is essential in fostering data reuse and harnessing the full power of open data.

This section summarises several best practices related to open data portals and their functionalities.

Continuously update the national open data portal based on new technologies, user feedback and lessons from other countries

All three countries emphasise the need to continuously update their portals to serve users. **Portugal** highlights that **updating the uData platform, the foundation technology of the portal, has significantly improved existing functionalities and has introduced new ones**. For example, tools for monitoring the individual quality of datasets increase credibility and enable quick decision-making by users of a particular dataset. They decide what portal functionality to invest in and launch for their users by aligning the needs of functionalities with their future vision for the portal. Other features, such as portal security, need to be implemented over time to mitigate emerging risks. Portugal reflects that, in future, it could make better use of portal usage statistics to analyse user demographics and behaviours to grasp their evolving needs and expectations.

Serbia commits to continuously refining its portal by **actively listening to and addressing the needs of its users**, for example through the Open Data Working Group. The group comprises a diverse array of stakeholders, including public servants, NGO representatives, media professionals, academics, technologists and enthusiastic advocates of open data. Based on user feedback, Serbia has implemented a series of enhancements to improve user experience and functionalities, such as refining navigation to bolster search capabilities and optimising data visualisation tools. In addition to gathering community feedback, Serbia has conducted comprehensive desktop **reviews of open data portals from other countries considered relevant and exemplary in this domain**. Specifically focusing on portals with high scores in the ODM index, it seeks inspiration from these leading examples. The open data team is also exploring opportunities to collaborate with the French open data team, the architects behind uData, to foster knowledge exchange and innovation within the open data community.

(7) <https://digital-strategy.ec.europa.eu/en/policies/open-data-portals>.

Slovakia has modernised its portal, **transitioning from the Comprehensive Knowledge Archive Network (CKAN) to a technology infrastructure that better supports DCAT**. By leveraging LinkedPipes, an open-source platform for linked data, and adopting a portal architecture from the Czech national portal, Slovakia has created **a new open data portal**. It has also made its back-end and front-end ⁽⁸⁾ code available on GitHub repositories to promote transparency and encourage collaboration. The team is now creating guidelines for implementing new open data portals, documented through repositories like the *nkod-pipeline* and the *nkod-portal*, as a resource for other countries seeking to modernise their open data infrastructure.

Use the portal to enhance community engagement and offer interactive channels of communication

With the aim of ensuring its portal is a facilitator of open data reuse, **Portugal** has developed a more efficient interaction channel between the community and data providers. Portugal notes it can be challenging to ensure the quality of datasets on the portal since dataset quality relies heavily on the actions of data providers. **By working closely with the data providers and creating channels for reusers to communicate with the data providers directly, the open data team strives to maintain a high level of dataset quality** and ensure the success of the portal. There is more that Portugal wants to implement in future to continue to improve the interaction with the open data community. For example, it wants to bolster engagement with the community through more dissemination events and by enriching the portal's news and content channels to encompass topics of broader interest.

Serbia's open data portal similarly **facilitates direct communication between data providers and portal users**. This feature enables data providers to receive concrete feedback and actionable advice based on users' first-hand experiences. Serbia reports that this iterative feedback loop drives continuous improvement and fosters a culture of transparency, accountability and user-centric design within the country's open data ecosystem. In addition, Serbia places a strong emphasis on storytelling and community engagement through its Open Data Hub ⁽⁹⁾. The hub provides a **dedicated space for the community to explore data resources and engage with other reusers**. In an effort to improve usability and maximise the value of open data offerings, Serbia has developed new features, such as the ability to open discussions for each dataset. Such features also provide insights into user behaviour, preferences and challenges, empowering the optimisation of data usability and user experience.

Use the portal to enhance the findability of high-value datasets

Portugal has defined but not yet implemented a dedicated page for HVDs that will have content and examples from the portal. It also intends to **tag its HVDs to increase their findability**. **Slovakia** also highlights the potential of using the "type" DCAT-AP property (*dct:type*) ⁽¹⁰⁾ for HVDs to further enhance their discoverability via SPARQL queries.

7. The quality dimension

The **quality dimension** of the ODM assessment encourages national portals to publish datasets with high-quality metadata. It investigates the maturity of metadata quality by assessing (1) metadata currency and completeness – that systematic approaches are in place to ensure that metadata is up to date; (2) monitoring and measures – that mechanisms are in place to monitor metadata quality on the national portal and support data providers to publish high-quality metadata; (3) DCAT-AP ⁽¹¹⁾ compliance – that usage of the DCAT-AP metadata standard is monitored and encouraged; and

⁽⁸⁾ <https://github.com/datova-kancelaria/nkod-pipeline> and <https://github.com/slovak-egov/nkod-portal>.

⁽⁹⁾ odh.data.gov.rs.

⁽¹⁰⁾ <https://publications.europa.eu/resource/authority/dataset-type/HVD>.

⁽¹¹⁾ <https://www.w3.org/TR/vocab-dcat/>.

(4) deployment quality and linked data – that a model is used to assess the quality of data and metadata deployment.

This section summarises several best practices related to monitoring metadata quality and ensuring that data providers supply high-quality datasets.

Update the portal to provide tools to improve metadata quality

Portugal highlights that its improvement in the portal dimension has also enabled it to improve in the quality dimension. By updating the framework of its portal, Portugal was able to **introduce a monitoring tool for various parameters associated with the individual quality of each dataset** and improve the readability of metadata for portal users.

Serbia has similarly mentioned introducing a **tool to assist data providers in assessing the quality of their datasets as they upload them** to the portal, as part of the ongoing efforts to enhance the functionality of the open data portal. Besides this tool for data providers, Serbia has developed dashboards that allow the internal team to track and monitor metadata quality metrics.

Regarding portal updates, **Slovakia** specifically emphasises the need to **choose a technology infrastructure that best supports the DCAT-AP framework**. As such, the country's improvements in this dimension are mainly due to the transition away from Comprehensive Knowledge Archive Network (CKAN) technology, the implementation of DCAT-AP and, consequently, the introduction of a SPARQL endpoint. In addition, Slovakia advises creating a national derivation of DCAT-AP. In Slovakia, this is DCAT-AP-SK2.0.1 ⁽¹²⁾.

Ensure that licensing terms are clear and understandable

Serbia reports having **simplified and 'translated' the legal jargon of the licensing requirements specified in the law on e-government into more user-friendly language**. The aim was to demystify the licensing process and make it more accessible to data publishers. The open data team reports that these efforts have led to a notable increase in the number of datasets with appropriate licences published on its open data portal. In its answers to the best practices questionnaire, the Serbian open data team reflects that, 'By empowering publishers with the tools and resources they need to navigate the licensing process effectively, we are fostering a culture of accountability and responsible data stewardship within our open data ecosystem.' Overall, it is important to remove barriers to compliance and streamline the process of attributing licences to datasets.

Communicate directly with data providers about metadata quality

One of **Portugal's** strategies to promote metadata quality is **to give direct advice to data providers in the context of ad hoc meetings**. It highlights using the data.europa.eu data quality guidelines ⁽¹³⁾ as a starting point for recommendations in terms of metadata quality. In the future, Portugal plans to develop manuals on good practices of open data provision for data providers to further motivate the providers to provide high-quality datasets. Another strategy Portugal is considering for the future is involving reusers in requesting higher quality from the datasets, such as updating the datasets and providing more information about them. **Serbia** plans to introduce the role of an open data portal editor who will be tasked with overseeing metadata quality standards and fostering regular communication with data providers.

⁽¹²⁾ <https://datova-kancelaria.github.io/dcat-ap-sk-2.0/>.

⁽¹³⁾ <https://op.europa.eu/s/zhj>.

On the other hand, **Slovakia** has implemented built-in metadata quality measurements based on the data.europa.eu metadata quality assessment ⁽¹⁴⁾, which are published as reports ⁽¹⁵⁾. The open data team notes that it is necessary for **data providers to improve their catalogue using the output from the metadata quality report**.

8. Conclusion

This report delved into the open data practices of **Portugal, Serbia and Slovakia**, the three countries that showed the highest growth in maturity between the 2022 and 2023 ODM assessments. The countries had similarities and differences in their approaches but demonstrate that there are multiple ways to achieve high maturity in the field of open data.

All three countries underscore the **importance of a clear open data policy and strategy**, coupled with tangible and achievable action plans. Each country prioritises **fostering a vibrant open data community**, encompassing both data providers and reusers. These efforts are supported by **keeping the technology of the national open data portals up to date and incorporating user feedback and analytics** to improve continuously.

The best practices summarised in this report are the following.

1. Raise awareness as a key precursor to successful policy implementation.
2. Have strong national policies that influence the implementation and reuse of open data.
3. Benchmark existing practices that measure the impact of open data.
4. Go beyond the open data portal to gather reuse cases.
5. Increase the quality and usability of open data.
6. Continuously update the national open data portal based on new technologies, user feedback and lessons from other countries.
7. Use the portal to enhance community engagement and offer interactive channels of communication.
8. Use the portal to enhance the findability of high-value datasets.
9. Update the portal to provide tools to improve metadata quality.
10. Ensure that licensing terms are clear and understandable.
11. Communicate directly with data providers about metadata quality.

Other countries looking to improve their ODM can consider these best practices as a source of inspiration and guidance when developing their own strategies and action plans.

⁽¹⁴⁾ <https://data.europa.eu/mqa>.

⁽¹⁵⁾ Reports of metadata quality from data.slovensko.sk are available at <https://data.slovensko.sk/kvalita-metadat>.



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