

Methodology for Open Data Publishing





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Author(s): Zoran Luša Božo Zeba

for The Regional School of Public Administration Danilovgrad, Montenegro

The Regional School for Public Administration (ReSPA) is an inter-governmental organisation for enhancing regional cooperation, promoting shared learning and supporting the development of public administration in the Western Balkans. As such, it helps governments in the region develop better public administration, public services and overall governance systems for their citizens and businesses and helps prepare them for membership and integration into the European Union (EU). The ReSPA members are Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia, while Kosovo^{*1} is a beneficiary.

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CONTACT

Regional School of Public Administration Branelovica, P.O. Box 31, 81410 Danilovgrad, Montenegro Telephone: +382 (0)20 817 200 Internet: <u>www.respaweb.eu</u> E-mail: respa-info@respaweb.eu

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ABBREVIATIONS

ReSPA	Regional School of Public Administration
CC	Creative Commons
CC0	Public Domain Dedication
CC-BY	Creative Commons Attribution
CC-BY-SA	Creative Commons Attribution Share Alike
CC-BY-ND	Creative Commons Attribution No Derivatives
CC-BY-NC	Creative Commons Attribution Non Commercial
CC-BY-NC-SA	Creative Commons Attribution Non Commercial Share Alike
CC-BY-NC-ND	Creative Commons Attribution Non Commercial No Derivatives
ODC-BY	Open Data Commons Attribution License
ODDbL	Open Data Commons Open Database License
PDDL	Open Data Commons Public Domain Dedication and License
WB	Western Balkan
ΑΡΙ	Application Programming Interface
DCAT-AP	Data Catalogue Vocabulary for the European data Portal ²
High-value Data- set Act	Commission Implementing Regulation (EU) 2023/138 of 21 Decem- ber 2022 laying down a list of specific high-value datasets and the arrangements for their publication and re-use
INSPIRE	INfrastructure for SPatial Information (INSPIRE) is Directive 2007/2/ EC of the European Parliament and the EU Council from March 14, 2007, regarding spatial data and supporting the creation of policy relating to the environment.
NWP	Numeric Weather Prediction
OGP	Open Government Partnership
Open Data Direc- tive	Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information

EXECUTIVE SUMMARY

The provided document has three distinct sections, each contributing valuable insights to the ReSPA Members administrations' open data initiatives and their evaluation. In the opening section, the presented methodology evaluates the worth of open datasets as an instrument for Western Balkan public administrations. It enables the collection of stakeholder feedback on datasets, either before (ex-ante) or after (ex-post) their publication. In the ex-ante phase, this approach guides administrations or data providers in determining which datasets to unveil based on their significance. During the ex-post phase, administrations can monitor data re-use and offer enhanced support to re-users. This framework integrates universally acknowledged techniques, fine-tuned for the Western Balkans' requirements. It equips the Western Balkans in gauging dataset value, weighing stakeholder input from both before and after publication. Methods like Economic Impact Analysis, Usage Statistics, Cost-Benefit Analysis, and Data Quality Assessment are employed, offering a holistic perspective, ensuring the methodology's efficacy. It's essential to recognize that the true value of data lies in its re-use. When data remains exclusively accessible to its owner, its potential value is constrained to the owner's singular perspective. However, there are several methods and approaches commonly used to quantify its value. This document in its second section also explores open data practices, focusing on ReSPA Members administrations' journey towards data transparency, collaboration, and innovation. The significance of licensing open data is highlighted as a crucial foundation for fostering data accessibility and enabling informed decision-making. Recognizing the diversity of WB administrations' progress, the importance of coherent licensing frameworks resonates across borders.

The document underscores the role of Creative Commons licenses, such as CC-BY and CC0, in shaping open data initiatives. Emphasizing Montenegro's endorsement of the CC-BY license and Serbia's use of the Open License 2.0, the document highlights these standards as enablers of seamless data sharing and collaboration.

The option of developing national licenses tailored to international standards, notably CC-BY or CC0, is also explored. European practices provide guidance, showcasing the compatibility and interoperability of such licenses.

Through a thorough review of open data portals in the WB region, the document in its third section shows common trends and opportunities for enhancement. While advanced search functionalities and general feedback mechanism mark progress in the development of open data portals, addressing areas like notification systems, transparency, high-value dataset promotion can amplify user experiences. Administrations can also benefit from seeking help with the Open Data Maturity questionnaire. The WB administrations' journey towards open data maturity is one of dedication and collective effort. With common challenges across ReSPA Members, the roadmap to enhancing transparency, accountability, and socio-economic growth is mapped. Collaboration and knowledge exchange with European counterparts enrich this journey, unlocking the potential of open data for lasting societal and economic benefits.

SECTION 1 - PROPOSAL FOR A COMMON AND SOUND METHODOLOGY FOR VALUE ASSESMENT OF OPEN DATA

1.1 Introduction

Measuring the value of open datasets is challenging because they are very diverse, and the value derived from them can be influenced by many different factors and depends on the sector and context. It becomes even more complex when we observe the change in value over time.

However, there are several methods and approaches commonly used to quantify its value. These include: Economic Impact Analysis: Studies that attempt to measure the economic impact of open data sets. This could be done by analysing the revenue generated by companies using these datasets or the cost savings achieved by governments or other entities due to open data. However, this may not cover the full range of possible values of open data, such as societal or environmental benefits.

Usage Statistics: Measuring the number of downloads, views, or other forms of interaction with a dataset can be a rough measure of its value. This could be combined with surveys or user interviews to gain a deeper understanding of how the data is being used and its value.

Cost-benefit analysis: This analysis compares the costs of opening the dataset (e.g., the costs of data cleaning, anonymization, hosting, and maintenance) with the resulting benefits.

Citations and References: In academic or research contexts, the number of times a dataset is cited in papers, articles, reports, or other works can serve as a proxy for its value.

Case Studies: Detailed case studies of how a dataset has been used can provide valuable qualitative information about its value. These can show, for example, how the data has been used to solve a particular problem, drive innovation, or generate value in other ways.

Market Prices: For some datasets, there might be similar data that is sold on the market. These prices could serve as a reference for the potential value of the open data.

Data Quality Assessment: The quality of data can also be a determinant of its value. Aspects of data quality include completeness, accuracy, timeliness, consistency, and relevancy. High-quality data tend to have more value because they are more useful to users.

It is difficult to measure the exact value of open datasets because their value can be very context-dependent and have non-economic benefits that are hard to quantify, such as promoting transparency and enabling citizen engagement. Additionally, the "value" of open data can increase over time as it is used in new and innovative ways. Therefore, these methods can be seen as ways of estimating or indicating value, rather than providing a definitive measurement.

To assess and measure the results of the improvement of the Western Balkans' open data ecosystem in a

transparent manner, it is necessary to choose the approach, methodology, and criteria for evaluating the value and impact of open data sets on different development areas. At the key points in the project "The State of Open Data"3 It is stated that "...measurement is critical to the future of open data because it provides a mechanism to track progress over time. Measurement has also played a role in securing improved engagement in open data work from some governments." Another important point to be explained for the methodology for measuring the value of open data sets is the

high-value dataset.

High-value datasets generally refer to datasets that are particularly valuable and have significant potential to generate substantial benefits or impact. These datasets are often characterized by their potential to drive innovation, inform evidence-based decision-making, and contribute to economic, governmental, social, or environmental development.

In general, high-value datasets can be associated with the following characteristics: Richness and Granularity: High-value datasets often contain detailed and granular information, providing a comprehensive view of the subject matter they cover. They are rich in data points and can offer insights into specific aspects of a topic.

Timeliness: Datasets that are regularly updated and provide real-time or near-real-time data are considered highly valuable, especially in dynamic environments where up-to-date information is crucial. Interoperability: Datasets that are structured and formatted in a way that facilitates interoperability and integration with other datasets are often considered high value. This allows for more comprehensive analyses and cross-domain insights.

Relevance and Public Interest: Datasets that address critical issues and topics of public interest, such as healthcare, climate change, transportation, or finance, are often regarded as high value due to their potential impact on society.

Utility for Decision-making: Datasets that are relevant for informing policymaking, business strategies, or research endeavours are highly valuable as they can directly influence decision-makers and drive positive outcomes.

Scalability: High-value datasets are often scalable, meaning they can be used at different levels, from local to national or even global, to address diverse challenges. Privacy and Security Considerations: While being high value, these datasets may also contain sensitive information. Ensuring appropriate privacy and security measures is essential for responsible data sharing and usage.

It is important in the context of high value datasets to refer to recent EU open data regulatory framework, which imposes obligations around the high value open data sets. These efforts are derived from latest Open Data directive4 (previous directive was Public Sector Information directive5 or PSI directive) which provided ground for the administrative establishment of a list of high-value data broken down into 6 categories. For defining high-value datasets to be published in each of the categories, the European Commission carried out a survey using a several methodological tools like interviews, desk research, online surveys, legal data collection, public consultations, etc.

Finally, the European Commission adopted a subsidiary regulatory act as of 21 December 2022 "Commission Implementing Regulation (EU) 2023/138 laying down a list of specific high-value datasets and the arrangements for their publication and re-use"6 by which it established a list of high-value data to be published in all EU Member States. This Regulation obliges EU Member States to publish defined high-value datasets by no later than the date 10th of April 2024.

https://stateofopendata.od4d.net/chapters/issues/measurement.html https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019L1024

https://eur-lex.europa.eu/legal-content/EN/TXTl?uri=CELEX:32003L0098 https://eur-lex.europa.eu/legal-content/EN/TXTl?uri=uriserv%3AOJ.L_2023.019.01.0043.01.ENG

Although there has been an expansion of the new open data portals in the last decade and the development of supporting tools and applications, as well as an increase in the use of this data by different stakeholders, comprehensive research and understanding of the value and impact of open data sets on different segments of society have diverse approach.

Measurement tools that have been analysed are shown in the following table:

Name	Methodology in brief	Geographic coverage
ODB opendatabarom- eter.org	Expert survey and secondary data. Assess- ment based on quantitative and qualitative data that combines contextual data, technical assessments, and secondary third-party indi- cators. Results are peer-reviewed and have a QA process.	Focuses on national governments. ODB covers the period from 2008-2019 and closes its research activities in 2019. In 2013, 77 countries were analysed, and in 2017, 30 countries worldwide were analysed.
Global Data Ba- rometer https://globalda- tabarometer.org/	The methodology was developed in 2021 and it represents an improvement of the previous Open data barometer methodology. Signifi- cant changes are made, and it is not compa- rable directly with its predecessor.	109 countries worldwide were analysed in the period May 2019 - May 2021. The methodology assesses the presence, quality, and relevance of data and gov- ernance frameworks using a scoring system
GODI index.okfn.org	The Global Open Data Index (GODI) eval- uates the open data publication of govern- ments globally, focusing on national data and data findability. It operates under the assump- tion that governments are responsible for key data categories' publication, and it measures data publication at a national level. The meth- odology also accounts for political structures by assessing 'places' rather than 'countries' in cases of significant administrative autonomy.	94 countries worldwide were covered in 2016–2017 (focuses on national gov- ernments). Expanding coverage from 70 countries in 2013 to 94 countries in 2016–2017. The project has been ar- chived and it is no longer active.
Open Data In- ventory https://odin. opendatawatch. com/	The research is conducted by trained re- searchers who duly incorporate insights from public administration officials. The staff of Open Data Watch oversees a systematic re- view process consisting of two distinct stages.	The global assessment covered 125 na- tions in 2015, with the number of coun- tries evaluated progressively increasing over time. In the most recent report for 2022/23, the Open Data Inventory meth- odology was applied to evaluate a total of 192 countries.
OECD OURdata Index https://stateo- fopendata.od4d. net/chapters/ issues/measure- ment.html	Government survey completed by public sector officials from OECD countries and partners with analysis by OECD Secretariat. Includes secondary third-party indicators. A high-level overview of the report can be found in the OECD publications. Note that OUR data methodologies are not publicly available online.	34 countries covered in the 2019 OUR- data Index. 32 were OECD countries (focuses on national governments) and 2 were country partners (Colombia and Argentina).
European Open Data Maturity re- port https://data.eu- ropa.eu/en/publi- cations/open-da- ta-maturity	The European Commission-funded survey was conducted with the assistance of state officials and with validation and analysis from the European Data Portal team. The survey is conducted from 2015 yearly, and the method- ology significantly changed twice.	35 countries covered in 2022, including the 27 EU member states, Norway, Swit- zerland, and Iceland, and EU accession countries Ukraine, Albania, Bosnia and Herzegovina, Serbia, and Montenegro.

Evaluations of the re-use of open datasets and potential impacts often are limited either by the number of case studies or by the methodology applied or topics and sectors covered. Countries that have a methodology collect insights into the re-use of open datasets through surveys and web analysis, but it is much more complex to measure the impact resulting from the re-use of data. Open data sets can certainly have a strong impact on the everyday life of citizens, but it is extremely difficult to quantify this impact and the related value of datasets, as demonstrated by the analyses of available approaches and methodologies related to the evaluation of the impact and value of open data sets.

Table 1 Measurement tools

1.2 Evaluating Open Data: Approaches and Methodologies

Analysis of approaches used and methodologies for evaluating the value and impact of open data sets was conducted as a secondary study by summarizing, comparing, and synthesizing existing literature and methodologies. Besides reports listed in Table 1, the analysis covers reports from international institutions (UN, World Bank) on open data, other reports, and applied methodology of the European data Portal, the book Open data in developing economies: "Toward building an evidence base on what works and how" by Stefaan G. Verhulst and Andrew Young, as well as case studies from countries around the world.

The analysis led to the conclusion that open datasets and their value are closely linked to the ability of the user to re-use the data and their impact on different aspects of society.

The open data sets have less or no value at the moment when they are published but value grows at the time when they are used (Janssen, Charalabidis and Zuiderwijk, 2012). Furthermore, value is not a fixed number, value changes over time. A recent example is COVID-19 infection and vaccination data which was the most wanted data at the begging of the crisis, and the latter is valuable mostly for experts in the health sector. When open data sets attain value and become useful, their impact can be demonstrated. A complete understanding of value and impact is an extremely complex task due to all the variables involved. Analyses have shown that there are examples when the re-use of open data sets resulted in a priori certain expected impacts, so there are organizations and institutions that have tried to measure impact based on the compilation of case studies and qualitative analysis of their implementation. In general, the existence of such impact indicators is limited due to the specificity of each case and the local usage environment.

Various studies looked at the impact of open data sets from several perspectives. Ubaldi (2013) defined impact as added value and benefits for stakeholders of the re-use of open data in the selected problem area including government, citizens, civil society, the wider economy, and private and public sectors. Carrara, Vollers, and Berends (2017a) showed influence by conducting a survey and interviews with over 76 private organizations that use open data from the chosen problem area to develop their business models. However, Huijboom and Van den Broek (2011) argue that deeper insights are needed to understand the multiple impacts of open data including their effectiveness and reuse to establish successful policies. Meng (2014) studied the social impacts of open data and analysed how marginalized social groups can access open data. Gurstein (2011), in turn, criticized the claim that "open data is for everyone" and noted that guaranteeing open access to data does not mean efficient use, as accessibility often focuses on certain educated social groups that have access to technology. Zuiderwijk and Janssen (2014) proposed a framework for comparing open data policies and found that international cooperation between authorities and organizations is key to the real and continuous progress of open data policies. They also stressed the importance of identifying the role of users of open data sets to adequately understand their needs and to successfully link their user needs with the service provider. Williamson and Eisen (2016) also stressed the importance of identifying end-users as one of the first steps in implementing successful open data initiatives. The European Data Portal connects all Open Data portals of EU Member States (EU27), Open Data portals of Norway, Iceland, Switzerland, and United Kingdom, and Open Data portals of EU accession countries - Ukraine, Serbia, Montenegro, and Moldova and analyses how companies generate benefits from the re-use of open data (Carrara et al., 2017a).

However, very little is known about the underlying organizational mechanisms and implications of the use of open data at the organizational or state level. The economic effects of open data were assessed ex-ante by different reports, but the literature still lacks an ex-post analysis focusing on the overall materialized effects. The current knowledge of the impact of open data is based on case studies and limited to narrow areas, and there is still no comprehensive assessment report on the impact of opening a dataset at the country level.

Past case studies have found that open data sets improve the way public resources are used. In France, for example, open data sets helped the government to use energy resources in public buildings more efficiently7,

https://www.etalab.gouv.fr/analyser-les-consommations-energetigues-des-batiments-publics

while government departments in Australia improved cooperation through the8 multi-Agency Data Integration project. Furthermore, it has been demonstrated that open datasets foster transparency, accountability, and inclusion. For example, open data helped journalists in Uruguay discover irregularities in the financing of political parties9. The involvement of citizens10 in South Korea has allowed the public to control government spending, while citizens in Japan can now monitor government investment in the IT sector11. Case studies have also shown that open data generates social impact through greater involvement of citizens in addressing the problem area. For example, open data in Mexico encouraged financial inclusion12, in China to fight pollution13, in Canada to address the consequences of climate change14, in the Philippines to manage natural disaster risks15, and in New Zealand to improve the management of natural resources16. Finally, case studies show that open data have positive economic impacts: in the United States, open data drives economic growth17, while in the United Kingdom, it creates business opportunities18 and makes whole sectors more efficient19. Hundreds of emerging data-processing companies around the world20 are creating new market opportunities and data-driven business models.

The recent wider spread and use of AI tools, even more emphasize importance of access to accurate and reliable data as critical component for perfecting AI performance. As Ziesche21 (2023) stated "Further critical aspects of data are that they are findable, accessible, interoperable, and reusable (FAIR) by anyone for any purpose". Lack of advancement in publication of the data owned by public administrations of the Western Balkan administrations can lead to slower progress in the adoption of digital technology such as artificial intelligence. On the other hand, if the Western Balkan administrations build open data ecosystems on principles such as the FAIR approach, this can contribute to a significant reduction of the gap towards EU countries. These examples conclude that there are clear benefits for administrations committing to open data. The impact we are seeing right now is just the beginning of what is possible if the data is opened and there are people with the skills and tools to use it.

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https://www.pmc.gov.au/sites/default/files/publications/Implementation-Public-Sector-Data-Management-Report_0.pdf

https://www.sudestada.com.uy/articleId 502c01a3-9f53-4f13-8f1e-154142ac3fc4/10981/Detalle-de-Investigar 10 http://www.hani.co.kr/arti/politics/assembly/816995.html 11 https://www.itdashboard.go.jp/er

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¹⁵ https://noah.up.edu.ph/

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https://www.fedscoop.com/open-data-economic-growth-priority-trump-administration/

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Soenke, Ziesche (2023): Open data for Al; What now? UNESCO publication ISBN: 978-92-3-100600-5

1.3 Methodology

In the process of opening the data it is possible to approach it in two directions: from bottom to up or from top to bottom. Both approaches are briefly explained, as they are commonly known approaches.

Opening top-down data starts with the choice of sets to open, in order to stimulate scenarios of their reuse and thus create added value. As the scenarios of use and the intended effects of data opening are not known in advance, the criterion for selecting datasets is based on the practice or assessment of high-value datasets by other countries, in particular Member States of the European Union.





The bottom-up approach prioritizes understanding of the purpose of opening the data, i.e., the desired impacts and added value, before identifying the reuse scenario and the open data sets themselves. After defining the purpose, a targeted opening of relevant datasets and activation of stakeholders for data re-use shall be undertaken with a view to fulfilling the purpose and achieving the desired effects.



To evaluate the impact of the open data set before and/or after the open data set is published, it is necessary to systematically approach the opening of the data set with the aim of solving a particular problem area to create a link between the open data set and a positive change within the problem area. Given the time at which they take place, two approaches to evaluating the impact of the set of open data can be used, ex-ante and ex-post (Figure 3).



Figure 3 ex-ante and ex-post approach to evaluating the impact of the open dataset.

The ex-ante approach implies a qualitative assessment of the potential i.e., expected impact of the open data set through the setting of theoretical assumptions and case analysis before the publication of the data set itself. The ex-post approach requires a quantitative, i.e., empirical, analysis of the realized impact of the open data set after the publication of the data set (usually after a minimum of two years). Several reports aimed to evaluate the impact of open data sets ex-ante (see Vickers, 2011), while ex-post analysis remains in its initial stages, due to measurement difficulties and the lack of systematically collected statistics on the use of open data sets, and the fact that ex-post impact evaluation remains a relatively new phenomenon. To enable the development and implementation of the impact measure of the open data set both before (ex-ante) and after (ex-post) publication of the data set, in the case of the Western Balkan administrations we propose to base the methodology on the bottom-up approach. The specificity of the methodology described below is that it can be used to identify high-value datasets. The advantage of the bottom-up approach is that it enables a more efficient and useful opening of the dataset, but also easier measuring of impact because this approach identifies the problem area, all participants in the process, and the expected effects of opening the dataset. This fact enables the development of a quantitative measure of the influence of an open data set, i.e., the development of an index of the influence of an open data set. With the broader perspective, and with the influence of time, the open data value ecosystem is even more complex. Value is influenced by stakeholder perspectives, whether you are a re-user of the publisher. They can have opposite opinions about values. This complex interaction is represented in following figure:

Figure 2 Schematic representation of the hierarchy: dataset - > reuse scenarios - > impact and added value and activity direction in the bottom-up approach.



Figure 4 Open data eco-system

A methodology proposed allows the ranking of different datasets according to:

- 1. The total value of the open data set impact index (A)
- 2. Economic Impact Index of (B)
- 3. Social Impact Index (C)
- 4. Governmental Impact Index (D)
- 5. Environmental Impact Index (E)
- 6. Usage Index (F)

where is:

A = B + C + D + E + F

The total impact index of the open data set is the weighted sum of four sub-indexes that measure four categories of impacts of the open data set - economic, social, governmental, and environmental, in a case of ex-ante measurement, and in the case of ex-post measurement Usage Index is added.

For the organization of survey based on the proposed methodology, a research team should be formed. For the proper result, when the survey is conducted, all stakeholder categories of open data eco-fallow shall be represented proportionately. Open data eco-system stakeholders are divided into the four groups:

- 1. datasets publishers,
- 2. re-users of data and software solutions,
- 3. authors of software solutions; and
- 4. other stakeholders.

It is possible to categorize stakeholders differently, but according to the author's experience, this division is adequate for the WB region.

All indexes are based on the scores in the survey and are completed by:

- Research team members – the research team members should self-assess as they represent an extremely valuable source of information and for their further involvement in the process of evaluating the impact of the open data set. The results of the self-assessment shall then be shared with the team of responsible persons to validate the assigned scores for each survey question.

- Other stakeholders of the process – All participants in the process of opening the data set need to respond to the questionnaire, especially those with a mission to solve key issues of the problem area. It is extremely important to provide explanations for the evaluations and evidence if possible. The team of responsible persons should then review the assigned ratings, explanations, and evidence (if any) and correct the ratings if they are not awarded following the guide for the development of the impact index.

It is important to point out that the allocation of maximum scores should be very rare, as the maximum result implies that there is no room to improve the impact of the open data set, which is not true in most cases. Similar attention should also be given when a zero rating is awarded. In both cases, there should be strong evidence of such extreme grades. Furthermore, it is important that for each assessment awarded there is a concise and clear explanation, evidence of, and confidence level (0%, 25%, 50%, 75%, 95%, or 100%). Personal opinions and broad generalizations without specific evidence are not accepted so that the result of the index would not be biased. In the case of an assessment of the potential impact of an ex-ante questionnaire, it is not possible to have materialized evidence, it is therefore necessary to provide evidence from similar case studies in other countries and/or to offer at least one strong objective argument in support of the assessment awarded for each assessment of the potential impact.

The team of responsible persons shall be composed of representatives of a central body whose role shall be to: - Examine in detail whether the scores awarded in the guestionnaire comply with the award criteria;

- awarded:

- Assign an up-to-date assessment of the dataset in the design of the ex-post impact index of the dataset according to the criterion set out in Appendix B: Guide to the production of impact indices.

- Independently manage the process of constructing an ex-ante or ex-post impact index of a dataset.

An extremely important methodological step is the identification of expected, like desired impacts of the set of open data during the first step of the bottom-up approach. It is then necessary to classify the desired impacts into four possible categories of impacts: economic, social, governmental, and environmental. It is important to point out that different datasets will have different predispositions for these open data set impact categories. Therefore, for example, one dataset will have an extremely pronounced economic impact and a low or no pronounced environmental impact, while the other dataset will have a strong environmental impact and no pronounced governmental impact, etc. For this reason, the methodology enables special observation of the components of the total impact index and allows changes in determining the weighting of the components so that the total value of the index credibly reflects the overall impact of a given dataset on addressing key issues in the problem area. Therefore, it is important to point out that the impact of the open data set is high, and that the set can be considered high value if there is clear evidence that the data set has achieved the desired impacts and/or has strong potential for the same within the identified problem area. This is why the methodology predicts changes in the allocation of weights in the design of the index of the total impact of the open data set. The size of the weighting of the impact categories shall be determined by the consensus of the members of the core team. Numerous case studies and analyses have identified the most important components of the economic, social, governmental, and environmental impact of the open data set. Consequently, the methodology envisages the implementation of these components in the process of identifying the desired impacts of the open data set and in the contents of the survey questionnaire (Appendix A: Survey questionnaire).

- Examine in detail the veracity of the arguments/evidence/examples justifying the assessments granted; - Correct the scores awarded if there is no or incorrect argument/evidence/example justifying the score

1.4 Survey process model (bottom-up)

The bottom-up approach prioritizes understanding of the purpose of opening the data, i.e., the desired impacts and added value, before identifying the reuse scenario and the open data sets themselves. After defining the purpose, a targeted opening of relevant datasets and activation of stakeholders for data re-use shall be undertaken with a view to fulfilling the purpose and achieving the desired effects. Figure 5 shows the steps of this process:



Figure 5 Schematic representation of the process of opening bottom-up access data

The methodology of GovLab "toward an open data demand assessment and methodology"²² was taken as the basis for the development of this approach.

Step 1: priority of the problem area (prioritization of the purpose of data opening)

As with most public goods, the demand for open datasets can be infinite while supply is limited. In order to ensure maximum return on investment, it is important to identify the problem areas and societal problems that are considered priorities or where the use of open data sets could have the greatest positive effects. In this step of the process, it is necessary to:

- 1. Identify specific problems or areas of concern that are considered a priority in society. In doing so, it is desirable to consult past practice and research on the use of open data in the identified area in other countries, such as the open data's impact²³ portal.
- 2. Identify the core team, composed of a multidisciplinary team of experts from the problem area, including the public and private sectors, academia, and NGOs.
- 3. Deepen and contextualize key issues for a given area. Questions should be segmented into four recognized areas of open data impact: economic impact, social impact, governmental influence, and environmental impact.
- 4. Identify the desired effects since the opening of data in this problem area.
- 5. Identify potential scenarios of re-use of open data to achieve the desired effects.

Example Template	
Problem area	Emigration of working age population
Core team	Representatives of relevant stakeholders.
Question formation	Economic impact: in what environments and regions is the highest rate of emigration? To what extent does the number of newly created jobs affect emigration? What industries, such as organic farming or rural tourism, have the greatest potential to create new jobs in these areas?
Desired effects in the problem area	Economic impact: reducing the trend of emigration is enabled by opening new economic opportunities and better presentation of quality of life in the Republic of Croatia and comparison of all real costs of living in the Republic of Croatia and EU member States. Social impact: contributing to a positive social climate or belief in a prosper- ous future in the country
Potential for re-use of open data in the prob- lem area	Continuous analysis of data on production and import and export of indi- vidual agricultural crops, point to entrepreneurial potential from additional cultivation of these crops. Create an index of quality of life in the Republic of Croatia, by city or region, which will enable each individual to set the order of important life priorities, and then make a comparison within these priorities of indicators available through open data (e.g., air and water cleanliness, school quality, living costs, education costs, health costs, average travel time to work, etc.)

Table 2 Example template for problem area research

The priority of the problem area, from an organizational perspective, can be addressed in two ways:

- for the composition of the Group depends on the sectoral problem that need to be tackled.
- process.

Step 2: identifying and engaging stakeholders to reuse open data in the selected problem area

In this step of the process, the core team's task is to identify stakeholders who have a direct mission to address priority issues and issues, as well as other stakeholders who may have an interest in engaging in problem solving. In accordance with the analyses of stakeholders' needs and expectations, the prospective other stakeholders and their motives are: The academic community shall:

- and data science methods to existing data sets, in a particular problem area.

Private sector:

- computer or data science;
- dress specific social problems and promote socio-responsible business;

23 18 By selecting a group of experts who will periodically define problem areas on their own. The proposal

Crowdsourced Innovation – an approach in which the possibility of proposing problem areas for innovative re-use of open data is left to registered users of the national portals, with mutual evaluation of the proposal by other users. The most evaluated proposals are considered for the next steps of the

- Active participation in the development of solutions for the problem area enables the student population to make practical use of acquired knowledge in the field of computer science or data science; Research of new approaches to problem solving - innovative application of technological solutions

Sponsoring Hackathon to get in direct contact with new personnel - engineering talents in the field of

Opening up part of their own data or assigning their own computing or professional capacities to ad-

Exploring new business opportunities for infomediary companies, i.e., companies that create added economic value by combining open and other datasets and making additional analyses over them for certain segments of users who do not have the resources to do so independently.

Owner: core team for the problem area.

Step 3: Opening up data and developing solutions

The core team, together with the stakeholders referred to in Step 2, shall develop an action plan to develop solutions. That action plan may include:

- Identification of key indicators to measure impacts in the problem area. -
- Identification of any potentially useful datasets for previously identified reuse scenarios and in particular high-value datasets. For the latter, it is proposed to use the methodology described in Chapter Methodology.
- Identification and engagement of meeting owners at the opening
- Choice of methods of reaching a solution, such as organization of Hackathon, building a public-private partnership to reach a specific solution, etc.
- How the solution is promoted, including the publication of applications and studies of cases of re-use of data on the portal.

Owner: engaged stakeholders.

Step 4: impact assessment of developed solutions and publication of usage cases

Ideally, the impact of the solutions developed should be measured by the percentage of fulfilment of the key indicators of desired impacts identified in the previous step. In order to achieve the objectivity of the impact assessment, the task is carried out by a team of responsible persons.

In addition, for solutions that achieve the desired effects to a significant extent, it is proposed to develop and publish a case of re-use of open data, in order to share innovative ideas with the rest of the interested community. A team of involved stakeholders shall participate in this activity, assisted by a team of responsible persons.

Recommendations for Implementing a 'Bottom-Up' Approach to Open Data in Western Balkans public administration:

- 1. Importance of Political Will: A firm political decision is essential for the implementation of the 'bottom-up' approach. Such a decision would ensure strategic guidance of the process with clearly defined responsibilities within specific institutions. Without decisive political backing, it's challenging to effect significant shifts in data management approaches.
- 2. Education and Empowerment of the Public Administration: Before data can be made open to the public, it's crucial to ensure that staff within the public administration understand the technical and strategic aspects of opening data. This means investing in training sessions and workshops to help build capacity and understanding of the importance of open data.
- 3. Analysis of the Current Situation: Demonstrating the need for a 'bottom-up' approach can be achieved by analysing the current availability of high-value data sets on portals. Such an analysis would provide concrete evidence of the deficiencies in the current 'supply' approach.
- 4. Decide on Problem Area Identification: Choose between a centralized approach (using an expert group on open data reuse) or a distributed method (using crowdsourced innovation) to identify problem areas.
- 5. Regular Problem Area Implementation: Commit to implementing the prescribed process for a minimum of two problem areas every year.
- 6. Engage Through Gamification: Embrace gamification methods, taking inspiration from Spain's Aporta challenge. This strategy can attract public and media attention, fostering increased stakeholder interest in participating in the process.

1.5 Expeced Dataset Impact Index

The expected impact index of a data set refers to an ex-ante impact index of a data set consisting of an index of expected economic, social, governmental, and environmental impact. The structure of the index itself is described in more detail in Chapter "Methodology".

Expected economic impact

Evaluation of the economic impact of the open data set is particularly important as the quantified benefits may conflict with the necessary costs for the production, collection, and publication of the open data set, thus arguing additional resources and efforts needed to advance the open data set. Several direct and indirect benefits from the use of the open data set can be identified. Direct economic impact refers to monetized benefits realized in market transactions in the form of income and gross value added (added), the number of jobs involved in the production of products or services, and cost savings. Indirect economic impact refers to new goods and services, time savings for users of open data sets and applications that use them, knowledge-based economic growth, growth of related markets, etc. The most direct economic impact of the open data set refers to the cost saved from obtaining the open data set free of charge. If the dataset is not publicly available, re-users should either buy it or produce it themselves. Indirect economic benefits can be identified through e.g., newly created jobs, saved resources, productivity gains, etc. Quantifying and demonstrating the economic impact of the open data set is a key element for each country to continue supporting open data sets initiatives, and to encourage the publication and re-use of the open data set.

The main areas where the largest economic impact of the open data set has been identified are:

- Improving existing products and services;
- The development of new products and services based on geospatial data, and
- Reducing the time and cost of data mergers.

The expected economic impact can be evaluated at the level of businesses, citizens and households, the public sector, and the economy as a whole. The most prominent possible economic impact for companies and entire industries is growth and increased productivity through efficiency improvement and the development of new products and services enabled through the opening of a dataset. Opening a dataset may also have the effect of creating new companies such as those in the infomediary (Infomediary) sector. Consequently, expected economic impacts may also include positive impacts on competitiveness, innovation, productivity, competitiveness, and market dynamics. Open data sets are increasingly seen as new business assets, which, unlike many other assets, are free of charge, thus opening the door to cheap innovation in the private sector. Many predictive analyses have shown the potential of open data sets to generate systemic and far-reaching economic growth, especially when combined with proprietary data of private sector entities²⁴. The most significant economic benefits of open data sets for citizens derive from free access to data and time savings. Also, positive economic impacts can be manifested through the impact on consumption, income distribution, and status of different population groups (e.g., employees, and recipients of different benefits). For public sector organizations, the opening of datasets offers cost savings through the impact on productivity in the public sector, and the possibility of improving the efficiency of service offers. For the economy as a whole, the economic benefits desired can result from cross-sectoral use of the open data set, impact on productivity and growth of the entire economy, and impact on labour markets. Since the world economy is becoming increasingly dependent on data and information, the availability of open data can certainly enable the creation of new business opportunities, stimulation of foreign direct investment, and significant creation of new jobs.

Expected Social Impact

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The social impact of the open data set refers to the ability of the data set to address certain societal challenges. Within a wide range of social aspects and challenges, particular attention should be paid to the impact of a set of open data on housing in urban areas and the involvement of marginalized social groups. Different aspects of housing – from availability through quality to price – are becoming increasingly important. Information on the housing district, its content, and its characteristics, helps citizens and businesses make

better-informed decisions on housing and business in a given area.

The involvement of marginalized social groups refers to a process in which individuals or entire communities whose involvement in politics and society was limited can use rights, opportunities, and resources to better participate in social, cultural, and political life.

Marginalized social groups can include older people, people with disabilities, minorities, and rural people. The social impact of the open data set can also be manifested in the application that enables better access to information about cultural life, and better user experience in museums, galleries, cities, historical sites, or tourist attractions.

Open data sets play a powerful role in empowering citizens. This role is visible in two ways:

- With more information available (e.g., Data on the health system or education choices), citizens can improve their decision-making and electoral capacity.
- As a result of increased transparency, open data sets can serve as a tool for social
- mobilization when information available to the public can inform about corruption or perceived corruption, consumer protection, healthcare, etc.

The social impact of open data sets is evident in the contribution they make to solving public problems. Open datasets can help solve complex public problems by:

- Especially in crises where geospatial information is extremely important, open data sets can improve situational awareness.
- The availability of open data sets can contribute to a wider involvement of experts in the process of solving public problems.

Expected governmental impact

The governmental impact relates to the impact of open data sets on the public sector and civic inclusion. Open data sets improve internal processes and public sector services and improve public sector connectivity with citizens. Furthermore, open datasets can serve governments as evidence to identify problems and formulate policies.

One of the most consistent ways in which open data sets exert governmental influence is by improving governance manifested in several ways:

- Greater transparency and civic inclusion make governments more accountable to citizens; -
- An institutional data-opening process highlighting the focus on data use and data-driven decision-making can result in better and more efficient provision of services;
- Data opening initiatives can increase information sharing, improving coordination and knowledge sharing.

Within the governmental impact category of open data sets, particular attention should be paid to the impact of the open data set on the improvement of:

- transparency and accountability,
- effectiveness (e.g., improving the quality of public services),
- the efficiency of the public sector (e.g., cost reduction),
- making decisions.

Expected environmental impact

There is currently a large amount of open data environmental datasets including geospatial data, meteorological data, air and water guality data, weather data, and noise level data. These datasets have the potential to enable users of new environmental knowledge and to increase civic inclusion and awareness of different environmental issues.

This methodology highlights in particular the impact of the open data set in addressing the following environmental issues:

- water and/or air quality, -
- waste management,
- environmentally friendly transport offers,

noise levels in cities.

For example, the city of Sofia in Bulgaria has developed a platform that informs users about air quality. This platform shows the level and daily average of the specific type of air pollution (PM10) from metering stations throughout the city. In addition, the platform provides a two-day PM10 forecast allowing citizens to learn about air quality and adapt their plans accordingly to avoid pollution. 24 (86%) Member States of the European Union have indicated that they provide services based on a set of open data for waste management and reduction. An example is the Italian website and the "Differenziata Teramo" application, which uses open data sets to inform and develop awareness among users about aspects such as proper urban waste separation and waste collection schedules. In terms of environmentally friendly transport offers, 23 (82%) EU Member States reported that there are applications, services, or platforms based on open data sets that aim to raise awareness of different sustainable transport options in their country. A good example is Elmo, from Estonia, a platform that informs electric car users about the locations of charging stations. 21 (75%) a Member State of the European Union has applications that use open data sets to raise awareness and protection against noise levels. For example, the Austrian app and website Lärminfo.at inform users about noise levels caused by cars, trains, airplanes, etc.

Open data set impact Index

As open data sets have become increasingly topical in the world, the focus of this section is the need to strengthen the ability to assess and measure the progress and impact of open data policies. It is crucial that the ex-ante evaluation of the impact of a set of open data can present the potential or expected benefits/ impacts of opening a set of data with clearly defined value proposals, while the ex-post evaluation should be able to use indicators and/or tools to assess the actual realization of the ex-ante defined expected i.e., desired impacts. Measuring the impact of the open data set, therefore, requires monitoring of impacts across the entire value chain of the open data set - from the initial collection and processing of the dataset to its publication and re-use. Consequently, the development of an open data set impact index is a key element of effective data management.

The dataset has no impact at the time of opening but becomes influential and useful when used. Once the set of open data becomes useful, its impact becomes visible. This is why it should be emphasized that the ex-ante impact index of the open data set represents an expert assessment of the expected impacts of the open data set in solving the problem area, while the ex-post impact index of the open data set represents a measure of realized impacts of the open data set in solving the problem area. Due to its complexity and all the variables involved, the design of the impact index of the open data set is built according to four categories:

- Economic impact,
- Social impact,
- Governmental influence,
- Environmental impact.

It is important to emphasize that the fifth category – the **usage index** – further enters the construction of the ex-post impact index of the open data set.

A schematic representation of the structure of the ex-ante index of the expected impact of the open data set is shown in Figure 6.



Figure 7 Schematic representation of the structure of the ex-ante index of the expected impact of the open data set

Figure 6 clearly shows that it is necessary, through the questionnaire, first to obtain indices of expected

economic, social, governmental, and environmental impact based on the awarded evaluations, to obtain an ex-ante index of the expected impact of the set of open data. Then the team of responsible persons determines the weighting size for each of the four obtained ex-ante indices in the construction of the overall ex-ante index of the expected impact of the open data set. It is extremely important that the size of the weighting is in line with the expected impacts of the open data set so that no category of the ex-ante index would be overestimated or underestimated or that the ex-ante index would not be biased (biased), and that an incorrect ex-ante evaluation of the value of the data set is ultimately prevented



Figure 8 Schematic representation of the structure of the ex-post impact index of the open data set

Figure 7 shows the *ex-post* structure of the impact index of the open data set, whereby all five index categories are constructed based on actual recorded impacts. Therefore, the two main differences between the ex-ante and ex-post indices are:

- 1. The ex-ante index measures the expected impact of the open data set and is based on professional theoretical assumptions and case studies from other countries, while the ex-post index measures the actual impact of the open data set and is based on quantitative indicators relevant to the observed impact categories.
- 2. The ex-post index also contains the fifth category the usage index which is designed based on the download rate, the referencing rate, the user's assessment of the usefulness of the dataset, and the up-to-date dataset (Chapter Open data set impact Index).

Identification of high-value datasets

To enable the identification of high-value datasets based on the ex-ante and ex-post impact index of the open data set, it is proposed to use the value scale described in Table 2.

$\frac{\text{Received value of the ex - ante or ex - post index}}{\text{Maximum value of the index}} \times 100\%$	Interpretation (Value of the set in solving the problem area)	
More than 70%	High-value dataset	
From 50 to 69%	Valuable dataset	
Between 30 and 49%	Low-value dataset	
Less than 30%	The dataset value is close to null	

Table 3 Value scale for identification of high-value datasets

This value scale requires the identification of the dataset as a high value if the ratio of the resulting value of the ex-ante or ex-post index exceeds 70% of the maximum achievable value of the open data set impact index.

This is theoretical scale, and it can be adjusted according to specific country or specific sector.

Economic impact Index

The (expected) economic impact index²⁵ shall be constructed based on assessments into questions divided into three categories:

- 1. The macroeconomic impact,
- 2. The microeconomic and sectoral impact, and
- 3. Impact on the public sector.

The macroeconomic impact category refers to monitoring the impact of the open data set on:

- Creating new jobs in the economy,
- Reduction of operating costs, and to increasing productivity in the economy.

The **microeconomic and sectoral impact** category shall cover the impact of the open data set on:

- growth and development of enterprises,
- improvement of existing goods and services,
- the development of new goods and services,
- reducing the time and cost of accessing information, and to
- growth and development of a sector.

The public sector impact category measures the impact of the open data set on the public sector impacts in the creation of new and innovative public services. It is important to emphasize that this methodology covers the overall economic impact on both traditional and new economic sectors such as the infomediary sector. Indeed, an open data set can have an economic impact on traditional economic sectors - for example, an open data set can allow companies to reduce costs or increase efficiency (e.g., use of weather or transport data for better business organization), improve economic planning, etc. However, the potential economic impact can also be manifested through entrepreneurship and new business models based on the processing of the observed set of open data as a key resource in their business operations.

Social impact Index

The (expected) social impact index²⁶ shall be constructed based on three categories:

- 1. housing,
- 2. the involvement of marginalized social groups, and
- 3. reducing social inequalities.

These three categories of social impact index were selected based on an exhaustive literature review or case studies.

The housing category shall include the impact of the open data set on:

raising awareness of housing in a given area.

The inclusion of marginalized social groups is a category of social impact that includes:

and/or cultural and/or economic and/or political life.

The reduction of inequalities as a category of social impact is accompanied by the contribution of the set of open data:

- □ to foster awareness of social equality, and
- □ fostering a balance between private and professional life.

contribution of the observed set of open data to the inclusion of marginalized social groups in social

²⁵ If it is constructed ex-ante, it is an index of expected economic impact

²⁶ If it is constructed ex-ante, it is an index of expected social impact

Governmental Impact Index

The (expected) governmental impact index²⁷ of the open data set shall be constructed based on the following categories:

- 1. transparency and accountability,
- 2. efficacy,
- 3. efficiency, and
- 4. deciding.

The transparency and accountability category shall make it possible to evaluate the impact of the open data set on increasing the transparency and accountability of the government and the public sector where the open data set provides insight into:

- public budgets and consequently public spending,
- the behaviour of political parties and politicians, and
- election results.

The category of the effectiveness of the governmental impact index of the open data set shall include the impact of the open data set on:

- increasing government/public effectiveness in the provision of public services;
- improving communication between citizens and the public sector, and
- □ increase the effectiveness of public administration.

An extremely important category of governmental influence of the open data set is efficiency if the open data set enables increasing public efficiency through the reduction of operating costs.

The last category of governmental impact of an open data set is decision-making and is of paramount importance if the open data set contributes to:

- evidence/data-based policymaking, and
- foster awareness of a particular topic and encourage accountability and action.

Environmental impact Index

The environmental impact index (expected)²⁸ shall be constructed based on the four selected most relevant categories of environmental impact:

- 1. Water and/or air quality,
- 2. Waste management/management,
- 3. Environmentally friendly transport, and
- 4. Noise level.

An environmental impact can be expected from the dataset if it encourages:

- information and awareness-raising on environmental categories, and on
- behavioural adjustment.

27 If it is constructed ex-ante, it is an index of expected governmental influence

28 If it is constructed ex-ante, it is an index of expected governmental influence

Usage Index

The usage index is used exclusively in the construction of the ex-post impact index of the open data set after at least one year has elapsed since the publication of the data set. The usage index shall consist of:

- 1. download rates,
- 2. the rate of referencing,
- 3. the user's assessment of the usefulness of the dataset; and
- 4. an up-to-date assessment of the dataset based on an up-to-date report;

(average) number of downloads of a dataset ne:

The download rate of a dataset is defined as the ratio of the (average)²⁹ number of downloads of a dataset download rate =

average number of downloads in the dataset theme

where the average number of downloads in the dataset theme is defined as the ratio of the total number of total number of downloads in the dataset theme average number of downloads in dataset theme number of datasets within the theme.

For example, if we constructed the download rate of an open data set called "cash" within the topic "finances", the download rate of the data set would be constructed as the ratio of the (average) number of downloads of the "cash" set to the average number of downloads in the topic "finances", whereby the average number of downloads in the topic "finances" would be the ratio of the total recorded number of downloads in the topic with the total number of datasets within the topic.

The data set reference rate is defined as the ratio between the (average)³⁰ number of applications and/or case studies and/or written works referencing a particular dataset, and the average number of references in (average) number of data set reference rate data set reference rate =

average number of references in the dataset theme

where the average number of references in the dataset theme is defined as the ratio between the total numtotal number of references n the dataset themene theme.

average number of references in the dataset theme number of datasets within the theme

The assessment of the usefulness of the dataset refers to the average assessment assigned to the dataset by users.

The evaluation of the up-to-date dataset shall be based on the updated report of the dataset, whereby the maximum evaluation shall be granted if the dataset is fully up to date. If the dataset is not fully up to date, zero shall be assigned.

Essential features of the methodological approach

It is of paramount importance to point out that not every set of open data has the potential to exert influence in each of the impact categories and sub-categories. If this fact were to be disregarded, there would be a problem of underestimating the expected and/or actual impact of the open data set leading to a "bias down" of the overall impact index of the open data set.

To avoid this problem, the team of responsible persons is authorized to modify the guestionnaire following the previously determined potential of the open data set by the core team and other stakeholders of the problem area involved in the process of opening the data set. Following the amendments made to the questionnaire, the team of responsible persons must also change the point scale, considering that the total maximum index value remains constant so that such modified index can be comparable with others. It is important to emphasize that all participants in the process - core team, other stakeholders of the process, and the team of responsible persons - should always be guided by the idea that the impact of the dataset is maximal if:

- provides a solution to key issues within the problem area,
- meets the demand side,
- achieve the desired effects, and if
- it serves as a resource for stakeholders in the problem area to address priority issues.

If more than one year has passed since the publication of the data set on the portal, then the average annual number of downloads of the observed data set is considered

If more than one year has elapsed since the publication of the dataset on the portal, then the average annual number of references of the observed dataset shall be taken

²⁹ in the construction of the download rate. If only one year has elapsed since the date of publication of the dataset on the portal, then the total number of downloads of the observed dataset shall be used.

³⁰ into the structure of the referencing rate. If only one year has elapsed since the date of publication of the dataset on the portal, then the total number of references of the observed dataset shall be used

2

SECTION 2 - COMMON LICENSING GUIDELINE

2.1 Introduction

In the programme envisaged for 2023-2025 ReSPA will focus on benefits of data driven administrations and more specifically to importance of using data and open data for knowledge-based economy and Open Government Partnership initiative. The focus will be on addressing common issues at policy and operation levels while providing the support for ensuring the commitment from the policy level.

For data to be classified as open, it should be accessible and licensed for anyone to access, use, and share, free of charge. An open data licence provides users with certainty that the data can be used and shared for a wide range of purposes.

This document includes information on benefits of licencing, how to choose the appropriate license among Common Creative license family, having in mind the needed quality and available and estimated cost of providing datasets and considering good practices in EU administrations. It also provides concrete alternative possibilities on licensing open data (Open Data Commons and option of creating national license) and includes examples of good practices in EU administrations.

2.2 License – why is it important?

License represents a permission that determines the ability to use, process, and distribute (open) datasets. In this way, we protect the data to ensure that datasets can be used clearly, unambiguously, and easily. **Without a license, the data will not be open**. The data may be available, but users will not have permission to use and combine them within the legal framework of data protection.

The use of data protected by intellectual property rights (copyright or database rights) belongs exclusively to the right holder. Therefore, licenses are crucial for reuse. The data provider, protected by copyright or database rights, grants the license holder - a person or entity to whom the license is granted - the right, permission to use that data. In other words, without granting a license, the use would not be allowed. Practically, licenses establish mutual obligations between the parties.

The data provider, for example, commits to giving the user the right to use the data with a certain level of detail and content. The license also describes the user's obligations, such as paying the due amount and using the data only for agreed purposes. For example, a licensed copy can be redistributed only if that right is explicitly granted to the license holder.

Certain administrations have created licenses for open data. For example, in Croatia, there is the Open License, and in the United Kingdom, there is the Open Government License. One of the practical aspects is that there are several open licensing frameworks worldwide. Two widely used frameworks are the Creative Commons suite and the Open Data Commons licenses.

New data licensing models emerge on a daily basis. Some new licenses claim to be open in principle but are not well-known enough in practice and lack adequate community oversight, as is the case with more established licenses like Creative Commons licenses. Over the past two decades, these licenses have gained widespread use and have proven to be a robust and effective means of managing rights to digital content, which may not necessarily be the case with new and lesser-known licenses.

Furthermore, open licenses that are not legally compatible with each other can create data silos in a legal sense. In principle, a data silo is a data repository controlled by a department or business unit and isolated from the rest of the organization. Segregated data is typically stored in a separate system and often incom-

patible with other datasets. This makes it difficult for users in other organizations to access and use the data. Therefore, it would be reasonable to use widely adopted licenses that are well-known and understood by the broader user community.

In addition to choosing the appropriate license, it is essential to consider the interoperability of licenses. Data users and providers should strive for compatibility between different licenses to avoid creating fragmented data silos. By adopting standardized and widely recognized licensing frameworks, organizations can facilitate the seamless sharing and integration of data across various platforms and jurisdictions. The establishment of clear licensing practices and fostering a culture of openness and collaboration will ultimately contribute to unlocking the full potential of open data and driving innovation in both the public and private sectors.

2.3 Creative Commons licenses

About Creative Commons licenses

Creative Commons licenses have emerged as a powerful tool in the realm of open data, providing a flexible and standardized framework for sharing and licensing creative works. These licenses play a crucial role in promoting the principles of openness, collaboration, and accessibility in the digital age. While initially designed for works of art, literature, and other creative expressions, Creative Commons licenses have found extensive use in the open data community, facilitating the dissemination and reuse of datasets. At their core, Creative Commons licenses enable content creators to retain certain rights while granting permissions to others. These licenses operate within the existing framework of copyright law, offering a more permissive alternative to traditional "all rights reserved" copyright protection. By providing a range of standardized licenses with different permissions and restrictions, Creative Commons has made it easier for individuals, organizations, and governments to share their creative works, including open data, in a more accessible and understandable manner.

In the context of open data, Creative Commons licenses serve as a means to make datasets freely available for use, reuse, and redistribution, subject to specific conditions outlined by the chosen license. These licenses allow data providers to define the terms under which their data can be accessed, modified, combined, and shared by others. They empower data creators to strike a balance between openness and control, granting certain freedoms to users while preserving attribution and ensuring the integrity of the data. Creative Commons licenses provide a standardized and recognizable way of signalling the openness and permissions associated with a dataset. They offer a clear and concise set of legal terms that both data providers and users can easily understand and comply with. By adopting Creative Commons licenses for open data, data providers contribute to a global ecosystem of interoperable and reusable datasets, facilitating collaboration, innovation, and knowledge exchange.

The adoption of Creative Commons licenses for open data aligns with the principles of the open movement, promoting transparency, accountability, and openness in the sharing of information. It encourages the free flow of data, enabling researchers, developers, entrepreneurs, and other users to access and utilize datasets for various purposes, ranging from academic research and policy analysis to the development of applications, services, and visualizations.

Creative Commons licenses have become an integral part of the open data landscape, offering a standardized and user-friendly approach to licensing and sharing creative works, including datasets. These licenses empower data providers to define the permissions and conditions under which their data can be accessed and used, while facilitating the reuse and collaboration that are fundamental to the open data movement. By leveraging Creative Commons licenses, the open data community can foster a culture of openness, collaboration, and innovation, unlocking the full potential of data for the benefit of society.

Types of Creative Commons licenses

Creative Commons licenses are available in several different types, each offering a unique combination of permissions and restrictions.

The Creative Commons suite consists of six standard licenses and a public domain dedication mark (CC0. CC Zero).



The "Attribution" license (CC-BY) allows for unlimited use, processing, and distribution of the dataset, with the requirement of attributing the original dataset's source. This license is recommended for publishing open data and enables widespread usage while ensuring proper credit is given to the creator. Other license types may be used if there are specific considerations related to the datasets. This type of license is suitable when you want to maximize the openness of your dataset and encourage its widespread use and dissemination. It is commonly used for scientific research datasets, government data, or educational resources. For example, a research institution publishing a dataset containing climate data may choose the CC-BY license to allow researchers, educators, and the public to freely access and analyse the data, as long as proper attribution is given.



The "Public Domain Dedication" license (CC0) enables unrestricted use, processing, and

distribution of open datasets without any conditions. It explicitly waives all rights and allows for complete freedom in using the dataset. This license is often used for cultural heritage materials, historical records, or publicly funded research data. For instance, a museum digitizing its collection of artworks may opt for the CC0 license to enable unrestricted access and use of the images by researchers, artists, or anyone interested in studying or reusing the artworks.



The "Public Domain" license (Public Domain) also allows for unrestricted use, processing,

and distribution of datasets without any limitations, achieved through the expiration or relinquishment of existing copyright rights. This license is commonly used for historical documents, government reports, or ancient manuscripts that are no longer subject to copyright protection. For example, an archive of out-of-copyright photographs may choose the Public Domain license to clarify that the images can be freely used by anyone without restrictions.



The "Attribution-ShareAlike" license (CC-BY-SA) imposes the same usage conditions as the "Attribution" Creative Commons license, with the additional requirement that any deriva-

tive work based on the dataset must be shared under the same conditions as the original dataset. This license is often used for collaborative projects, open-source software, or community-driven databases. For instance, a collaborative mapping project might employ the CC-BY-SA license to enable contributors to freely add, edit, and share geographic data, while ensuring that any derived datasets or maps are also openly licensed.



The "Attribution-NoDerivatives" license (CC-BY-ND) permits the use and distribution of the dataset under the specified license conditions, with the obligation to attribute the original dataset's source. The dataset must remain intact and unmodified. This license is commonly used for datasets that require strict preservation of their original form, such as legal documents, official statistics, or sensitive research data. For example, a government agency publishing a dataset of official population statistics may choose the CC-BY-ND license to ensure that the data remains accurate and unchanged when used by journalists or researchers.



The "Attribution-NonCommercial" license (CC-BY-NC) allows for the use, processing, and distribution of the dataset under the specified license conditions, with the requirement to attribute the original dataset's source, as long as the operations performed on the dataset are for non-commercial purposes. This license is commonly used for educational materials, personal projects, or creative content that is not intended for commercial exploitation. For instance, a photographer sharing a dataset of high-resolution images may select the CC-BY-NC license to grant individuals the right to use the images for non-commercial purposes, such as personal blogs or educational presentations.



The "Attribution-NonCommercial-ShareAlike" license (CC-BY-NC-SA) permits the use, processing, and distribution of the dataset under the specified license conditions, with the obligation to attribute the original dataset's source, and as long as the operations performed on the dataset are for non-commercial purposes. Additionally, any derivative work must be shared under the same conditions as the original dataset. This license is often used for collaborative educational resources, community-generated databases, or open content platforms. For example, a group of educators developing an open educational resource may choose the CC-BY-NC-SA license to encourage collaboration, ensuring that improvements or adaptations to the resource are shared back with the community under the same licensing terms.

The "Attribution-NonCommercial-NoDerivatives" license (CC-BY-NC-ND) allows for the use and distribution of the dataset under the specified license conditions, with the obligation to attribute the original dataset's source, as long as the dataset remains intact and unmodified and all operations performed on the dataset are for non-commercial purposes. This license is commonly used for sensitive or proprietary data, personal writings, or confidential research findings. For example, a company sharing a dataset containing proprietary market research data may opt for the CC-BY-NC-ND license to limit access to non-commercial use only and prohibit any modifications or derivative works. These various Creative Commons licenses provide flexibility in choosing the appropriate level of openness, usage restrictions, and sharing requirements for open data. They allow creators to communicate their intentions and enable others to understand how they can use and build upon the licensed datasets, fostering collaboration and the growth of open data communities. These licenses can be combined in various ways to create custom licenses that suit specific needs. For example, a data provider may choose to apply a combination of CC BY and CC BY-SA licenses to different datasets based on their desired level of openness and sharing requirements. It's important to note that Creative Commons licenses are intended to be human-readable and machine-readable, making it easier for both humans and automated systems to understand the permissions and restrictions associated with a licensed work. This promotes transparency, fosters collaboration, and enables the widespread sharing and reuse of creative works, including open data.

License interoperability and compatibility

Creative Commons licenses are designed with interoperability in mind, providing a standardized framework for sharing and licensing creative works, including data. The licenses are built upon a set of common principles and permissions that facilitate the compatibility and interoperability of licensed content. One key aspect of Creative Commons licenses that promotes interoperability is their use of standard legal terms and language. The licenses clearly define the permissions, restrictions, and obligations associated with the use of licensed data, making it easier for data users and developers to understand and comply with the terms. This clarity and consistency in licensing terms across different datasets contribute to the interoperability of open data.

Additionally, Creative Commons licenses offer some license compatibility mechanisms that enhance interoperability. These mechanisms enable licensed works to be combined or adapted with other works that have different Creative Commons licenses, creating a more interconnected and collaborative open data ecosystem. The most notable compatibility mechanism is the "ShareAlike" provision, found in licenses such as CC-BY-SA. This provision requires that derivative works based on a licensed dataset be released under the same or a compatible license. By promoting the adoption of similar licenses, interoperability is facilitated, as datasets can be freely combined and integrated while ensuring consistency in licensing terms. License compatibility when adapting multiple pre-existing works is another important aspect to consider. In this context, it is often referred to as "remixing." If someone is using multiple datasets, it is highly beneficial if the licenses of those datasets are consistent and legally interoperable. For example, if you want to integrate multiple datasets into one, you will want to know if the license restrictions allow you to do so, and what limitations apply if you wish to further share the newly created dataset. You would want to determine whether the licenses are mutually interoperable. The following remix chart can serve as a useful tool in such situations. To utilize the chart effectively, locate the license applicable to one of the works in the left column and the license applicable to the other work in the top right row. If there is a check mark in the box where the row and column intersect, it signifies that the works under those two licenses can be remixed. Conversely, if there is an "X" in the box, it indicates that the works cannot be remixed unless there is an applicable exception or limitation.

	PUBLIC DOMAIN		© 0	CC 00			CO CO BY NO SA	000 57 MC ND
PUBLIC DOMAIN	~	-	-	 Image: A second s	\checkmark	×	-	×
	>	-	-	 Image: A second s	-	×	 Image: A second s	×
C () "	>	-	-	~	-	×	-	×
	>	-	-	\checkmark	×	×	×	×
	>	-	-	×	~	×	~	×
	×	×	×	×	×	×	×	×
BY NC SA	-	-	-	×	-	×	-	×
	×	×	×	×	×	×	×	×

Figure 9 CC remix chart (source: creativecommons.org)

How to choose appropriate Creative Commons license

This section will assist you in navigating the complexities of choosing a Creative Commons license for your public open data. As the demand for open data continues to grow, selecting the right license is crucial to ensure proper usage, attribution, and collaboration. This chooser will provide you with a clear roadmap to selecting the most suitable Creative Commons license for your public open data.



Figure 10 Creative Commons license chooser

2.4 Alternative types of licensing

Open Data Commons

Open Data Commons (ODC) licensing refers to a set of licenses specifically designed for open data. ODC licenses provide a legal framework that allows data providers to share their data with others while establishing clear terms and conditions for its use, reuse, and redistribution. These licenses aim to promote openness, collaboration, and the free flow of data by enabling users to access, modify, and share the licensed data. ODC licenses are built upon established principles of open licensing, focusing on providing permissions and restrictions that balance the needs of data providers and users. These licenses are designed to be easy to understand, implement, and comply with, ensuring clarity and legal certainty in the use of open data. There are several types of Open Data Commons licenses. Open Data Commons Attribution License (ODC-BY) allows users to freely use, distribute, and modify the licensed data, provided that they give appropriate credit to the data provider. Open Data Commons Open Database License (ODbL) is specifically designed for databases. It permits users to access, use, and share the database, including making modifications, as long as they attribute the original data source and share any derivative works under the same license. Open Data Commons Public Domain Dedication and License (PDDL) allows data providers to waive all rights and dedicate their data to the public domain, effectively releasing it from copyright restrictions. Users can freely use, modify, and distribute the data without any attribution requirements. Open Data Commons licenses provide a range of options for data providers to choose from, depending on their desired level of openness and control over their data. The licenses promote collaboration, innovation, and the responsible use of open data by establishing clear legal frameworks that govern its use and redistribution.

National licenses

National licenses are a way for governments to establish specific terms and conditions for the use, reuse, and redistribution of open data within their jurisdiction. These licenses provide a legal framework that governs the rights and obligations of both data providers and data users. The creation of a national license on open data allows an administration to tailor the licensing terms to align with its legal system, cultural context, and policy objectives. It provides a mechanism for the government to promote transparency, accountability, and innovation by defining the rights and permissions associated with accessing and utilizing public sector information. A national open data license typically includes provisions related to the scope of permitted use, attribution requirements, redistribution rights, and any restrictions or limitations that may apply. The license may also address issues such as data quality, privacy concerns, and the liability of data providers.

address issues such as data quality, privacy concerns, and the liability of data providers. By implementing a national open data license, an administration can establish a standardized approach to open data licensing across government agencies and public sector entities. This consistency facilitates data sharing, promotes interoperability, and simplifies the process for data users to understand and comply with the licensing terms.

Furthermore, a national open data license can help build trust and confidence among data users, as it provides a clear legal framework for accessing and utilizing open data. It signals the government's commitment to openness, encourages data sharing and collaboration, and fosters the development of innovative applications and services that leverage open data.

Several examples of national open data licenses include Open Government License (United Kingdom), Licence Ouverte (France), Otvorena dozvola (Croatia).

The creation of a national license on open data enables an administration to define the terms and conditions for the use of public sector information. It promotes transparency, facilitates data sharing, and encourages innovation by providing a clear legal framework for accessing and utilizing open data within the administration's jurisdiction.

2.5 Good practice examples in Europe

Across Europe, governments and organizations are recognizing the immense value of open data and are implementing robust licensing frameworks to facilitate its widespread use and reusability. Open data licenses serve as a foundation for promoting transparency, innovation, and collaboration by providing clear permissions and conditions for the use, distribution, and modification of datasets. In this section, we explore some examples of good practices in open data licensing in Europe. These examples showcase the diverse approaches and innovative strategies employed to foster a culture of openness, enabling individuals, businesses, and communities to harness the power of data for social, economic, and technological advancements.

European Commission

The European Commission is setting a commendable example in the realm of open data licensing by implementing an 'Open Data' policy that promotes the reuse of its public sector information. To facilitate this, the Commission has adopted a Decision31 on the reuse of its documents, which enables both non-commercial and commercial reuse without burdensome processes or charges.

Under this decision, the European Commission allows for the reuse of its content without imposing conditions or discriminating between re-users. It is important to note that certain categories of content are not covered by this decision. These include software or documents protected by industrial property rights, documents subject to third-party intellectual property rights, and documents governed by rules granting privileged access.

To ensure clarity and consistency in licensing, the decision establishes two default Creative Commons licenses for Commission content.

The first is the Creative Commons Attribution 4.0 International Public License (CC BY 4.0), which applies to all types of content such as documents and data. Re-users are required to acknowledge the source but should not imply that the Commission endorses their use of the content.

CC BY 4.0 is:, therefore:

- Universal: it is conceived to be applicable to all documents (at the choice of the licensor);
- Unrestricted: generally speaking, the only condition is attribution;
- Simple: there is no need for an application and it is user-friendly;
- Cost-free: the text of CC-BY does not require payment of fees; •
- Non-discriminatory: terms of CC-BY are open to all potential actors in the market; •
- Transparent: the text of the licence is publicly available, accompanied by supporting documents, guidelines and other material in multiple languages.

The second default license is the Creative Commons Universal Public Domain Dedication (CC0 1.0), which specifically applies to raw data, metadata, or similar documents. This license effectively places such content in the public domain, allowing users to freely utilize it without any additional requirements or obligations.

By adopting these licensing measures, the European Commission demonstrates its commitment to openness and encourages the wider reuse of its valuable public sector information. This approach not only fosters transparency and accountability but also promotes innovation and collaboration by empowering individuals, businesses, and organizations to leverage Commission data in the development of added-value information products and services.

Croatia

Croatia has introduced its own open license known as "Otvorena dozvola³²" or "Open License" in English. Aligned with the principles of open data, this license aims to facilitate the sharing and utilization of data within Croatia. Importantly, the Otvorena dozvola is fully compatible with the widely recognized Creative Commons Attribution (CC-BY) license.

The Otvorena dozvola provides a legal framework that grants permissions and establishes the conditions under which data can be accessed, processed, and distributed. By employing this license, data providers in Croatia are able to grant users the necessary rights to utilize the data while ensuring compliance with intellectual property and data protection regulations.

With the Otvorena dozvola, users have the freedom to freely use, modify, and distribute datasets, enabling a wide range of individuals, organizations, and businesses to leverage the data for their needs. The license promotes collaboration, encourages innovation, and fosters the development of new products and services. An essential aspect of the Otvorena dozvola is the requirement of proper attribution. Users are obliged to acknowledge the data provider when utilizing the licensed data, ensuring transparency and giving credit where it is due.

One significant advantage of the Otvorena dozvola is its compatibility with the CC-BY license. This compatibility allows for the combination and integration of datasets licensed under the Otvorena dozvola with those under the CC-BY license. Such compatibility expands the possibilities for data reuse and fosters collaboration on a broader scale.

By embracing this license, Croatia facilitates the sharing of data, enabling individuals and organizations to harness its potential for societal, economic, and research purposes.

France

The French License Ouverte³³, also known as the Open License, is a national open data license introduced by the French government. It is designed to facilitate the sharing and reuse of public sector information in France. The license promotes open access to data, encouraging innovation, transparency, and the creation of value-added services.

The License Ouverte is fully compatible with Creative Commons licenses, particularly the Creative Commons Attribution (CC-BY) license. This compatibility allows for the interoperability and integration of data released under the French License Ouverte with data released under CC-BY licenses. It enables data users to combine, remix, and build upon datasets from different sources, thereby fostering collaboration and expanding the potential for data-driven innovation.

By aligning with Creative Commons licenses, the License Ouverte ensures that data users can benefit from established principles and practices in the open data community. It provides a clear legal framework for the use, adaptation, and redistribution of data, while also requiring proper attribution to the data provider. The compatibility between the License Ouverte and Creative Commons licenses encourages the exchange of data and knowledge across international boundaries. It facilitates cross-border collaborations and enables the pooling of resources and expertise from different jurisdictions. This interoperability promotes the growth of a global open data ecosystem and encourages the development of innovative solutions that can address shared challenges.

Luxembourg

The Luxembourg government encourages the publication of open data in accordance with specific guidelines³⁴. These quidelines promote the use of licenses from the Creative Commons family, with a particular emphasis on the Creative Commons Zero (CC0) license. The CC0 license is considered the preferred option as it aligns with the principle of "no copyright reserved" in the Creative Commons toolkit. By choosing the CC0 license, data providers effectively waive all copyright and similar rights they hold in a work, dedicating those rights to the public domain.

In line with this preference, Luxembourg's open data publication guidelines aim to facilitate the release of data in a manner that supports openness, accessibility, and unrestricted reuse. The government recognizes the importance of relinquishing copyright and related rights to encourage widespread use and promote the broadest possible access to open data.

Through the application of the CC0 license, data providers in Luxembourg demonstrate their commitment to making data freely available to the public without restrictions. This license allows users to freely use, adapt, and distribute the data for any purpose, including commercial activities, without the need for explicit permission or payment.

Netherlands

In the Netherlands, the licensing of open public data is predominantly governed by the government's decision to adopt the "Creative Commons 1.0 Universal (CC0 1.0) Public Domain Dedication" as the primary license for making data openly available³⁵. This decision reflects the government's commitment to promoting transparency, innovation, and economic growth through the unrestricted use and reuse of public sector information.

The CC0 license, widely utilized by Dutch government institutions and organizations, enables the release of data into the public domain, granting users the freedom to use, adapt, and redistribute the data without encountering legal barriers or restrictions. By applying the CC0 license, the Dutch government encourages a thriving open data ecosystem, facilitating collaboration, knowledge sharing, and societal benefits. Under the CC0 license, the data provider relinquishes all copyright and related rights to the fullest extent permitted by law. This grants individuals, businesses, and organizations the freedom to utilize the data without the need for attribution or compliance with licensing conditions. The adoption of the CC0 license ensures that public sector data can be leveraged for various purposes, including commercial activities, research endeav-

https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=58807

³¹ 32 https://narodne-novine.nn.hr/clanci/sluzbeni/2017 07 67 1577.htm

https://www.etalab.gouv.fr/licence-ouverte-open-licence/ 33 https://data.public.lu/en/pages/publishing/ 35

ours, and technological advancements.

While some government institutions and organizations in the Netherlands may have specific licensing frameworks or policies for certain datasets, the overarching trend is to embrace open licenses.

Slovenia

In Slovenia, the licensing of open data is regulated by legal provisions that adhere to the principles of a free open license³⁶. This license requires the attribution of the data source when reusing the data. Among the list of standard licenses developed by the Creative Commons organization, this specific license is marked as CC-BY (Creative Commons Attribution 4.0 International Public License).

The adoption of the CC-BY license highlights Slovenia's commitment to open data and facilitates the dissemination and use of public sector information. This license allows individuals and organizations to freely use, share, and build upon the data under the license, including for commercial purposes, while ensuring proper attribution. By enforcing the CC-BY license, Slovenia promotes transparency, collaboration, and the development of innovative solutions based on open data.

It is recommended that when publishing data on the organization's portal, the text of the license includes standardized licenses, such as the Creative Commons License. This ensures clarity and consistency in license labels, making it easier to understand the rights and conditions for the use of open data.

2.6 Recommendations for licensing

It is crucial to understand the significance of licensing open data. By implementing clear and consistent licensing practices, governments can promote transparency, foster innovation, and enable the reuse of data for various purposes.

Western Balkan (WB) administrations, can consider a common approach to licensing data. This will facilitate interoperability and collaboration within the region, allowing for seamless data sharing and exchange.

The existence of Creative Commons licenses provides a valuable framework for licensing open data. WB administrations should consider adopting and promoting the use of Creative Commons licenses, such as CC-BY (Creative Commons Attribution) or CC0 (Creative Commons Zero), which facilitate easy and standardized reuse of data while ensuring proper attribution or dedication to the public domain.

WB administrations have also the opportunity to create their own national licenses for open data. When developing national licenses, it is advisable to ensure compatibility with widely recognized Creative Commons licenses (CC-BY or CC0). This compatibility will enhance interoperability with existing frameworks and facilitate data sharing and collaboration at both national and international levels.

WB administrations can draw inspiration from successful practices in Europe. Some European administrations have adopted Creative Commons licenses (CC-BY or CC0) as standard licenses for open data. Others have developed their own national licenses that align with Creative Commons licenses, ensuring compatibility and fostering a harmonized approach to licensing open data.

Montenegro, for instance, according to the Open Data Maturity 2022 questionnaire, has provided recommendations to use the CC-BY license, while the open data portal in Serbia licenses its content under the Open License 2.0³⁷. These examples highlight the importance of following established licensing frameworks to ensure clarity, consistency, and compatibility in open data initiatives.

By implementing these recommendations, WB administrations can establish a solid foundation for licensing open data, enabling the free flow of information, encouraging innovation, and maximizing the potential societal and economic benefits of open data initiatives.

SECTION 3 - REVIEW OF OPEN DATA PORTALS

3.1 Introduction

In the programme envisaged for 2023-2025 ReSPA will focus on benefits of data driven administrations and more specifically to importance of using data and open data for knowledge-based economy and Open Government Partnership initiative. The focus will be on addressing common issues at policy and operation levels while providing the support for ensuring the commitment from the policy level. Cross border potentials and possible impact of exchanging open data between ReSPA Members administration open data providers will be especially addressed through specific Open data challenges. This document includes review of open data portals in ReSPA Members. The Methodology for review of open data portals is fully aligned with the methodology used for examining the features and functionalities of the national open data portals as in the Open Data Maturity Report 2022, which is conducted by the European Commission. The report, apart from the 27 EU Member States also includes Albania, Montenegro, Serbia and Bosnia and Herzegovina. Results for North Macedonia are not available in the 2022 survey, but they are estimated since necessary input was provided by the relevant stakeholders. The review provides the overview of which of available datasets at each open data portal are of high-quality and high-value, which would be an input for the envisaged Open data regional challenge. This is connected to the EU Open Data Directive (Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information which identifies specific areas of high-value datasets that member states should prioritize for open data publication. These high-value datasets are considered particularly valuable for promoting transparency, innovation, and economic growth. Adopted by the European Commission in December 2022, the Implementing Act on High-value Datasets aims "to make more publicly-funded information available for new information products and innovation, in particular in artificial intelligence". The crux of the High-value Datasets Act is making information accessible, reusable, and useful through open data.

More specifically, high-value datasets include:

- Geodata: INSPIRE themes, reference parcels, and agricultural parcels.
- information directive, and datasets related to select legal acts.
- Meteorology: Observation measurement data (weather stations), climate data, weather warnings, radar data, NWP model data.
- Statistics: Statistical data on select legal acts.
- Mobility: INSPIRE themes and River Information Services data.
- Business-related data: Basic company information, records, and financial statements.

The review also entails the "smart" recommendations applicable to all public administrations or/and where applicable for each specific public administration for improving overall score in all 4 dimensions of Open Data Maturity questionnaire - policy, impact, portal and quality.

Earth Observation Data: INSPIRE themes, environmental information according to the environmental

3.2 Review of open data portals

Albania

Portal availability

The national open data portal, accessible at <u>https://opendata.gov.al</u>, provides users with access to a comprehensive collection of datasets available in both Albanian and English languages. With a total of 91 datasets, the portal offers a diverse range of information that is conveniently sorted into 15 categories. Additionally, users have the option to browse datasets based on the specific government institution responsible for their publication.



Figure 11 Open data portal of Albania

In addition to the open data portal, the Government of the Republic of Albania has launched another dedicated platform specifically focused on the Open Government Partnership (OGP). This platform, accessible at <u>https://ogp.gov.al/en/</u>, serves as a valuable resource for users seeking information on Albania's OGP National Action Plan. By visiting this portal, users can access relevant documents, updates, and insights related to the administration's commitment to open governance and transparency initiatives.

Features and functionalities

In this part, we delve into the features and functionalities of the Albanian Open Data Portal, evaluating its performance and capabilities in line with the principles outlined in open data maturity assessment reports. The portal serves as a central hub for accessing a diverse range of datasets published by government agencies and public institutions in Albania. By examining its key attributes, it is important to refer to answers to the questions from Open Data Maturity Report 2022 concerning portal features, portal usage, data provision and portal sustainability.

		B 1 4
Question	Answer	Points
Portal features		100
Is there a national portal in your country for making open data dis- coverable?	yes	20
Does the national portal offer an advanced data search function (multiple field search, filter options etc.)?	yes	10
Does the national portal offer the possibility for users to download datasets (e.g., via a link)?	yes	10
Does the national portal offer the possibility for users to search by file format?	yes	10
Does the national portal offer the possibility for users to search by data domain?	no	0
Does the national portal offer to its users a way to programmatically query the metadata (e.g., via an API or a SPARQL access point)?	no	0

Does the national portal offer documentation on the use other tools that enable working with the aforementioned Does the national portal enable users to provide conten tal (e.g., to link documentation and supporting materia dataset)?

Does the national portal offer a general feedback me users (e.g., a "Contact us" or "Feedback" button that is visible spot on the portal and would allow users to ser comment concerning the portal)?

Does the national portal offer a feedback mechanism at el? (e.g., a "feedback button" or a comment/ discus under the dataset)?

Does the national portal provide a mechanism for users sets?

Does the national portal enable users to find information on relevant open data topics in the country?

Does the national portal offer the possibility for users to tifications when new datasets are available on the na (RSS, ATOM feeds, email notifications etc)?

Does the national portal offer the possibility for user datasets?

If yes, what is the frequency of these requests?

Are these requests and their progress status presente parent manner on the national portal?

Does the team monitor the extent to which requests (e portal or otherwise) result in the publication of the request fyes, to what degree do these requests result in the p the requested data?

Does the national portal include a discussion forum of exchange possibility for users (whether data providers of Does the national portal have a designated area to sh cases?

Does the national portal reference the datasets that the use cases are based on?

Does the national portal provide the possibility for use their own use cases?

Does the national portal offer a preview function for tab Does the national portal offer a preview function for geos Are you preparing to promote the publication of high-va on your national portal (e.g., by adding filtering feature features, changes to navigation)?

Portal usage

Is the national portal mobile as responsive as the deski Do you monitor the portal's traffic (e.g., in terms of numb visitors, visitor profiles, percentage of machine traffic downloads according to the number of datasets etc.)? Are traffic and usage statistics used to better understan haviour and needs and to update the portal accordingly Do you perform further activities to better understand haviour and needs (e.g., web analytics, surveys, or an cial media feeds)?

What is the typical profile of the portal visitor, as learned ties such as web analytics, surveys, or social media an Does this profile match the type of audience your na wants to cater to?

How many unique visitors visit the national portal on month?

What percentage of the unique visitors to the national eign?

Do you monitor what keywords are used to search for d tent on the portal?

Do you monitor the most and least consulted pages?

e of APIs and d metadata?	no	0
nt for the por- ls to a given	yes	0
echanism for s placed in a nd a general	yes	10
t dataset lev- sion section	no	0
to rate data-	no	0
on and news	no	0
o receive no- ational portal	no	0
s to request	no	0
		0
ed in a trans-	no	0
either via the ested data?	no	0
oublication of	/	0
or any other or re-users)?	no	0
nowcase use	no	0
e showcased	no	0
ers to submit	no	0
ular data?	yes	10
spatial data?	yes	10
alue datasets res, editorial	yes	20
		105
top version?	yes	10
per of unique , number of	yes	15
nd users´ be- /?	no	0
d users´ be- alysis of so-	no	0
d from activi- alvses?	a bit of every- thing	10
ational portal	yes, entirely	10
average per	l don't know	0
portal is for-	l don't know	0
ata and con-	yes	10
	yes	10

What data categories are the top 5 most frequently consulted on the portal, with 1 being the most popular one?	1=Economy and finance, 2 = H e a I t h , 3=e-Albania, 4=Transport, 5= Education	10
What datasets are the top 5 most frequently consulted on the portal, with 1 being the most popular one?	1=Treasure, 2=List of Med- icine, 3=List of e-services in e-Albania, 4=List of re- imbursable medicines, 5= Budget	10
Do you take measures to optimise the search and discoverability of content (data and editorial)?	yes	10
Is the metadata on your portal available in clear plain language to enable both humans and machines to read and understand it?	yes	10
Do you run analytics on API usage, if metadata describing the data- sets is accessible via an API?	no	0
If yes, what percentage of outgoing portal traffic is generated by API usage only?	no	0
Data provision		48
To what degree do public sector data providers contribute data to the portal?	Approximate- ly half of the public sector data provid- ers	8
Do you identify the data providers that are not yet publishing data on the national portal?	yes	10
Were there concrete actions taken to assist these data providers with their publication process?	yes	10
Besides the national open data portal, are there other regional and local portals?	https://e-alba- nia.al/	0
Are regional and local portals listed above and their data sources discoverable via the national portal?	no	0
If yes, to what degree are existing regional and local sources har- vested automatically?		0
Does the national portal include datasets that are real-time or dy- namic?	yes	10
If yes, what percentage of metadata links to such data?	11-20%	0
Does the national portal provide a separate section where non-of- ficial data (not stemming from official sources, such as communi- ty-sourced/citizen-generated data) can be published?	no	0
Do you have an overview of the data providers (official and non-official) on your national portal?	yes	10
Does the national portal allow users to see what data exists but can- not be made available as open data?	no	0
Portal sustainability		50
Does the national portal have a strategy to ensure its sustainability?	no	0
Does this strategy include a description of the portal's target audi- ence and measures to reach this audience?		0
Is your national portal active on social media?	yes	10
Do you take actions to promote the national portal's activities and the available open data (e.g., regular info sessions and/or events)?	yes	15
Are the portal's source code as well as relevant documentation and artifacts made available to the public (e.g., on platforms such as GitHub or GitLab)?	no	0
Was there a user satisfaction survey concerning the national portal conducted in the past year?	yes	10

Is there a process by which the portal is reviewed a regularly?

If yes, what is the frequency of these reviews?

If yes, is the users' feedback considered in the review Do you monitor via a dashboard the characteristics of t lished on the portal, such as the distribution across cate vs. real-time data and how these change over time? Does this monitoring enable the portal team and/or da to take action to improve their performance on the nation TOTAL

Table 4 Open Data Maturity 2022 - Open Data Portal dimension score for Albania

The Albanian open data portal has achieved a score of 303 out of a possible 650, indicating a moderate level of maturity in 2022 in dimension relating to the portal. The assessment questionnaire reveals that the portal currently encompasses most of the necessary features, demonstrating a solid foundation for open data publication and access. However, there is room for improvement by incorporating additional features and functionalities, as highlighted in the Recommendations section of this report. Aligned with the OGP (Open Government Partnership) Action Plan for Albania, one of the commitments aims to enhance the volume and quality of open data available on the portal. This commitment underscores the importance of continuous improvement in both the quantity and quality of datasets published on the open data portal. It also emphasizes the need to enhance the portal itself, ensuring it remains user-friendly, efficient, and capable of accommodating evolving user needs.

High-value datasets availability

Although it was not possible to identify specific high-value datasets with quality covered by the High-value Dataset Act, there are several potential datasets that could hold significant value, including the following:

Thematic area	Dataset	Link
Business-relat- ed data	Registered business by regions	https://opendata.gov.al/?item=bizne- set-e-regjistruara-sipas-qyteteve
Business-relat- ed data	Registered business by nationality	https://opendata.gov.al/?item=bizne- set-e-regjistruara-sipas-kombesise
Business-relat- ed data	Registered business by legal form	https://opendata.gov.al/?item=bizne- set-e-regjistruara-sipas-formes-ligjore
Education	List of high schools and primary schools	https://opendata.gov.al/?item=shkol- lat-e-mesme https://opendata.gov. al/?item=lista-e-shkollave
Education	Data for the education system	https://opendata.gov.al/?item=te-dhe- na-per-sistemin-arsimor
Finance	Budget	https://opendata.gov.al/?item=buxheti
Health	List of Medicine	https://opendata.gov.al/en?item=lis- ta-e-barnave
Health	Health Centres	https://opendata.gov.al/?item=qen- dra-shendetesore
Public Safety	Police Stations	https://opendata.gov.al/?item=ra- jone-policie

Table 5 Potential high-value datasets in Albania

Recommendations SHORT TERM RECOMMENDATIONS

To ensure compliance with the Open Data Directive, it is recommended to prioritize the implementation of the directive's provisions into national law, thereby establishing a legal framework that mandates open data publication and reuse. NOTE: The law has been adopted during 2022 and implemented Open Data Directive - after answering the questionnaire.

nd improved	yes	15
	less frequent- ly	0
process?	yes	0
he data pub- gories, static	no	0
ata providers onal portal?	no	0
-		303

To promote open data adoption and awareness, it is advisable to organize at least two dedicated **events**, one targeting public institutions to encourage data publication, and another aimed at engaging potential re-users to showcase the benefits of utilizing open data.

To enhance the functionality of the open data portal, several **key features should be considered for implementation**, including a feedback mechanism and dataset rating system to gather user input, the integration of a portal API/SPARQL endpoint for enhanced data access, the inclusion of a dataset request mechanism to facilitate data availability, and the incorporation of use cases and statistics to demonstrate the value of open data.

To foster transparency and collaboration, it is recommended to **publish the source code** of the open data portal, allowing for community contributions, peer review, and the potential for customization and improvement.

To establish clear guidelines for data reuse, it is advisable to define an appropriate **licensing** framework. The adoption of a Creative Commons recommended license or a national license compatible with Creative Commons principles is encouraged to enable easy and standardized data reuse.

To ensure the long-term sustainability of the open data portal, it is essential to **connect the open data strat**egy with the portal's sustainability efforts, incorporating relevant considerations and indicators into future assessments and questionnaires.

LONG TERM RECOMMENDATIONS

To encourage local and regional open data initiatives, it is important to **provide support and facilitate collaboration** by establishing partnerships with local governments, organizations, and communities to encourage data publication and promote open data practices at various levels.

Regularly **exchanging knowledge and experiences with re-users**, such as researchers, developers, and entrepreneurs, can foster innovation and identify potential areas for improvement. Organizing workshops, meetups, and forums for knowledge sharing would be beneficial in this regard.

Ensuring **DCAT-AP** (Data Catalogue Vocabulary for the European Data Portal) **compliance** on the open data portal is crucial to promote interoperability and seamless data exchange within the European open data ecosystem. Adopting and adhering to the DCAT-AP standard will enhance discoverability and facilitate data integration.

Developing a comprehensive **analytics measurement framework** for the open data portal is essential to assess its impact and effectiveness. Defining key metrics, such as dataset usage, user engagement, and the development of applications or services based on the available data, will provide valuable insights into the portal's performance and value to the community.

Having a well-defined **open data policy and action plan** can greatly assist in coordinating open data activities more effectively. The policy should outline clear goals, principles, and guidelines, while the action plan should outline specific steps, responsibilities, and timelines for implementation, creating a roadmap for sustained progress and collaboration.

Bosnia and Herzegovina

Portal availability

The national open data portal in Bosnia and Herzegovina was piloted but is currently not publicly available. In addition to the national open data portal, there are several local open data portals available. One notable example is the portal for the city of Prijedor, which provides access to 174 datasets contributed by 18 organizations, which can be accessed at https://opendataprijedor.ba. Furthermore, the county of Tešanj has released five datasets, which can be accessed at https://opcina-tesanj.ba/uprava/uprava/otvoreni-podaci/

Features and functionalities

This section examines the features and functionalities of the national open data portal that were accessible during the completion of the Open Data Maturity 2022 questionnaire. In the open data portal dimension of the questionnaire, Bosnia and Herzegovina achieved a score of 185 out of 650. However, it should be noted that the portal was temporarily offline for maintenance during the evaluation, resulting in missed opportunities to score additional points. While the portal currently incorporates most of the necessary features, there is still room for improvement, as highlighted in the recommendations outlined in this report.

Question

Portal features

Is there a national portal in your country for making discoverable?

Does the national portal offer an advanced data search (multiple field search, filter options etc.)?

Does the national portal offer the possibility for users to datasets (e.g., via a link)?

Does the national portal offer the possibility for users to file format?

Does the national portal offer the possibility for users to data domain?

Does the national portal offer to its users a way to proically query the metadata (e.g., via an API or a SPARC point)?

Does the national portal offer documentation on the us and other tools that enable working with the afore metadata?

Does the national portal enable users to provide contr portal (e.g., to link documentation and supporting mat given dataset)?

Does the national portal offer a general feedback mech users (e.g., a "Contact us" or "Feedback" button that is p visible spot on the portal and would allow users to send comment concerning the portal)?

Does the national portal offer a feedback mechanism level? (e.g., a "feedback button" or a comment/ discution under the dataset)?

Does the national portal provide a mechanism for use datasets ?

Does the national portal enable users to find information on relevant open data topics in the country?

Does the national portal offer the possibility for users notifications when new datasets are available on the na tal (RSS, ATOM feeds, email notifications etc)?

Does the national portal offer the possibility for users datasets?

If yes, what is the frequency of these requests?

Are these requests and their progress status presented parent manner on the national portal?

Does the team monitor the extent to which requests the portal or otherwise) result in the publication of the data?

	Answer	Points
		70
open data	no	0
ch function	yes	10
odownload	yes	10
search by	yes	10
search by	yes	10
ogrammat- QL access	no	0
se of APIs mentioned	yes	10
ent for the terials to a	yes, but offline now	0
hanism for placed in a d a general	yes, but offline now	0
at dataset ission sec-	yes, but offline now	0
ers to rate	no	0
n and news	yes, but offline now	0
to receive ational por-	no	0
to request	yes, but offline now	0
		0
in a trans-	no	0
(either via requested	no	0

or the requested data? 0 Does the national portal include a discussion forum or any other exchange possibility for users (whether data providers or re-users)? 0 Does the national portal have a designated area to showcase use no 0 Does the national portal reference the datasets that the show- no 0 Casses? Does the national portal reference the datasets that the show- no 0 Does the national portal offer a preview function for tabular data? yes, but offline 0 Does the national portal offer a preview function for geospatial yes, but offline 0 now 9 Are you preparing to promote the publication of high-value datasets on your national portal (e.g., by adding filtering features, editrial features, changes to navigation)? 45 Portal usage 10 yes 10 Do you monitor the portal's traffic (e.g., in terms of number of were and usage statics used to better understand users' no 0 0 Do you perform further activities to better understand users' beno 0 0 0 Do you perform further activities to better understand users' beno 0 0 0 Do you perform further activities to better understand users' beno 0 0 0 0 Do you perform further activitites to better understand users' beno 0<	If yes, to what degree do these requests result in the publication		0
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Besides the national open data portal, are there other regional yes, but not 0 yet published	were mere concrete actions taken to assist these data providers with their publication process?	усъ	10
and local portals? yet published	Besides the national open data portal, are there other regional	yes, but not	0
	and local portals?	yet published	

Are regional and local portals listed above and their dat discoverable via the national portal? If yes, to what degree are existing regional and local so vested automatically? Does the national portal include datasets that are real-t namic? If yes, what percentage of metadata links to such data? Does the national portal provide a separate section whe ficial data (not stemming from official sources, such as ty-sourced/citizen-generated data) can be published? Do you have an overview of the data providers (official a ficial) on your national portal? Does the national portal allow users to see what data cannot be made available as open data? Portal sustainability Does the national portal have a strategy to ensure its s Does this strategy include a description of the portal's ta ence and measures to reach this audience? Is your national portal active on social media? Do you take actions to promote the national portal's and the available open data (e.g., regular info session events)? Are the portal's source code as well as relevant docu and artifacts made available to the public (e.g., on platf as GitHub or GitLab)? Was there a user satisfaction survey concerning the na tal conducted in the past year? Is there a process by which the portal is reviewed and regularly? If yes, what is the frequency of these reviews? If yes, is the users' feedback considered in the review p Do you monitor via a dashboard the characteristics of published on the portal, such as the distribution acros ries, static vs. real-time data and how these change over Does this monitoring enable the portal team and/or data to take action to improve their performance on the nation TOTAL

Table 6 Open Data Maturity 2022 - Open Data Portal dimension score for Bosnia and Herzegovina

High-value datasets availability

itv?

Although it was not possible to identify specific high-value datasets with guality covered by the High-value Dataset Act, there are several potential datasets on local level that could hold significant value, including the following:

Thematic area	Dataset	Lin
Business-related	Registry of Business Entities -	http
data	Municipality of Tešanj	yug
Business-related	Registry of Individuals - Mu-	htt
data	nicipality of Tešanj	<u>upl</u>
		<u>ca-</u>
		<u>20T</u>
Finance	Budget Execution for the	<u>http</u>
	Current Year - Municipality of	loa
	Tešanj	dat
Geodata	Spatial plan - city of Prijedor	<u>http</u>
		mer
Meteorology	Climatological Data of the Mu-	<u>http</u>
	nicipality of Tešanj	load
		<u>ci-C</u>
Meteorology	Water level - rivers Sana i	<u>http</u>
	Gomljenica	<u>staj</u>

ta sources	N/A	10
ources har-	N/A	15
time or dy-	no	0
?		0
ere non-of- communi-	no	0
and non-of-	no	0
exists but	no	0
		25
sustainabil-	no	0
arget audi-		0
	no	0
s activities ons and/or		0
umentation forms such	yes	10
ational por-	no	0
l improved	no	0
	less frequently	0
process?	no	0
of the data ss catego- er time?	yes	0
a providers nal portal?	yes	15
		185

1
s://www.dropbox.com/s/evv7xupp8td-
<u>2/sifx8-rnunc.json?dl=0</u>
<u>s://opcina-tesanj.ba/wp-content/</u>
ads/2022/09/Evidencija-fizickih-li-
prijave-Kanita-konacni-2022-04-
15.02.05-1-1.xls
s://opcina-tesanj.ba/wp-content/up-
ls/2022/09/BUDZET-za-otvorene-po-
e-2022-09-09T15.04.11-1.xls
s://opendataprijedor.ba/dataset/doku-
ti-prostornog-uredenja
s://opcina-tesanj.ba/wp-content/up-
s/2023/01/Godisnji-klimatoloski-poda-
pcine-Tesanj.xls
s://opendataprijedor.ba/dataset/vodo-

Meteorology	Noise - city of Prijedor	https://opendataprijedor.ba/dataset/buka
Mobility	Public transport timetable - city of Prijedor	https://opendataprijedor.ba/dataset/pri- gradski-prevoz; https://opendataprijedor.ba/ dataset/prevoznici-putnickog-saobracaja
Mobility Table 7 Potential high-valu	Traffic accidents - city of Pri- jedor ue datasets in Bosnia and Herzegovina	https://opendataprijedor.ba/dataset/saobra- cajne-nezgode

Recommendations

SHORT TERM RECOMMENDATIONS:

To enhance the open data portal in Bosnia and Herzegovina, it is recommended to establish a comprehensive **Law on Open Data or Public Sector Information (PSI)** that provides a legal framework for data openness, reuse, and accessibility. This law will serve as a foundation for promoting transparency, accountability, and effective data sharing practices.

To foster greater engagement and awareness, it is important to gather information on **open data events** and initiatives taking place within Bosnia and Herzegovina. This includes conferences, workshops, and seminars related to open data, where knowledge sharing and best practices can be exchanged among stakeholders. As part of the development process, it is crucial to launch the full version of the **open data portal**, ensuring all planned features and functionalities are implemented and accessible to users. This includes data discovery, download capabilities, visualization tools, and user-friendly interfaces, enhancing the overall user experience. To ensure accurate and comprehensive responses to the open data maturity questionnaire, it is advisable to **seek assistance from experts** or relevant stakeholders with expertise in open data. Collaborating with knowledgeable individuals will help provide accurate insights and responses, enabling a more informed assessment of the portal's maturity level.

LONG TERM RECOMMENDATIONS:

To foster a thriving open data ecosystem, it is important to **support and facilitate local and regional open data initiatives**. This can be achieved by actively engaging with local governments, organizations, and communities to encourage the publication and reuse of open data at the grassroots level.

Regularly **exchanging knowledge with re-users** is crucial to understand their needs, challenges, and successes. By establishing channels for dialogue, feedback, and collaboration, the open data portal can continuously improve its offerings and address the evolving requirements of its user base.

Developing a **methodology to measure analytics on the open data portal** is essential for assessing its impact and effectiveness. By implementing analytics tools and frameworks, such as user engagement metrics, data usage patterns, and impact assessment methodologies, the portal can gain insights into its performance and make data-driven improvements.

The formulation of an **open data policy and action plan** can provide a strategic framework for coordinating and guiding open data activities in Bosnia and Herzegovina. By establishing clear goals, roles, and responsibilities, the policy and action plan can foster collaboration, standardization, and interoperability among various stakeholders, enhancing the overall effectiveness and impact of open data initiatives.

Montenegro

Portal availability

The open data portal of Montenegro, available at https://data.gov.me, provides a comprehensive platform for accessing and utilizing government datasets. It serves as a central hub for data transparency, enabling citizens, researchers, and businesses to explore and analyse a wide range of open datasets. The portal features 197 datasets available from 28 organizations across various sectors, including economy, environment, education, and more.



Figure 12 Open data portal of Montenegro

Features and functionalities

In this section, we examine the features and functionalities of the national open data portal that were accessible during the completion of the open data maturity questionnaire. In the open data portal dimension of the questionnaire, Montenegro achieved a score of 312 out of 650 points. However, it should be noted that during the evaluation of the open data maturity assessment, the portal was temporarily offline. Given the potential gain of at least 200 additional points, the portal could have scored over 500 out of 650, indicating excellent features and usability.

Question

Portal features

Is there a national portal in your country for making op coverable?

Does the national portal offer an advanced data sea (multiple field search, filter options etc.)?

Does the national portal offer the possibility for users t datasets (e.g., via a link)?

Does the national portal offer the possibility for users t file format?

Does the national portal offer the possibility for users t data domain?

Does the national portal offer to its users a way to progr query the metadata (e.g., via an API or a SPARQL acce Does the national portal offer documentation on the use other tools that enable working with the aforementioned Does the national portal enable users to provide conten tal (e.g., to link documentation and supporting material dataset)?

Does the national portal offer a general feedback me users (e.g., a "Contact us" or "Feedback" button that is visible spot on the portal and would allow users to ser comment concerning the portal)?

	CG <u>EN</u>	l Prijav	a Registracija
Početna	Organizacije	Skupovi podata	aka Analitika
		_	
8	Nauka 3 seta	= ;	Obrazovanje 13 setova
â	Rad i socijalno star 29 setova	A	Saobraćaj i pomors i setova
?	Zdravlje 2 seta	2	livotna sredina I setova
		🗎 Kr	eirano 5/20/2022
020.god.		🗎 Kr	eirano 5/20/2022
		🗎 Kr	eirano 5/20/2022

	Answer	Points
		62
en data dis-	yes (URL didn't open)	0
rch function	yes	10
to download	yes	10
to search by	yes	10
to search by	yes	10
rammatically ess point)?	yes (URL didn't open)	0
e of APIs ánd d metadata?	yes (UŔL didn't open)	0
t for the por- ls to a given	yes (UŔL didn't open)	0
echanism for s placed in a nd a general	yes (URL didn't open)	0

Does the national portal offer a feedback mechanism at dataset level? (e.g., a "feedback button" or a comment/ discussion section under the dataset)?	yes (URL didn't open)	0
Does the national portal provide a mechanism for users to rate datasets ?	yes (URL didn't open)	0
Does the national portal enable users to find information and news on relevant open data topics in the country?	no	0
Does the national portal offer the possibility for users to receive notifications when new datasets are available on the national portal (RSS, ATOM feeds, email notifications etc)?	no	0
Does the national portal offer the possibility for users to request datasets?	yes (URL didn't open)	0
If yes, what is the frequency of these requests?	Monthly	0
Are these requests and their progress status presented in a trans- parent manner on the national portal?	no	0
Does the team monitor the extent to which requests (either via the portal or otherwise) result in the publication of the requested data?	yes	10
If yes, to what degree do these requests result in the publication of the requested data?	Majority of datasets	12
Does the national portal include a discussion forum or any other exchange possibility for users (whether data providers or re-users)?	no	0
Does the national portal have a designated area to showcase use cases?	yes (URL didn't open)	0
Does the national portal reference the datasets that the showcased use cases are based on?	yes (URL didn't open)	0
Does the national portal provide the possibility for users to submit their own use cases?	yes (URL didn't open)	0
Does the national portal offer a preview function for tabular data?	yes (URL didn't open)	0
Does the national portal offer a preview function for geospatial data?	yes (URL didn't open)	0
Are you preparing to promote the publication of high-value datasets on your national portal (e.g., by adding filtering features, editorial features, changes to navigation)?	yes (URL didn't open)	0
Portal usage		145
Is the national portal mobile as responsive as the desktop version?	ves	10
Do you monitor the portal's traffic (e.g., in terms of number of unique visitors, visitor profiles, percentage of machine traffic, number of downloads according to the number of datasets etc.)?	yes	15
Are traffic and usage statistics used to better understand users' behaviour and needs and to update the portal accordingly?	yes	10
Do you perform further activities to better understand users' be- haviour and needs (e.g., web analytics, surveys, or analysis of so- cial media feeds)?	yes	10
What is the typical profile of the portal visitor, as learned from ac- tivities such as web analytics, surveys, or social media analyses?	Mostly citi- zens	10
Does this profile match the type of audience your national portal wants to cater to?	yes	10
How many unique visitors visit the national portal on average per month?	1200	10
What percentage of the unique visitors to the national portal is for- eign?	18%	0
Do you monitor what keywords are used to search for data and content on the portal?	yes	10
Do you monitor the most and least consulted pages?	yes	10
What data categories are the top 5 most frequently consulted on the	see answer	10
portal, with 1 being the most popular one? What datasets are the top 5 most frequently consulted on the portal.	box see answer	10
with 1 being the most popular one?	box	-
Do you take measures to optimise the search and discoverability of content (data and editorial)?	yes	10

Is the metadata on your portal available in clear plain enable both humans and machines to read and unders Do you run analytics on API usage, if metadata describi sets is accessible via an API? If yes, what percentage of outgoing portal traffic is gene usage only? Data provision To what degree do public sector data providers contril the portal? Do you identify the data providers that are not yet pub on the national portal? Were there concrete actions taken to assist these data with their publication process? Besides the national open data portal, are there other local portals? Are regional and local portals listed above and their da discoverable via the national portal? If yes, to what degree are existing regional and local s vested automatically? Does the national portal include datasets that are real namic? If yes, what percentage of metadata links to such data? Does the national portal provide a separate section whether the se ficial data (not stemming from official sources, such a ty-sourced/citizen-generated data) can be published? Do you have an overview of the data providers (official ficial) on your national portal? Does the national portal allow users to see what dat cannot be made available as open data? Portal sustainability Does the national portal have a strategy to ensure its su Does this strategy include a description of the portal's ence and measures to reach this audience? Is your national portal active on social media? Do you take actions to promote the national portal's a the available open data (e.g., regular info sessions and Are the portal's source code as well as relevant docume artifacts made available to the public (e.g., on platfor GitHub or GitLab)? Was there a user satisfaction survey concerning the na conducted in the past year? Is there a process by which the portal is reviewed an regularly? If yes, what is the frequency of these reviews? If yes, is the users' feedback considered in the review p Do you monitor via a dashboard the characteristics of the lished on the portal, such as the distribution across cate ic vs. real-time data and how these change over time? Does this monitoring enable the portal team and/or da to take action to improve their performance on the nation TOTAL Table 8 Open Data Maturity 2022 - Open Data Portal dimension score for Montenegro

language to tand it?	yes	10
ing the data-	yes	10
rated by API	see answer box	0
		30
bute data to	Few public sector data providers	0
olishing data	yes	10
ta providers	yes	10
regional and	no	0
lata sources	no	
sources har-		0
I-time or dy-	no	0
?		0
here non-of- is communi-	no	0
and non-of-	yes	10
a exists but	no	0
		75
istainability?	yes (URL didn't open)	0
target audi-	yes	10
	no	0
ctivities and /or events)?	yes	15
entation and ms such as	no	0
ational portal	yes	10
nd improved	yes	15
	annually	0
process?	yes	10
he data pub-	yes (URL	0
egories, stat-	didn't open)	
ita providers onal portal?	yes	15
		312

High-value datasets availability

Apart from dataset on macroeconomic data, it was not possible to identify specific high-value datasets with quality covered by the High-value Dataset Act, there are several potential datasets that could hold significant value, including the following:

Thematic area	Dataset	Link
Administration	List of municipalities in Montene-	https://data.gov.me/dataset/lista-op-
	gro	stina-crne-gore
Agriculture	Register of entities in organic pro-	https://data.gov.me/dataset/regis-
	duction	tar-subjekata-u-organskoj-proizvod-
		nji
Business-related data	Registry of Business Entities	available, but not as open data
Education	Statistics on education	https://data.gov.me/topic/obrazo-
		vanje?page=7
Energy	Register of energy permits	https://data.gov.me/dataset/regis-
		tar-energetskih-dozvola
Finance	Total amount of electronic fiscal-	https://data.gov.me/dataset/uk-
	ization turnover	upan-iznos-prometa-elektron-
		ske-fiskalizacije-1140
Finance	Company information	data exists, but not yet published as
		open data
Health	Air quality	available as open data, but not con-
		nected to the portal - <u>http://www.epa.</u>
		org.me/vazduh/
Health	Pollen concentrations in the air	data exists, but not yet published as
		open data
Health	Register of medicines for use in	https://data.gov.me/dataset/reg-
	human medicine	<u>istar-ljekova-za-upotrebu-u-hu-</u>
		<u>manoj-medicini</u>
Health	Report on established maximum	https://data.gov.me/dataset/iz-
	prices of medicines for use in hu-	vjestaj-o-utvrdenim-maksimalnim-ci-
	man medicine	jenama-ljekova-za-upotrebu-u-hu-
		<u>manoj-medicini</u>
Statistics	Other various statistics (macro-	https://data.gov.me/topic/statisti-
	economic data, poverty)	ka?page=3

Table 9 Potential high-value datasets in Montenegro

Recommendations

SHORT TERM RECOMMENDATIONS

Engage institutions to connect their already available data to the portal. Collaborate with data-holding institutions to ensure that their datasets are properly linked and integrated with the open data portal. This will enhance the comprehensiveness and accessibility of the portal's dataset collection.

Ask for assistance with the open data maturity questionnaire to provide accurate responses. Seek guidance or support from experts or organizations experienced in open data maturity assessments. This will ensure that the questionnaire is answered thoroughly and accurately, leading to a more comprehensive evaluation and understanding of the portal's maturity level.

LONG TERM RECOMMENDATIONS

Continue supporting and facilitating local and regional open data initiatives. Foster collaboration with local and regional authorities, organizations, and communities to encourage the publication and utilization of open data. This can help create a broader and more diverse ecosystem of open data initiatives throughout Montenegro.

Regularly exchange knowledge with re-users. Establish channels for ongoing communication and collaboration with data re-users, including researchers, developers, and entrepreneurs. This exchange of knowledge can lead to valuable insights, innovative applications, and increased usage of open data. Engage more institutions to publish data on the portal. Actively reach out to additional government departments, agencies, and public institutions to encourage them to share their datasets on the open data portal. Promote the benefits of open data and provide support and guidance to facilitate the publication process. Engage regional/local institutions to publish data or create their own portals and harvest them. Encourage regional and local institutions to embrace open data principles and either publish their data on the national open data portal or create their own portals. Establish mechanisms to harvest and integrate these regional and local datasets into the broader open data ecosystem. Develop an open data policy and action plan. Establish a comprehensive open data policy framework and action plan that outlines clear goals, strategies, and responsibilities for advancing open data initiatives in Montenegro. This policy and action plan can provide a roadmap for coordination, collaboration, and continuous improvement in open data activities.

North Macedonia

Portal availability

The open data portal of North Macedonia is readily accessible at https://data.gov.mk. This portal offers a comprehensive collection of open datasets, with a total of 607 datasets available from 74 different organizations. These datasets cover a wide range of topics and sectors, providing valuable information for various purposes.

In addition to the datasets, the portal also includes showcases that demonstrate practical use and application of open data. These showcases offer three examples of how open data can be utilized effectively to derive insights, inform decision-making, and drive innovation.



Figure 13 Open data portal of North Macedonia

Features and functionalities

In this section, we analyse the features and functionalities of the national open data portal in North Macedonia. It is important to note that North Macedonia did not participate in the 2022 open data maturity questionnaire. Therefore, based on the available input from North Macedonia, the results were estimated.

Regarding the open data portal dimension of the questionnaire, it is estimated that North Macedonia could achieve a score of 299 out of 650 points. While this score reflects the existing features and functionalities of the portal, it also indicates areas where further improvements can be made.

By enhancing the portal's capabilities and addressing the identified gaps, North Macedonia has the potential to increase its score and enhance the overall usability and effectiveness of the open data portal. This may involve improving data quality, expanding the range of available datasets, implementing user-friendly features, and ensuring compliance with open data standards.

Question	Answer	Points
Portal features		184
Is there a national portal in your country for making open data dis- coverable?	yes	20
Does the national portal offer an advanced data search function (multiple field search, filter options etc.)?	yes	10
Does the national portal offer the possibility for users to download datasets (e.g., via a link)?	yes	10
Does the national portal offer the possibility for users to search by file format?	yes	10
Does the national portal offer the possibility for users to search by data domain?	yes	10
Does the national portal offer to its users a way to programmatically query the metadata (e.g., via an API or a SPARQL access point)?	yes	10
Does the national portal offer documentation on the use of APIs and other tools that enable working with the aforementioned metadata?	1	0

Does the national portal enable users to provide contertal (e.g., to link documentation and supporting materia dataset)?

Does the national portal offer a general feedback mech ers (e.g., a "Contact us" or "Feedback" button that is visible spot on the portal and would allow users to se comment concerning the portal)?

Does the national portal offer a feedback mechanism a el? (e.g., a "feedback button" or a comment/ discussio der the dataset)?

Does the national portal provide a mechanism for users sets ?

Does the national portal enable users to find informati on relevant open data topics in the country?

Does the national portal offer the possibility for users to a cations when new datasets are available on the national ATOM feeds, email notifications etc)?

Does the national portal offer the possibility for users to sets?

If yes, what is the frequency of these requests?

Are these requests and their progress status presenter parent manner on the national portal?

Does the team monitor the extent to which requests (portal or otherwise) result in the publication of the reque If yes, to what degree do these requests result in the the requested data?

Does the national portal include a discussion forum or a change possibility for users (whether data providers or Does the national portal have a designated area to sl cases?

Does the national portal reference the datasets that the use cases are based on?

Does the national portal provide the possibility for use their own use cases?

Does the national portal offer a preview function for tab Does the national portal offer a preview function for geo Are you preparing to promote the publication of high-va on your national portal (e.g., by adding filtering features, changes to navigation)?

Portal usage

Is the national portal mobile as responsive as the deskt Do you monitor the portal's traffic (e.g., in terms of numbrisitors, visitor profiles, percentage of machine traffic downloads according to the number of datasets etc.)? Are traffic and usage statistics used to better understar haviour and needs and to update the portal accordingly Do you perform further activities to better understand haviour and needs (e.g., web analytics, surveys, or anal media feeds)?

What is the typical profile of the portal visitor, as learne ties such as web analytics, surveys, or social media an Does this profile match the type of audience your na wants to cater to?

How many unique visitors visit the national portal on month?

What percentage of the unique visitors to the national eign?

Do you monitor what keywords are used to search for o tent on the portal?

Do you monitor the most and least consulted pages?

nt for the por- als to a given	1	0
anism for us- s placed in a end a general	yes	10
t dataset lev- n section un-	yes	10
s to rate data-	no	0
on and news	1	0
receive notifi- l portal (RSS,	yes	10
request data-	yes	10
	less fre- quently than monthly	0
ed in a trans-	yes	10
either via the ested data?	yes	10
publication of	few datasets	4
any other ex- re-users)?	1	0
howcase [´] use	yes	10
e showcased	yes	10
ers to submit	yes	10
ular data?	yes	10
spatial data?	ves	10
alue datasets	/	0
ires, editorial	1	0
		30
top version?	Ves	10
ber of unique	,00 po	0
c, number of	no	0
nd users´ be- /?	/	0
d users´ be- lysis of social	1	0
d from activi- alvses?	a bit of every- thing	10
ational portal	/	0
average per	/	0
portal is for-	/	0
lata and con-	1	0
	1	0

What data categories are the top 5 most frequently consulted on the	/	0
portal, with 1 being the most popular one? What datasets are the top 5 most frequently consulted on the portal,	1	0
with 1 being the most popular one?		
Do you take measures to optimise the search and discoverability of	1	0
content (data and editorial)?		10
is the metadata on your portal available in clear plain language to	yes	10
Do you run analytics on API usage, if metadata describing the data-	no	0
sets is accessible via an API?		
If yes, what percentage of outgoing portal traffic is generated by API usage only?	1	0
Data provision		30
To what degree do public sector data providers contribute data to the	not all	0
Portal?	Voc	10
the national portal?	yes	10
Were there concrete actions taken to assist these data providers with	yes	10
their publication process?		
Besides the national open data portal, are there other regional and	/	0
Are regional and local portals listed above and their data sources	1	0
discoverable via the national portal?	/	0
If yes to what degree are existing regional and local sources har-	1	0
vested automatically?	,	U
Does the national portal include datasets that are real-time or dy-	yes	10
namic?		
If yes, what percentage of metadata links to such data?	1-10%	0
Does the national portal provide a separate section where non-of-	no	0
ficial data (not stemming from official sources, such as communi-		
ty-sourced/citizen-generated data) can be published?	1	0
bo you have an overview of the data providers (official and non-offi-	/	0
Does the national portal allow users to see what data exists but can-	1	0
not be made available as open data?	,	U
Portal sustainability		55
Does the national portal have a strategy to ensure its sustainability?	no	0
Does this strategy include a description of the portal's target audi-	no	0
ence and measures to reach this audience?		
Is your national portal active on social media?	yes	10
Do you take actions to promote the national portal's activities and	yes	15
the available open data (e.g., regular info sessions and/or events)?		-
Are the portal's source code as well as relevant documentation and	/	0
artifacts made available to the public (e.g., on platforms such as		
GITHUD OF GITLAD)?	no	0
conducted in the past year?	110	0
Is there a process by which the portal is reviewed and improved	1	0
regularly?		•
If yes, what is the frequency of these reviews?	1	0
If yes, is the users' feedback considered in the review process?	1	0
Do you monitor via a dashboard the characteristics of the data pub-	yes	15
lished on the portal, such as the distribution across categories, static		
vs. real-time data and how these change over time?		4 5
Does this monitoring enable the portal team and/or data providers to	yes	15
TOTAL		299
		200

Table 10 Open Data Maturity 2022 - estimated Open Data Portal dimension score for North Macedonia

High-value datasets availability

Although it was not possible to identify specific high-value datasets with quality covered by the High-value Dataset Act, there are several potential datasets that could hold significant value, including the following:

Thematic area	Dataset	Linl
Business-related	Register of Agricultural Prod-	http
data	uct Buyers	ap-h
	-	3bo
Business-related	The Trade Registry and the	ava
data	Registry of Other Legal Enti-	
	ties	
Education	Schools (multiple datasets)	<u>htt</u>
		set/
Finance	Budget (multiple datasets)	<u>http</u>
Finance	Public procurement (multiple	<u>htt</u>
	datasets)	set/
Geodata	List of cadastral municipalities	http
	in the Republic of North Mace-	<u>ckn</u> -
	donia	
Geodata	Cadastral municipalities with	<u>http</u>
	migrated digital cadastral	pck
	plans in the eCadastral sys-	<u>ckn</u>
	tem	mot
Geodata	Urban plans (multiple data-	htt
	sets)	set/
Health	Greenhouse gases (multiple	<u>htt</u>
	datasets)	set/
Health	Register of Medicines	<u>http</u>
		ap-h
Health	Inventory of Greenhouse Gas-	<u>http</u>
	es - Data by sectors	<u>hta</u>
11 14		tour
Health	Supply of water	http
Mata anala ma		<u>Jpvli</u>
Meteorology	vvater level (multiple datasets)	<u>ntt</u>
Mahility	Deviator of parking late and	Set/
MODIIILY	Register of parking lots and	nu
	parking spaces - Skopje	<u>nct</u>
		<u>la-c</u>
Statistics	Linemployed persons	<u>Knn</u> btt
Statistics	onemployed persons	<u>n tt</u>
Statistics	Average net salary per em-	http
Oldibiloo	plovee by industry sectors	ncn
	according to NACE Pey 2 by	cok
	months	COL
Statistics	Tourist arrivals and nights	http
	isanot arrivalo and highto	ha
		rodr
Statistics	Other miscellaneous statistics	httr
	(export import GDP macro-	mnh
	economic indicators)	

Table 11 Potential high-value datasets in North Macedonia

Recommendations SHORT TERM RECOMMENDATIONS

Update open data policy and/or strategy. Review and revise the existing open data policy and strategy to ensure its relevance and alignment with current needs and emerging trends. Incorporate best practices and international standards to enhance data accessibility, quality, and usability. **Prioritize high-value datasets** and promote publication. Identify and prioritize high-value datasets that have significant societal, economic, or research value. Engage relevant institutions and stakeholders to encourage the publication of these datasets on the open data portal, emphasizing their potential impact and benefits. **Organize open data-related events**. Plan and host open data-related events, such as conferences, workshops, or seminars, to raise awareness and promote the use of open data. These events can provide opportunities for knowledge sharing, collaboration, and networking among data providers, users, and enthusiasts. **Update portal** with minor features - implement analytics, consider user feedback. Enhance the functionality of the open data portal by incorporating minor features that improve user experience and data exploration.

nk
tps://data.gov.mk/mk/dataset/pernct-
-ha-otkynybahn-ha-3emjodejickn-npon-
bodn
allable but not as open data
ttps://data.gov.mk/mk/data-
et/?g=училишта
tps://data.gov.mk/mk/dataset/?q=Буџет
<u>ttps://data.gov.mk/mk/data-</u>
<u>et/?q=јавни+набавки</u>
tps://data.gov.mk/mk/dataset/katactap-
<u>In-onwinnn</u>
tps://data.gov.mk/mk/dataset/katacta-
kn-onwtnhn-hnn-dnrntajihn-katactap-
n-njiahobn-ce-mnrpnpahn-bo-cncte-
<u>ot-ekat</u>
<u>ttps://data.gov.mk/mk/data-</u>
et/?q=Урбанистички+планови
<u>ttps://data.gov.mk/mk/data-</u>
tps://data.gov.mk/mk/dataset/pernct-
ha-iiekobn
tps://data.gov.mk/mk/dataset/nhbe-
ap-ha-ctakjiehnhkn-racobn-noda-
un-no-cektopn
tps://data.gov.mk/mk/dataset/http-
vlisice-mk-lang-mk
$\frac{\text{ttps://data.gov.mk/mk/data-}}{\text{st/2a-POILOCTOL}}$
tps://data.gov.mk/mk/dataset/per-
ctap-ha-napknh3n-n-napknhr-mec-
-co-kon-ctonahncyba-itt-rpadckn-nap-
hr-ckonje
<u>ttps://data.gov.mk/mk/data-</u>
<u>et/?q=Невработени</u>
tps://data.gov.mk/mk/dataset/ttpocehho-
cnjiateha-heto-njiata-no-bpa6oteh-no-
ektopn-ha-dejhoct-no-hkd-peb-2-no-me-
eun ths://data.gov.mk/mk/dataset/doarabba
-tvpnctn_n_hokehahba_ba_tvpnctn_no_
dnhn-n-meceun
tps://data.gov.mk/mk/organization/
nhnctepctbo-3a-qpnhahcnn

Implement analytics tools to measure and monitor data usage, engagement, and impact. Consider user feedback to identify areas for improvement and prioritize user needs and preferences.

Publish source code of the portal. Foster transparency and collaboration by making the source code of the open data portal publicly available. By sharing the source code, developers and the wider community can contribute to the enhancement, customization, and security of the portal.

Ask for help with the open data questionnaire to answer properly. Seek assistance and guidance in completing the open data questionnaire to ensure accurate and comprehensive responses. Collaborate with experts or organizations experienced in open data assessments to provide insights, support, and recommendations for improvement.

LONG TERM RECOMMENDATIONS

Continue support and facilitate local and regional open data initiatives. Foster a supportive environment for local and regional open data initiatives by providing guidance, resources, and technical assistance. Collaborate with local governments, organizations, and communities to encourage the publication and utilization of open data at the grassroots level.

Continue to **regularly exchange knowledge** with re-users, Establish mechanisms for ongoing knowledge exchange and collaboration with re-users of open data. Organize regular meetings, workshops, or forums where data users can share their experiences, insights, and challenges. This will help improve the quality, relevance, and usability of the data published on the portal.

Develop how to measure analytics on the open data portal to define impact. Implement robust analytics tools and methodologies to measure and assess the impact of the open data portal. Track and analyse usage statistics, user feedback, data applications, and societal outcomes to gain insights into the effectiveness and value of the portal. This will enable evidence-based decision-making and further improvements in data publication and usage.

Engage more institutions to publish data on the portal. Actively reach out to relevant institutions, both at the national and local levels, and encourage them to publish their data on the open data portal. Highlight the benefits of open data publication, such as increased transparency, innovation, and data-driven decision-making. Provide technical support and guidance to facilitate the process of data publication.

Engage regional/local institutions to publish data or create their own portal to be harvested by the national portal. Collaborate with regional and local institutions to promote open data publication. Encourage these institutions to publish their data on the national portal or support them in creating their own open data portals. Establish mechanisms for data harvesting and integration, ensuring that regional and local data sources are accessible through the national portal, thereby enriching the overall dataset availability.

Serbia

Portal availability

The open data portal of Serbia, available at https://data.gov.me, is a comprehensive platform that provides access to a vast amount of data. With a collection of 2178 datasets sourced from 113 different organizations, the portal offers a wide range of information spanning various sectors. It serves as a valuable resource for researchers, analysts, and citizens interested in exploring and utilizing open data for innovative applications and decision-making processes.

The open data portal of Serbia not only provides access to a wide range of datasets but also offers many examples of their practical utilization. This feature allows users to explore real-life applications and use cases that demonstrate the value and potential of the available datasets. By showcasing these examples, the portal encourages users to leverage the datasets creatively, fostering innovation and promoting the development of new insights and solutions.



Figure 14 Open data portal of Serbia

Features and functionalities

This section focuses on evaluating the features and functionalities of the Serbian national open data portal, which were accessible during the completion of the open data maturity questionnaire. In the open data portal dimension of the questionnaire, Serbia achieved a score of 445 out of 650 points, indicating a substantial level of maturity. It is worth noting that additional points could be obtained by ensuring the long-term sustainability of the portal, as it is already recognized and referenced in the Law on Electronic Government.

Question

Portal features

Is there a national portal in your country for making ope erable?

Does the national portal offer an advanced data search tiple field search, filter options etc.)?

Does the national portal offer the possibility for user datasets (e.g., via a link)?

Does the national portal offer the possibility for users to format?

Does the national portal offer the possibility for users data domain?

Does the national portal offer to its users a way to pro query the metadata (e.g., via an API or a SPARQL acce Does the national portal offer documentation on the us other tools that enable working with the aforementioned

	Answer	Points
		170
en data discov-	yes	20
function (mul-	yes	10
s to download	yes	10
search by file	yes	10
s to search by	yes	10
ogrammatically ess point)?	yes	10
se of APIs and d metadata?	yes	10

Does the national portal enable users to provide content for the portal	yes	10
(e.g., to link documentation and supporting materials to a given data- set)?		
Does the national portal offer a general feedback mechanism for us-	yes	10
ers (e.g., a "Contact us" or "Feedback" button that is placed in a visible		
spot on the portal and would allow users to send a general comment		
concerning the portal)?		10
Does the national portal offer a feedback mechanism at dataset level?	yes	10
(e.g., a reedback button or a comment/ discussion section under the		
Does the national portal provide a mechanism for users to rate data-	no	0
sets ?	110	0
Does the national portal enable users to find information and news on	yes, but not	0
relevant open data topics in the country?	anymore	
Does the national portal offer the possibility for users to receive notifi-	no	0
cations when new datasets are available on the national portal (RSS,		
ATOM feeds, email notifications etc)?		
Does the national portal offer the possibility for users to request data-	no	0
sets?		0
Are those requests and their progress status presented in a transpar	no	0
Are mese requests and men progress status presented in a manspar- ent manner on the national portal?	110	0
Does the team monitor the extent to which requests (either via the	no	0
portal or otherwise) result in the publication of the requested data?	110	Ŭ
If yes, to what degree do these requests result in the publication of the		0
requested data?		
Does the national portal include a discussion forum or any other ex-	yes	10
change possibility for users (whether data providers or re-users)?		
Does the national portal have a designated area to showcase use	yes	10
Cases?	1/00	10
Does the national ponal reference the datasets that the showcased	yes	10
Does the national portal provide the possibility for users to submit	ves	10
their own use cases?	,	
Does the national portal offer a preview function for tabular data?	no	
Does the national portal offer a preview function for geospatial data?	no	
Are you preparing to promote the publication of high-value datasets	yes	20
on your national portal (e.g., by adding filtering features, editorial fea-	5	
tures, changes to navigation)?		
Portal usage		125
Is the national portal mobile as responsive as the desktop version?	yes	10
Do you monitor the portal's traffic (e.g., in terms of number of unique	yes	15
visitors, visitor profiles, percentage of machine traffic, number of		
downloads according to the number of datasets etc.)?		40
Are traffic and usage statistics used to better understand users be-	yes	10
Do you perform further activities to better understand users' behaviour	Ves	10
and needs (e.g. web analytics surveys or analysis of social media	yes	10
feeds)?		
What is the typical profile of the portal visitor, as learned from activities	a bit of ev-	10
such as web analytics, surveys, or social media analyses?	erything	
Does this profile match the type of audience your national portal wants	yes	10
to cater to?		10
How many unique visitors visit the national portal on average per	28022	10
Month?	5%	0
what percentage of the unique visitors to the national portal is for-	570	U
Do you monitor what keywords are used to search for data and con-	no	0
tent on the portal?		-
Do you monitor the most and least consulted pages?	yes	10
What data categories are the top 5 most frequently consulted on the	see answer	10
portal with 1 being the most popular one?	box	
pertai, mar i benig ale meet pepalar ener		

What datasets are the top 5 most frequently consulted with 1 being the most popular one? Do you take measures to optimise the search and dis content (data and editorial)? Is the metadata on your portal available in clear plain la able both humans and machines to read and understar Do you run analytics on API usage, if metadata descri sets is accessible via an API? If yes, what percentage of outgoing portal traffic is gen usage only? Data provision To what degree do public sector data providers contribu portal? Do you identify the data providers that are not yet publ the national portal? Were there concrete actions taken to assist these data their publication process? Besides the national open data portal, are there other local portals? Are regional and local portals listed above and their dat coverable via the national portal? If yes, to what degree are existing regional and local so ed automatically? Does the national portal include datasets that are real-ti ic? If yes, what percentage of metadata links to such data? Does the national portal provide a separate section whe data (not stemming from official sources, such as comm citizen-generated data) can be published? Do you have an overview of the data providers (officia cial) on your national portal? Does the national portal allow users to see what data e not be made available as open data? Portal sustainability Does the national portal have a strategy to ensure its su Does this strategy include a description of the portal's ta and measures to reach this audience? Is your national portal active on social media? Do you take actions to promote the national portal's act available open data (e.g., regular info sessions and/or Are the portal's source code as well as relevant docur artifacts made available to the public (e.g., on platfe GitHub or GitLab)? Was there a user satisfaction survey concerning the conducted in the past year? Is there a process by which the portal is reviewed and ularly? If yes, what is the frequency of these reviews? If yes, is the users' feedback considered in the review p Do you monitor via a dashboard the characteristics of lished on the portal, such as the distribution across cat vs. real-time data and how these change over time? Does this monitoring enable the portal team and/or dat take action to improve their performance on the national

TOTAL

Table 12 Open Data Maturity 2022 - Open Data Portal dimension score for Serbia

on the portal,	see answer box	10
coverability of	yes	10
anguage to en- nd it?	yes	10
bing the data-	no	0
nerated by API	l don't know	0
		70
ute data to the	half	8
ishing data on	yes	10
providers with	yes	10
r regional and	yes	0
ta sources dis-	yes	10
urces harvest-	majority	12
ime or dynam-	yes	10
?	1-10%	0
ere non-official unity-sourced/	no	0
I and non-offi-	yes	10
exists but can-	no	0
		80
ustainability?	no	0
arget audience	no	0
	no	0
tivities and the events)?	yes	15
mentation and orms such as	yes	10
national portal	no	0
improved reg-	yes	15
	annually	0
process?	yes	10
the data pub-	yes	15
tegories, static	-	
ta providers to al portal?	yes	15
		445

High-value datasets availability

Although it was not possible to identify specific high-value datasets with quality covered by the High-value Dataset Act, there are several potential datasets that could hold significant value, including the following:

Thematic area	Dataset	Link
Business-related	Registry of Business Entities	available, but not as open data
data	0,	•
Education	Statistics from the education	https://data.gov.rs/sr/organizations/
	sector (multiple datasets)	ministarstvo-prosvete-nauke-i-tekhno-
	, i ,	loshkog-razvoja/?datasets page=1#or-
		ganization-datasets
Finance	Local Budget (multiple datasets)	https://data.gov.rs/sr/data-
	3 (1 <i>)</i>	sets/?q=Буџет
Geodata	Cleanliness and greenery - city	https://data.gov.rs/sr/datasets/chistot-
	of Niš	sha-i-zelenilo/
Geodata	Green areas	https://data.gov.rs/sr/datasets/ze-
		lene-povrshine/
Geodata	Local communities	https://data.gov.rs/sr/datasets/
		mesne-zajednitse/; https://data.gov.rs/
		sr/datasets/mesne-zajednitse-prostor-
		ni-plan-pp/
Geodata	Spatial plan (multiple datasets)	https://data.gov.rs/sr/data-
		sets/?q=Просторни%20план
Health	Results of air monitoring in the	https://data.gov.rs/sr/data-
	city of Šabac (multiple datasets)	sets/?q=Резултати%20
	, , , , , , , , , , , , , , , , , , , ,	мониторинга%20ваздуха
Health	Pollen concentrations in the air	https://data.gov.rs/sr/datasets/kontsen-
	- API	tratsije-polena-u-vazdukhu-api/
Health	List of Medicines	https://data.gov.rs/sr/datasets/le-
		kovi-za-upotrebu-u-khumanoj-meditsi-
		ni/
Health	Medicine consumption - by year	https://data.gov.rs/sr/datasets/prom-
		et-i-potroshnja-lekova-po-godinama/
Meteorology	Illumination of space	https://data.gov.rs/sr/datasets/osvetl-
		jenost-prostora/
Mobility	Public transport timetable (multi-	<u>https://data.gov.rs/sr/data-</u>
	ple datasets)	<u>sets/?q=Ред%20вожње</u>
Mobility	Parking zones (multiple data-	<u>https://data.gov.rs/sr/data-</u>
	sets)	<u>sets/?q=Паркинг</u>
Mobility	Transport network - Municipality	https://data.gov.rs/sr/datasets/put-
	of Raška	<u>na-mrezha/</u>
Mobility	Road infrastructure of Serbia	https://data.gov.rs/sr/datasets/put-
	(geodata / nodes and edges	<u>na-infrastruktura-srbije-geoda-</u>
	(geojson))	<u>ta-nodes-and-edges-geojson/</u>
Mobility	Data on traffic accidents by po-	https://data.gov.rs/sr/datasets/po-
	lice administrations and munici-	datsi-o-saobratshajnim-nezgoda-
	palities	<u>ma-po-politsijskim-upravama-i-op-</u>
		<u>shtinama/</u>
Statistics	Other miscellaneous statistics	https://data.gov.rs/sr/organizations/
	(population, unemployment,	republichki-zavod-za-statistiku/?data-
	GDP - multiple datasets)	sets_page=1#organization-datasets

Table 13 Potential high-value datasets in Macedonia

Recommendations SHORT TERM RECOMMENDATIONS

Implement an RSS feed. Introduce the functionality to generate and publish RSS feeds for datasets, enabling users to subscribe and receive updates on new and updated datasets. This can enhance the accessibility and convenience of accessing data through the portal.
 Implement the possibility to request datasets. Enable users to submit requests for specific datasets that are not currently available on the portal. This feature can help prioritize the release of valuable datasets based on user demand and foster engagement with data re-users.
 Improve metadata quality. Pay attention to metadata completeness, accuracy, and consistency across all datasets. Clear and comprehensive metadata ensures that users can easily understand and assess the content and relevance of the available datasets.

Prioritize high-value datasets and promote publication. Identify and prioritize high-value datasets that have significant societal, economic, or research value. Engage relevant institutions and stakeholders to encourage the publication of these datasets on the open data portal, emphasizing their potential impact and benefits.
Create a document describing the portal and its intended audience. Develop a document that outlines the purpose, features, and target audience of the open data portal. This document will help ensure the long-term sustainability of the portal by providing clarity and guidance for its management and usage.
Publish source code of the portal. Foster transparency and collaboration by making the source code of the open data portal. By sharing the source code, developers and the wider community can contribute to the enhancement, customization, and security of the portal.
Seek assistance with the open data maturity questionnaire. Collaborate with experts or organizations experienced in open data maturity assessments to properly answer the questionnaire. Their guidance and expertise can help provide accurate and comprehensive responses, leading to a more reliable evaluation of the portal's maturity.

LONG TERM RECOMMENDATIONS

Ensure full DCAT-AP compatibility. Align the open data portal with the DCAT-AP (Data Catalogue Application Profile) standard to ensure interoperability and seamless data integration with other platforms and systems. This will enable efficient sharing and exchange of data on a broader scale. **Continue to support and facilitate** local and regional open data initiatives. Collaborate with local governments, organizations, and communities to encourage the publication of open data at the local and regional levels. This can foster a culture of data sharing and engagement across various geographical areas. **Regularly exchange knowledge** with re-users. Establish channels for ongoing communication and collaboration with data re-users. By actively seeking feedback, sharing best practices, and understanding user needs, the open data portal can continuously improve its offerings and enhance the value of the available datasets.

Engage more institutions to publish data on the portal. Actively reach out to governmental bodies, public institutions, and other relevant organizations to encourage and facilitate the publication of their data on the open data portal. This will broaden the range of available datasets and increase the usefulness of the portal for data consumers.

Separate open data policy and action plan. Develop a **dedicated open data policy and action plan** that clearly outlines the strategic objectives, goals, and measures to promote open data initiatives. This will provide a framework for coordinated efforts, ensure accountability, and support the long-term sustainability and growth of the open data ecosystem in Serbia.

3.3 Summary of findings

Based on the findings of the Open Data Maturity 2022 report, it is evident that ReSPA Members administrations, obtained scores below the average of the European Union.

	Albania	Bosnia and Herzegovina	Montenegro	North Macedonia*	Serbia
Dimension 1: Open Data	352	200	375	415	475
Policy					
1.1 Policy framework	195	130	165	130	180
1.2 Governance of open data	95	25	105	190	160
1.3 Open data implemen- tation	62	45	105	95	135
Dimension 2: Open Data	70	40	200	185	385
Impact					
2.1. Strategic awareness	30	40	40	80	150
2.2 Measuring re-use	40	0	80	40	90
2.3 Created impact	0	0	80	65	145
2.3a Governmental impact	0	0	15	15	45
2.3b Social impact	0	0	0	15	15
2.3c Environmental impact	0	0	45	35	45
2.3d Economic impact	0	0	20	0	40
Dimension 3: Open Data	303	185	312	299	445
Portal					
3.1 Portal features	100	70	62	184	170
3.2 Portal usage	105	45	145	30	125
3.3 Data provision	48	45	30	30	70
3.4 Portal sustainability	50	25	75	55	80
Dimension 4: Open Data	135	30	355	360	364
Quality					
4.1 Currency and com-	85	20	30	95	80
pleteness	50	10	75	70	105
4.2 Monitoring and mea-	50	10	75	10	105
4.3 DCAT-AP Compliance	0	0	110	80	79
4.4 Deployment quality	0	0	140	115	100
and linked data					
TOTAL	860	455	1242	1259	1669
PERCENTAGE	34%	18%	49%	50%	66%
EU AVERAGE - 79%					
* - estimated					

Table 14 Open Data Maturity 2022 WB score (values for North Macedonia are estimated)

Albania, Bosnia and Herzegovina, and Montenegro were classified within the beginners' group, indicating that they are in the early stages of developing their open data initiatives. Based on estimated results, it is likely that North Macedonia would also fall into this beginners' group.

On the other hand, Serbia is placed in the followers' group, indicating a slightly higher level of progress compared to the beginners. This signifies that Serbia has made some strides in its open data efforts, but there is still room for improvement and further advancement.

Overall, the Western Balkan administrations face common challenges in enhancing their open data maturity levels. However, it is important to acknowledge their commitment and ongoing efforts in promoting transparency, data openness, and fostering an enabling environment for open data initiatives in the region. Continued collaboration, knowledge sharing, and targeted support can contribute to the advancement of open data practices in these administrations, ultimately leading to improved transparency, accountability, and socio-economic development.

In terms of **features and functionalities**, there are several common aspects observed in the open data portals of ReSPA Members administrations. These include:

- Advanced Data Search Function The portals across the WB administrations have implemented an advanced search function that allows users to conduct searches using multiple fields and filter options. This enhances the efficiency and effectiveness of finding specific datasets.
- Downloading Datasets Users are provided with the option to download datasets directly from the portals, typically through a downloadable link. This enables users to access and utilize the data for their own purposes.
- User-Provided Content The portals allow users to contribute content by linking documentation and supporting materials to specific datasets. This collaborative approach encourages the exchange of information and enriches the overall user experience.
- General Feedback Mechanism To foster user engagement and improve the quality of the portal, a general feedback mechanism is available, enabling users to provide their suggestions, comments, and feedback. Mobile Responsiveness - The national portals have been designed to be mobile responsive, ensuring that users can access and navigate the portals seamlessly on both desktop and mobile devices.

SPA Members administrations' portals include:

- Lack of Notification System The portals do not offer the functionality for users to receive notifications when new datasets become available. This absence of RSS, ATOM feeds, or email notifications hinders timely awareness of newly published datasets.
- Transparency of Requests and Progress There is no transparent presentation of user requests and their progress status on the national portals. This limits visibility into the status and outcomes of user requests. Promotion of High-Value Datasets - The national portals do not actively promote the publication of high-value datasets by incorporating filtering features, editorial features, or navigation changes that would enhance
- the visibility and accessibility of such datasets.
- Non-Official Data Section The portals lack a dedicated section where non-official data, such as community-sourced or citizen-generated data, can be published. This restricts the inclusion of valuable data from non-official sources.
- Unavailable Data Visibility The national portals do not provide information about datasets that exist but cannot be made available as open data. This lack of visibility limits users' understanding of the complete data landscape.

From the analysis of **potential high-value datasets**, it is evident that identifying such datasets opened in each ReSPA Members administration is a challenging task. However, certain datasets can be found in at least two administrations, indicating commonalities in data availability. These datasets include:

- Other Miscellaneous Statistics: Various statistics related to factors such as unemployment, GDP, and other socio-economic indicators are available in multiple administrations.
- Traffic Accident Data: Data pertaining to traffic accidents is accessible in multiple administrations, allowing for comparative analysis and insights into road safety.
- Air Pollution: Datasets concerning air pollution, including measurements and monitoring data, are found in multiple administrations.
- Registry of Business Entities: Information related to the registry of business entities is available across several administrations, aiding in business-related analyses and research. Unfortunately, this data is not yet available as open data, but it is important to note that the data exists.
- Budget on National and/or Regional Level: Data on national and regional budgets are accessible in multiple administrations, offering transparency and insights into public finances.
- List of Medicines: Registers containing information on medicines and pharmaceutical products are available in various administrations, supporting healthcare research and analysis.
- List of Schools and Various Educational Statistics: Datasets related to schools, educational institutions, and various educational statistics can be found in multiple administrations.
- List of Municipalities: Information on municipalities, including administrative details, is available in several administrations.

Furthermore, certain common thematic areas have been identified where data exists across the ReSPA Members administrations. These areas include health, finance (budget), environment (air quality, water, weather), and statistics. To leverage the potential of open data in addressing specific challenges within these thematic areas, it is recommended that an open data challenge can be organized, encouraging participation from WB administrations. This challenge would focus on utilizing open data to solve a particular problem within one of the identified thematic areas, fostering collaboration, innovation, and the utilization of open data resources. By addressing the challenges of identifying high-value datasets and encouraging collaboration through focused initiatives, the WB administrations can further enhance their open data ecosystems, promote data-driven decision-making, and unlock the full potential of open data for societal and economic benefits.

However, there are certain areas where improvements can be made. Some common limitations observed in Re-

CONCLUSION

Pablic administrations in ReSPA Members stands at a pivotal juncture with respect to the management and dissemination of open data. This proposal underscores a transformative shift from a traditional supply-centric approach to a demand-driven, 'bottom-up' methodology.

At the heart of this paradigm shift is the identification of pressing problem areas. These are mapped out using a meticulously designed template that captures key parameters: the nature of the problem, the core team responsible for its resolution, the primary questions driving data collection, the envisioned outcomes, and the potential utility of open data within the respective problem domain.

To ensure these problem areas are consistently and systematically addressed, two distinct strategies have been proposed. The first envisages the deployment of expert groups who will spearhead the identification and resolution processes. The second strategy adopts a more democratic approach, advocating for crowdsourced innovation where users of national portals can suggest problem areas and evaluate peer recommendations.

Central to this new framework is the proactive engagement of stakeholders. The academic community is encouraged to move beyond theoretical constructs and apply their knowledge to practical, tangible solutions. The private sector, diverse in its roles, is called upon not merely as a benefactor but as an active participant—sponsoring hackathons, sharing datasets, and tapping into emerging business opportunities in the data landscape.

A roadmap for solution development is delineated in clear, actionable steps. This includes the identification of key impact indicators, engagement of stakeholders, and the selection of effective methodologies. Promoting and disseminating these solutions is also emphasized, ensuring that the benefits reach the target audience. The proposal accentuates the necessity of rigorous impact assessments. Developed solutions should be benchmarked against desired outcomes, striving to not just meet but surpass set standards. For particularly successful solutions, there's a focus on documenting and sharing these triumphs, thereby enriching the global open data community.

Accompanying this proposal are several recommendations, highlighting the need for political will, capacity building within public administrations, thorough situational analyses, and consistent implementation strategies. A standout suggestion is the incorporation of gamification, recognizing its potential to boost public participation and stakeholder interest.

The Expected Dataset Impact Index elucidates projected outcomes across various sectors, with particular emphasis on the economic dimension. These benefits range from job creation and income generation to fostering innovation and holistic economic growth.

In conclusion, this proposal presents a structured and actionable blueprint for revolutionizing open data management among ReSPA Members public administrations. By adopting its demand-centric approach, the aim is to ensure that open data is not only available but is also pertinent, influential, and transformative for all stakeholders.

The journey towards open data excellence for ReSPA Members public administrations underscores the importance of clear licensing frameworks and adept data management practices. Open data licensing plays a vital role, ensuring transparency, innovation, and unrestricted data reuse. While these administrations are at varied stages in their open data initiatives, they share the unified goal of enhancing data accessibility and quality.

Creative Commons licenses provide a valuable tool for open data licensing. Licenses like CC-BY and CC0 simplify data sharing, promoting collaboration and knowledge dissemination. For instance, Montenegro recommends the use of the CC-BY license, while Serbia employs the Open License 2.0 (developed by French administration) on its open data portal.

The possibility of developing national licenses allows Western Balkans public administrations to tailor licensing frameworks. Aligning these with recognized Creative Commons licenses, such as CC-BY or CCO, ensures interoperability and facilitates data sharing. European administrations offer a wealth of insights for the Western Balkans. Many have successfully adopted licensing models, from the use of CC-BY or CCO licenses to the creation of national licenses in line with international norms.

Through this journey, Western Balkans public administrations are addressing shared challenges and elevating their open data proficiency. The endeavours of Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia in championing transparency, accountability, and socio-economic growth via open data initiatives deserve commendation. Collaboration, knowledge transfer, and targeted support are integral to advancing open data practices in the region.

A review of open data portals in the Western Balkans reveals both common trends and areas ripe for improvement. Advanced data search capabilities and mobile responsiveness are laudable features. However, there's a need to address challenges such as the absence of notification systems, transparent progress tracking, and promoting high-value datasets to enhance user experiences. Collaboration with experts or organizations skilled in open data maturity assessments is vital for proper questionnaire responses. Some administrations also require assistance with DCAT-AP compliance. A document outlining standard functionalities in open data portals can serve as a guide for Western Balkans public administrations looking to enrich their data platforms. By adopting effective licensing practices and drawing lessons from European peers, ReSPA Members public administrations can unlock the vast potential of open data. This not only promotes data-driven decision-making but also lays the foundation for innovation, transparency, and sustainable socio-economic growth.

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Annex 1: Survey questionnaires

The survey is not anonymous. The content of the question is subject to changes that can be made by a team of responsible persons if these changes prevent the underestimation or overestimation of the impact of the open data set. The questions are in the format "to what extent you consider" and are based on a reasoned assessment by the respondent. The maximum number of points for each questionnaire is 100. Role of the team of responsible persons in the survey

- Decides on the tool to be used in the final preparation of the survey questionnaire. It is recommended to use the EUSurvey³⁸ application or Survey solutions, a free survey tool developed by the World Bank (World Bank Group), as it is considered the best survey tool for national statistical institutes and for public and private research organizations' worldwide.
- Adjusts the content and scoring scale of the survey and the size of the weighting of influence categories in the selected problem area. For the impact of the open data set to be properly assessed (ex-ante) or measured (ex-post), the content of the survey questionnaire should be adapted to the potential of the open data set to address key issues of the problem area or to achieve the desired effects. Therefore, after the first three steps described in Chapter Survey process model have been carried out and before joining the final fourth step, a team of responsible persons approaches the preparation of the questionnaire by adapting generic questions, adding new questions, and adjusting the scorecard (if necessary) according to the conclusions of the first three steps. It is recommended that the total number of index points remains unchanged so that the resulting indices of different datasets can be compared both point and percentage, which is particularly important for the academic community that could use these indices in its own research. In agreement with the core team, the team of responsible persons shall decide on the size of the weights for each impact category in accordance with the defined potential impact of the data set.
- Decides on the format of the questionnaire. The team of responsible persons selects the format of the survey. In doing so, it is important to emphasize that it is necessary for each question to be offered the possibility of:
 - I. selecting the level of confidence in the response given (0%, 25%, 50%, 75%, 95% or **100%).** so that in case of unsubstantiated and inaccurate responses, the team of respondents has additional coverage in correcting the response and awarding points; and
 - II. the reasons for and evidence of the response given. It is extremely important that each given answer has its own cover, the accuracy of which will be subsequently verified by the team of responsible persons and corrected if the justification is unfounded/incorrect in order to award a correct/objective number of points for a given question.
- Reviews responses in received survey questionnaires and assigns points. The team of responsible persons has the task of verifying the validity of each response in the questionnaire. In order to avoid the impact of bias in the questionnaire responses, the team of responsible persons shall be given an additional opportunity to:
 - I. award a higher/lower number of points than the number of points provided for the response provided if and only if the justification/proof provided is incorrect or lacking, and the team of persons responsible is duly covered. Such deviations shall be notified to the core team by the team of responsible persons.

In this task, the team of responsible persons uses the guide to compile the impact index, which has the following (o) for each question:

- the space for awarding points;
- the question "is the number of points awarded in accordance with the respondent's reply?" and THE yes or NO answer offered;
- space for the argument of the number of points awarded; the argument of the number of points is necessary if and only if the number of points awarded is inconsistent with the respondent's reply.
- Calculates the usage index in case of *ex-post* evaluation of the impact of the data set.
- Calculates the index of expected (ex-ante) or achieved (ex-post) impact of the set of open data based on assigned ratings in the guide for the development of the impact index (Appendix B).
- Report to the core team and other process stakeholders on the expected (ex-ante) or achieved (ex-post) impact of the open data set. The team of responsible persons shall decide on the method and format of reporting itself and shall encourage further action if necessary.

Expected economic impact Macroeconomic impact

- jobs?
 - □ no impact
 - u weak impact (dataset has job creation potential in only one enterprise/institution)

 - institutions) and/or in more than five institutions)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100% 2. To what extent do you think the opening of the observed dataset could trigger a reduction in operating costs?

- □ no impact
- institution)
- prises/institutions)
- panies/institutions)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100%

- tivity?
 - no impact
 - institution)
 - two to five institutions)
 - prises/institutions)

Explain your answer as accurately as possible.

1. To what extent do you think the creation of the observed dataset could stimulate the creation of new

medium impact (the dataset has the potential to create new jobs in one sector or in two to five

strong impact (the dataset has the potential to create new jobs in at least two different sectors

use weak impact (the dataset has the potential to reduce operating costs in only one enterprise/ medium impact (the dataset has the potential to reduce operational costs in two to five enter-□ strong impact (the dataset has the potential to reduce operating costs in more than five com-

3. To what extent do you think the opening of the observed dataset could trigger an increase in produc-

weak impact (the dataset has the potential to increase productivity in only one enterprise/ medium impact (the dataset has the potential to increase productivity in two to five enterprises/ □ strong impact (the dataset has the potential to increase productivity in more than five enter-

Confidence level: "0%," 25%," 50%," 75%," 95%," 100% Microeconomic and sectoral impact

- 4. To what extent do you think the opening of the observed dataset could stimulate business growth and/ or development?
 - □ no impact
 - weak impact (the dataset has the potential to stimulate growth and/or development of only one enterprise/institution)
 - medium impact (the dataset has the potential to stimulate growth and/or development of two to five enterprises/two to five institutions)
 - □ strong impact (the dataset has the potential to stimulate growth and/or development of more than five enterprises/institutions)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100%

5. To what extent do you think the opening of the observed dataset could encourage the improvement of existing products and/or services?

□ no impact

weak impact (the dataset has the potential to improve only one existing product and/or service in one enterprise and/or institution)

- medium impact (the dataset has the potential to improve two to five existing products and/or services in one or more enterprises and/or institutions)
- □ strong impact (the dataset has the potential to improve more than five existing products and/ or services in one or more enterprises and/or institutions)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100%

- 6. To what extent do you think the opening of the observed dataset could encourage the development of new products and/or services?
 - ino impact
 - weak impact (the dataset has the potential to encourage the development of only one product and/or service in one enterprise and/or institution)
 - medium impact (the dataset has the potential to stimulate the development of two to five products and/or services in one or more enterprises and/or institutions)
 - □ strong impact (the dataset has the potential to encourage the development of more than five products and/or services in one or more companies and/or institutions)

Explain your answer as accurately as possible.

_	
7.	Confidence level: 0%, 25%, 50%, 75%, 95% To what extent do you think the opening and u cash savings from open access to information? no impact weak impact (the dataset has the poten mation in only one enterprise and/or inst medium impact (the dataset has the poten formation in two to five companies and/o strong impact (the dataset has the poten mation in more than five companies and/o
	Explain your answer as accurately as possible.
	Please specify all sources that support your res
_	
3.	Confidence level: 0%, 25%, 50%, 75%, 95% To what extent do you think the opening of the development of a particular economic sector? no impact weak impact (dataset has the potential enterprise/institution in the sector) medium impact (the dataset has the pot to five enterprises/institutions in the sect strong impact (the dataset has the pote than five enterprises/institutions in one of <i>Explain your answer as accurately as possible.</i>
_	
	Please specify all sources that support your res
_	
Im	Confidence level:" 0%," 25%," 50%," 75%," 95% pact on the public sector
9.	To what extent do you think the opening of the or and innovative public services?
	Explain your answer as accurately as possible.

6.^{°°} 100% use of the observed dataset could trigger time and/or

- itial to save time and/or money spent to access infortitution)
- tential to save time and/or money spent to access inor institutions)
- ntial to save time and/or money spent to access inford/or institutions)

sponse

6.^{°°} 100%

observed dataset could stimulate the growth and/or

to stimulate growth and/or development of only one

tential to stimulate growth and/or development of two tor)

ential to stimulate growth and/or development of more or more sectors)

sponse.

%,^{°°} 100%

observed dataset could encourage the creation of new

to create one new public service) tential to create two to five new public services) ntial to create more than five new public services)

Confidence level: "0%," 25%," 50%," 75%," 95%," 100% Expected Social impact

Housing

- 10. To what extent do you think the opening of the observed dataset could promote awareness of housing in a given area?
 - no impact
 - weak impact (the dataset has the potential to provide information for only one urban/rural area)
 - medium impact (the dataset has the potential to provide information for two to five urban/rural areas)
 - strong impact (the dataset has the potential to provide information for more than five urban/ rural areas)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100% Inclusion of marginalized social groups

- 11. To what extent do you think the opening of the data set under consideration could contribute to the inclusion of marginalized social groups in social and/or cultural and/or economic and/or political life?
 - □ no impact weak impact (the dataset has the potential to involve at least one marginalized social group from only one geographical area)
 - medium impact (the dataset has the potential to involve at least one marginalized social group with two to five geographical areas)
 - strong impact (the dataset has the potential to involve two or more marginalized social groups with more than five geographical areas)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100% **Reducing inequalities**

- 12. To what extent do you think the opening of the observed dataset could contribute to fostering awareness of social equality?
 - □ no impact
 - u weak impact (the dataset has the potential to inform at least one social group about social equality)
 - medium impact (the dataset has the potential to inform two to five social groups about social equality)
 - strong impact (the dataset has the potential to inform more than five social groups about social equality)

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100%

13. To what extent do you think the opening of the data set under consideration could contribute to fostering a balance between private and professional life? □ no impact

- state of work-life balance) cate better working time conditions)
- one action measure)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100% Expected governmental impact Transparency and accountability

14. To what extent do you think the opening of the observed dataset could give an insight into public spending?

- no impact
- one local/regional unit and/or government and/or public institutions)
- tions)
- and/or public institutions)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100%

weak impact (the dataset has the potential to inform at least one social group about the current

medium impact (the dataset has the potential to encourage at least one social group to advo-

□ strong impact (the dataset has the potential to encourage the government to adopt at least

weak impact (the dataset has the potential to inform about the total public spending of only

medium impact (the dataset has the potential to inform in detail and transparently about public spending items of one or more local/regional units and/or governments and/or public institu-

strong impact (the dataset has the potential to provide up-to-date, detailed, and transparent information on public spending items of one or more local/regional units and/or governments

- 15. To what extent do you think the opening of the observed dataset could give an insight into the behaviour of political parties and politicians?
 - □ no impact
 - weak impact (the dataset has the potential to inform about the amount of the cost for the salaries of MPs and/or the budget of a political party)
 - medium impact (the dataset has the potential to inform about parliamentary activity and wages of MPs and/or budgets of two to five political parties)
 - □ strong influence (the dataset has the potential to inform Parliament's activities and salaries and/or the budget of all political parties in an up-to-date, detailed, and transparent manner)

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100%

16. To what extent do you think the opening of the observed dataset could give an insight into electoral processes and/or electoral results?

- □ no impact
- weak influence (dataset gives insight into final election results of last parliamentary and presidential elections)
- medium impact (data set gives insight into final electoral results of all parliamentary and presidential elections)
- strong influence (data set gives insight into final electoral results of all existing elections and referenda with the possibility of insight into the results of each polling station)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100% Efficacy

- 17. To what extent do you consider that the opening of the data set under consideration could have an impact on increasing government/public effectiveness in the provision of public services?
 - □ no impact
 - weak impact (the dataset has the potential to improve government/public effectiveness in only one public service segment)
 - medium impact (the dataset has the potential to speed up the public service process)
 - □ strong impact (dataset has potential for use in the provision of multiple different public services)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

- communication between citizens and the government/public sector? □ no impact

 - government/public sector competence)
 - government/public sector jurisdictions)
 - five government/public sector jurisdictions)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100%

19. To what extent do you think the opening of the observed dataset could have an impact on increasing the effectiveness of the public administration?

- □ no impact
- services)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100% Efficiency

- increase of government/public efficiency through the reduction of operating costs? □ no impact

 - es the need for at least one job)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100% **Decision-making**

18. To what extent do you think the opening of the observed dataset could have an impact on improving

use weak impact (the dataset has the potential to offer citizens information usable in one area of

medium impact (the dataset has the potential to offer citizens information usable in two to five

□ strong impact (the dataset has the potential to offer citizens information usable in more than

weak impact (dataset has the potential to accelerate one public administration service) medium impact (dataset has the potential to accelerate two or more public administration

□ strong impact (dataset has the potential to automate at least one public administration service)

20. To what extent do you consider that the opening of the observed dataset could have an impact on the

weak impact (dataset has the potential of occasional use in one public institution) medium impact (dataset has the potential of daily use in two or more public institutions) strong impact (the dataset has the potential to automate at least one public service and reduc-

- 21. To what extent do you think the opening of the observed dataset could contribute to evidence/data guided by (public) policymaking?
 - □ no impact
 - weak impact (dataset has the potential to justify at least one previously adopted (public) policy)
 - medium impact (the dataset has the potential to encourage the development of at least one new (public) policy)
 - □ strong impact (the dataset has the potential to become a relevant situational indicator and foster changes in an area relevant to at least one (public) policy)

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100%

22. To what extent do you think the opening of the observed dataset could encourage the development of awareness of a particular topic and accountability and action?

□ no impact

- weak impact (the dataset has the potential to inform on a particular topic of public interest)
- medium impact (the dataset has the potential to incentivize the responsibility of main actors on topics of public interest)
- □ strong impact (the dataset has the potential to encourage at least one social group to act in order to improve a particular situation of public interest)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100% Expected environmental impact

Water and/or air quality

- 23. To what extent do you think the opening of the observed dataset could encourage awareness of water and/or air quality and appropriate behavioural adjustment?
 - □ no impact
 - use weak impact (the dataset has the potential to provide information on water and/or air quality in only one area of the country)
 - medium impact (the dataset has the potential to provide information on water and/or air quality in two or more areas of the country)
 - □ strong impact (the dataset has the potential of up-to-date information on water and/or air guality throughout the national territory and of use in the preparation of emergency notices for behavioural adjustment)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Waste management

- awareness of waste management and appropriate behavioural adjustment?
 - □ no impact
 - collection schedule in this area)
 - waste collected per area and the waste collection schedule in these areas)
 - on responsible waste management)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100% Environmentally friendly transport

25. To what extent do you think the opening of the data set under consideration could encourage awareness-raising of the different sustainable transport options and appropriate behavioural adjustment?

- □ no impact
- in only one city/area)
- ronmentally friendly transport in two to five cities/areas)
- environmentally friendly transport in a given city/area)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100% Noise level

26. To what extent do you think the opening of the observed dataset could encourage awareness of the noise level in a given area and appropriate behavioural adjustment?

- □ no impact
- by only one type of facility (cars/airplanes/public transport) in only one city/area)
- facilities (cars/airplanes/public transport) in two to five cities/areas)

24. To what extent do you think the opening of the observed dataset could inform and develop users'

weak impact (the dataset has the potential to inform on the state of waste management in only one area of the country including the total monthly amount of waste collected and the waste

medium impact (the dataset has the potential to provide information on the state of waste management in only two or more areas of the country including the total monthly amount of

□ strong impact (the dataset has the potential to inform on the state of waste management throughout the national territory and can be used in the development of educational materials

-		
	nse	

weak impact (dataset has information potential on environmentally friendly transport options

medium impact (the dataset has the potential to inform about options and timetables for envi-

strong impact (the dataset has real-time information potential on environmentally friendly transport options and schedules in more than five cities/areas, provides insight into the amount of exhaust gases in a given city/area and provides the possibility to recommend the choice of

□ low impact (the dataset has the potential to provide information on the level of noise produced

medium impact (dataset has information potential on noise level produced by two types of

□ strong impact (the dataset has the potential to inform the level of noise produced by three or more types of objects (cars/airplanes/public transport) in three or more cities/areas)

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100%

Ex-post Survey questionnaire

Economic impact

Macroeconomic impact

- 1. To what extent do you think the creation of the observed dataset has stimulated the creation of new jobs?
 - □ no impact
 - weak impact (use of the open data set has stimulated job creation in only one enterprise/ institution)
 - medium impact (use of the open data set has stimulated job creation in one sector or in two to five institutions)
 - strong impact (the use of the open data set has stimulated job creation in at least two different sectors and/or in more than five institutions)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level:" 0%," 25%," 50%," 75%," 95%," 100%

- 2. To what extent do you consider that the opening of the observed dataset has led to a reduction in operating costs?
 - □ no impact
 - weak impact (use of the open data set resulted in reduced operating costs in only one enterprise/institution)
 - □ medium impact (use of the open data set resulted in reduced operating costs in two to five enterprises/institutions)
 - □ strong impact (use of the open data set resulted in lower operating costs in more than five companies/institutions)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100%

- tivity?
 - no impact
 - institution)
 - es/two to five institutions)
 - panies/institutions)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100% Microeconomic and sectoral impact

- development?
 - □ no impact
 - one enterprise/institution)
 - two to five enterprises/two to five institutions)
 - of more than five enterprises/institutions)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100%

- of existing products and/or services?
 - □ no impact
 - or service in one enterprise and/or institution)
 - ucts and/or services in one or more enterprises and/or institutions)
 - existing products and/or services in one or more companies and/or institutions)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100%

3. To what extent do you think the opening of the observed dataset has triggered an increase in produc-

use weak impact (use of the open data set resulted in productivity gains in only one enterprise/ medium impact (use of the open data set resulted in productivity gains in two to five enterpris-□ strong impact (use of the open data set resulted in productivity gains in more than five com-

4. To what extent do you think the opening of the observed dataset has stimulated business growth and

use weak impact (use of the open data set resulted in fostering growth and/or development of only

□ medium impact (use of the open data set resulted in fostering growth and/or development of strong impact (use of the open data set has resulted in fostering growth and/or development

5. To what extent do you consider that the opening of the observed dataset has led to the improvement

□ low impact (use of the open data set resulted in improvement of only one existing product and/

medium impact (use of the open data set resulted in improvement of two to five existing prod-

□ strong impact (the use of an open data set has resulted in the improvement of more than five

- 6. To what extent do you think the opening of the observed dataset has stimulated the development of new products and/or services?
 - no impact
 - □ low impact (use of the open data set resulted in fostering the development of only one product and/or service in one enterprise and/or institution)
 - medium impact (use of the open data set has resulted in fostering the development of two to five products and/or services in one or more enterprises and/or institutions)
 - □ strong impact (the use of an open data set has resulted in fostering the development of more than five products and/or services in one or more companies and/or institutions)

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100%

7. To what extent do you consider that the opening and use of the observed dataset has triggered time and/or cash savings from open access to information?

- □ no impact
- □ low impact (use of the open data set resulted in saving time and/or money spent to access information in only one enterprise and/or institution)
- medium impact (use of the open data set resulted in saving time and/or money spent to access information in two to five companies and/or institutions)
- □ strong impact (use of the open data set has resulted in saving time and/or money spent to access information in more than five companies and/or institutions)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100%

8. To what extent do you think the opening of the observed dataset has stimulated the growth and development of a particular economic sector?

- □ no impact
- use weak impact (use of the open data set resulted in fostering growth and/or development of only one enterprise/institution in the sector)
- □ medium impact (use of the open data set resulted in fostering growth and/or development of two to five companies/institutions in the sector)
- □ strong impact (use of the open data set has resulted in fostering growth and/or development of more than five enterprises/institutions in one or more sectors)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Impact on the public sector

- and innovative public services?
 - □ no impact
 - vice)
 - public services)
 - services and at least one of them has been completed)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100% Social impact

Housing

10. To what extent do you think the opening of the observed dataset has stimulated awareness of housing in a given area?

- no impact
- rural area)
- urban/rural areas)
- □ strong impact (use of the open data set resulted in the provision of information for more than five urban/rural areas)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100%

Inclusion of marginalized social groups

11. To what extent do you consider that the opening of the observed dataset contributed to the inclusion of marginalized social groups in social and/or cultural and/or economic and/or political life?

- □ no impact
- social group from only one geographical area)
- ized social group with two to five geographical areas)
- ized social groups with more than five geographical areas)

Explain your answer as accurately as possible.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100%

9. To what extent do you think the opening of the observed dataset has triggered the creation of new

□ low impact (use of the open data set resulted in fostering the creation of one new public ser-medium impact (use of the open data set resulted in fostering the creation of two to five new

strong impact (the use of the open data set has led to the creation of more than five new public

weak impact (use of the open data set resulted in provision of information for only one urban/ medium impact (use of the open data set resulted in the provision of information for two to five

□ low impact (the use of an open data set resulted in the inclusion of at least one marginalized

medium impact (the use of an open data set resulted in the inclusion of at least one marginal-

□ strong impact (the use of an open data set resulted in the inclusion of two or more marginal-

Confidence level: 0%, 25%, 50%, 75%, 95%, 100% **Reducing inequalities**

12. To what extent do you think the opening of the observed dataset has contributed to fostering awareness of social equality?

- □ no impact
- □ low impact (the use of an open data set has resulted in one social group being informed about social equality)
- medium impact (using an open data set resulted in informing two to five social groups about social equality)
- □ strong impact (the use of an open data set has resulted in more than five social groups being informed about social equality and encouraged action)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100%

13. To what extent do you consider that the opening of the observed dataset has contributed to fostering a balance between private and professional life?

- □ no impact
- □ low impact (the use of an open data set has resulted in at least one social group being informed about the current state of work-life balance)
- medium impact (use of the open data set resulted in encouraging at least one social group to advocate better working time conditions)
- □ strong influence (the use of the open data set resulted in encouraging the government to adopt at least one action measure)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100% **Governmental influence**

Transparency and accountability

- 14. To what extent do you consider that the opening of the observed dataset gave an insight into public spending?
 - □ no impact
 - □ low impact (use of the open data set resulted in information on the total public consumption of only one local/regional unit and/or government and/or public institutions)
 - medium impact (use of the open data set resulted in detailed and transparent information on public spending items of one or more local/regional units and/or governments and/or public institutions)
 - strong impact (use of the open data set resulted in up-to-date, detailed, and transparent information on public spending items of one or more local/regional units and/or governments and/ or public institutions)

Please specify all sources that support your resp

Confidence level:" 0%," 25%," 50%," 75%," 95%," 100% 15. To what extent do you think the opening of the observed dataset gave an insight into the behaviour of political parties and politicians?

- □ no impact

- wages of MPs and/or budgets of two to five political parties)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100% 16. To what extent do you think the opening of the observed dataset gave an insight into electoral processes and/or electoral results?

- □ no impact
- parliamentary and presidential elections)
- mentary and presidential elections)
- station)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100% Efficacv

- government/public effectiveness in the provision of public services?
 - □ no impact
 - ness in only one PSO segment)

 - public services)

Explain your answer as accurately as possible.

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low impact (use of the open data set resulted in information on the amount of the cost for the salaries of MPs and/or the budget of a political party) medium impact (use of the open data set resulted in information on parliamentary activity and

strong influence (use of the open data set resulted in up-to-date, detailed, and transparent information on parliamentary activity and wages of MPs and/or the budget of all political parties)

□ low impact (use of the open data set resulted in insight into the final election results of the last

medium impact (use of open data set resulted in insight into final electoral results of all parlia-

strong influence (use of the open data set resulted in insight into the final electoral results of all existing elections and referenda with the possibility of insight into the results of each polling

17. To what extent do you consider that the opening of the observed dataset has led to an increase in

use weak impact (use of the open data set resulted in improvement of government/public effective-

medium impact (use of the open data set resulted in acceleration of the public service process) □ strong impact (use of the open data set resulted in use in the provision of several different

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100%

18. To what extent do you consider that the opening of the observed dataset has had an impact on improving communication between citizens and government/public sector?

- □ no impact
- □ low impact (the use of the open data set has resulted in information that is useful for citizens in one area falling within the remit of government/public sector)
- medium impact (use of the open data set has resulted in information that is useful for citizens in two to five areas within the jurisdiction of government/public sector)
- strong impact (the use of the open data set has resulted in information that is useful for citizens in more than five areas within government/public sector remit)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100%

19. To what extent do you consider that the opening of the observed dataset has led to an increase in the effectiveness of the public administration?

- □ no impact
- □ low impact (use of open data set resulted in acceleration of one public administration service)
- medium impact (use of open data set resulted in acceleration of two or more public administration services)
- strong impact (use of open data set resulted in automation of at least one public administration service)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100% Efficiency

20. To what extent do you consider that the opening of the observed dataset has had an impact on the increase of government/public efficiency through the reduction of operating costs?

- □ no impact
- weak impact (use of the open data set resulted in occasional use in one public institution)
- medium impact (use of the open data set resulted in daily use in two or more public institutions)
- strong impact (use of open data set resulted in automation of at least one public service and reduced the need for at least one job)

Explain your answer as accurately as possible.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100% **Decision-making**

- data guided by (public) policymaking?
 - □ no impact
 - adopted (public) policy)
 - one new (public) policy)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100%

- ment of awareness of a particular topic and accountability and action? □ no impact
 - interest)
 - within the topic of public interest)
 - social group to improve a particular situation in the public interest)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100% Environmental impact

Water and/or air quality

- and/or air quality and appropriate behavioural adjustment? □ no impact
 - one area of the country)
 - two or more areas of the country)
 - for behavioural adjustment)

21. To what extent do you consider that the opening of the observed dataset contributed to the evidence/

weak impact (use of the open data set resulted in the justification of at least one previously

medium impact (use of the open data set resulted in encouraging the development of at least

strong impact (the use of the open data set resulted in the emergence of a relevant situational indicator and triggered changes in an area relevant to at least one (public) policy)

22. To what extent do you consider that the opening of the observed dataset has stimulated the develop-

use weak impact (use of the open data set resulted in information on a particular topic of public

□ medium impact (use of the open data set resulted in the incentivization of the main actors

□ strong influence (the use of an open data set has led to the encouragement of at least one

23. To what extent do you think the opening of the observed dataset has stimulated awareness of water

low impact (use of the open data set resulted in information on water and/or air quality in only

medium impact (use of the open data set resulted in information on water and/or air quality in

□ strong impact (use of the open data set resulted in up-to-date information on water and/or air quality throughout the national territory and is used in the preparation of emergency notices Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100%

Waste management

24. To what extent do you consider that the opening of the observed dataset could inform and develop users' awareness of waste management and appropriate behavioural adjustment?

- □ no impact
- use weak impact (use of the open data set resulted in information on the state of waste management in only one area of the country including the total monthly amount of waste collected and the waste collection schedule in this area)
- medium impact (the use of the open data set resulted in information on the state of waste management in only two or more areas of the country including the total monthly amount of waste collected per area and the distribution of waste discharges in these areas)
- □ strong impact (use of the open data set resulted in information on the state of waste management on the entire national territory and can be used in the development of educational materials on responsible waste management)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100% Environmentally friendly transport

25. To what extent do you consider that the opening of the observed dataset has stimulated awareness of the different sustainable transport options and appropriate behavioural adjustment?

- □ no impact
- □ low impact (use of the open data set resulted in information on environmentally friendly transport options in only one city/area)
- medium impact (use of the open data set resulted in information on options and timetables for environmentally friendly transport in two to five cities/areas)
- strong impact (the use of an open data set has resulted in real-time information on options and schedules for environmentally friendly transport in more than five cities/areas, providing insight into the amount of exhaust gases in a given city/area, and providing recommendations for selecting environmentally friendly transport in a given city/area)

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: "0%," 25%," 50%," 75%," 95%," 100%

Noise level

- of noise levels in a given area and appropriate behavioural adjustment?
 - □ no impact

Explain your answer as accurately as possible.

Please specify all sources that support your response.

Confidence level: 0%, 25%, 50%, 75%, 95%, 100%

Note

Since the guestionnaire is subject to changes due to the different potential of different datasets in solving key issues of selected problem areas, the team of responsible persons is obliged to follow the same methodology when preparing the modified questionnaire.

26. To what extent do you consider that the opening of the observed dataset has stimulated awareness

□ low impact (use of the open data set resulted in information on the level of noise produced by only one type of facility (cars/airplanes/public transport) in only one city/area)

medium impact (use of open data set resulted in information on noise level produced by two types of facilities (cars/airplanes/public transport) in two to five cities/areas)

strong impact (use of the open data set resulted in information on the level of noise produced by three or more types of objects (cars/airplanes/public transport) in three or more cities/areas)

Annex 2: Index calculation

Guide to the calculation of impact indexes³⁹

Survey type:

- a) Ex-ante
- b) Ex-post

Survey completed:

Questionnaire evaluated by: _____

Impact category	Number of points	Result	Number of points awarded/maximum
	awarded	(Max)	possible result (%)
Economic impact		40	
Social impact		20	
Social impact		20	
Governmental influence		20	
Environmental impact		20	
TOTAL		100	

Table 15 Proposed ponders for impact category

Using Table 1:

Number of points awarded/maximum possible result (%)	Interpretation (Value of the set in solving the problem area)
More than 70%	High value dataset
From 50 to 69%	Valuable dataset
Between 30 and 49%	Low value dataset
Less than 30%	The dataset is ineffective

Table 16 Proposed final index calculation

open data set is defined as:

	HIGH-VALUE	VALUABLE	LOW-VALUE	INEFFECTIVE
TOTAL				
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SOCIALIY		<u> </u>		<i>~</i>
ĞŎVĖŘŇMENTAI				
ENVIRONMENTAL				

Table 17 Open data set value mark per category

Impact category	Number awarded	of	points	Result (Max)
Economic impact of (1-9)				40 ′
Macroeconomic impact of (1-3)				15

39 The team of responsible persons decides independently on the software tool in which they will implement a guide for creating impact indices in order to maximize the automation of the process.

1. Encourages job creation
Is the answer given justified and is there at least of source listed? "YES "NO If SO, is there at least one piece of evidence/sourconfirming the veracity of the statement of reasons a the answer given?
If VES against a falloway
 Not affectedà 0 points Low impactà 1 point Mean impact ofà 2.5 points Strong impactà 5 points
If NOT, please tick the correct reply yourself and p vide a justification and at least one source to cover y claims.
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Justification:
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2. Encourages lower costs
Is the answer given justified and is there at least of source listed? "YES "NO
If SO, is there at least one piece of evidence/sour confirming the veracity of the statement of reasons a the answer given? "YES "NO If YES, assign points as follows:
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Justification:
Source:

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	3. Encourages increased productivity	5		4. Boosting growth and Enterprise Development
	Is the answer given justified and is there at least one source listed? "YES "NO If SO, is there at least one piece of evidence/source confirming the veracity of the statement of reasons and the answer given? "YES "NO			Is the answer given justified and is there at least source listed? "YES "NO If SO, is there at least one piece of evidence/so confirming the veracity of the statement of reasons the answer given? "YES "NO
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	Justification:			Justification:
	Source:			Source:
Μ	icroeconomic and sectoral impact of (4-8)	15		

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5. Encourages improvement of existing goods and ser- vices	3	[6. Encourages the development of new goods and vices
Is the answer given justified and is there at least one source listed? "YES "NO If SO, is there at least one piece of evidence/source confirming the veracity of the statement of reasons and the answer given? "YES "NO			Is the answer given justified and is there at least source listed? "YES "NO If SO, is there at least one piece of evidence/sou confirming the veracity of the statement of reasons the answer given? "YES "NO
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7. Reduces the time and cost of accessing information	3	1 Г		8. Boosts growth and development of a sector
Is the answer given justified and is there at least one source listed? "YES "NO If SO, is there at least one piece of evidence/source confirming the veracity of the statement of reasons and the answer given? "YES "NO				Is the answer given justified and is there at least source listed? "YES "NO If SO, is there at least one piece of evidence/sou confirming the veracity of the statement of reasons the answer given? "YES "NO
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Justification:				Justification:
Source:				Source:
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	9. Encourages the creation of new and innovative public	10	Γ	Ţ	10. Raises awareness of housing in a given area
	Is the answer given justified and is there at least one source listed? "YES "NO If SO, is there at least one piece of evidence/source confirming the veracity of the statement of reasons and the answer given?			l s l c t	Is the answer given justified and is there at least of source listed? `YES " NO If SO, is there at least one piece of evidence/sou confirming the veracity of the statement of reasons a the answer given? `YES " NO
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	Justification:			`	Justification.
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Tab	le 18 Explanation of point awardina for economic impact			Inc	lusion of marginalized social groups of (11)

Number of points Result awarded (Max) 20

8

Impact category

Housing of (10)

Social impact of (10-13)

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 11. The dataset contributes to the inclusion of marginalized social groups in social and/or cultural and/or political life Is the answer given justified and is there at least one source listed? "YES"NO If SO, is there at least one piece of evidence/source confirming the veracity of the statement of reasons and the answer given? "YES"NO If YES, assign points as follows: Not affectedà 0 points Weak impactà of 2 points Mean impactà 65 points Strong impactà 8 points If NOT, please tick the correct reply yourself and provide a justification and at least one source to cover your claims. Not affectedà 0 points Weak impactà of 2 points Strong impactà 8 points If NOT, please tick the correct reply yourself and provide a justification and at least one source to cover your claims. Strong impactà 6 5 points Strong impactà 8 points 	8	12. Fosters gender equality awareness Is the answer given justified and is there at least one source listed? "YES "NO If SO, is there at least one piece of evidence/source confirming the veracity of the statement of reasons and the answer given? "YES "NO If YES, assign points as follows: Not affectedà 0 points Low impact of 3 0.5 points Mean effectà 1 point Strong impactà of 2 points If NOT, please tick the correct reply yourself and provide a justification and at least one source to cover your claims. Not affectedà 0 points Low impact of 3 0.5 points Justification: Source:
Reducing inequalities (12-13)	4	

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	13. Boosts the balance between private and profes-	2	Г	14. Insight into government expenditures
	sional life Is the answer given justified and is there at least one source listed? "YES "NO If SO, is there at least one piece of evidence/source confirming the veracity of the statement of reasons and the answer given?			Is the answer given justified and is there at least of source listed? "YES "NO If SO, is there at least one piece of evidence/sour confirming the veracity of the statement of reasons a the answer given? "YES "NO
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Tab	le 19 Explanation of point awarding for social impact			

Impact category	Number awarded	of	points	Result (Max)
Governmental impact of (14-22)				20 ′
Transparency and accountability of (14-16)				5

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15. Insigning the origonical particles and poi- ticicans 2 16. Insigning the origonical particles and poi- source listed? 15. Insigning the origonical particles and poi- source listed? `YES`NO Is the answer given justified and is there at least one source listed? `YES`NO If SO, is there at least one piece of evidence/source confirming the veracity of the statement of reasons and the answer given? `YES`NO If YES, assign points as follows: Not affectedà 0 points	_	15 Indight into the helps view of political parties and rel	r i	2	1 –	1.1C Indight into all ations
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17. Increasing government/public effectiveness in the provision of public services	2	18. Improving communication between citizens and public sector
Is the answer given justified and is there at least one source listed? "YES "NO If SO, is there at least one piece of evidence/source confirming the veracity of the statement of reasons and the answer given? "YES "NO		Is the answer given justified and is there at least of source listed? "YES " NO If SO, is there at least one piece of evidence/sour confirming the veracity of the statement of reasons a the answer given? "YES " NO
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 21. Contributes to evidence/data-driven policymaking Is the answer given justified and is there at least one source listed? "YES "NO If SO, is there at least one piece of evidence/source confirming the veracity of the statement of reasons and the answer given? "YES "NO If YES, assign points as follows: Not affectedà 0 points Low impact ofà 0.5 points Mean impactà of 1 point Strong impact ofà 2.5 points If NOT, please tick the correct reply yourself and provide a justification and at least one source to cover your claims. Not affectedà 0 points Low impact ofà 0.5 points Justification: 	2.5	 22. The availability of the dataset encourages the ovelopment of awareness of a particular topic and ecourages accountability and action Is the answer given justified and is there at least of source listed? YES " NO If SO, is there at least one piece of evidence/sourconfirming the veracity of the statement of reasons at the answer given? YES " NO If YES, assign points as follows: Not affectedà 0 points Low impact ofà 0.5 points Mean effectà 1 point Strong impact ofà 2.5 points If NOT, please tick the correct reply yourself and p vide a justification and at least one source to cover yo claims. Not affectedà 0 points Low impact ofà 0.5 points
Source:		Justification:
		Source:

Table 20 Explanation of point awarding for governmental impact

Impact category

Environmental impact of (23-26)

Water and/or air quality (23)

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Number awarded	of	points	Result (Max) 20
			5

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	25. Raises awareness of the different sustainable transport options	5	l í		26. Encourages awareness of noise level in a gi area
	Is the answer given justified and is there at least one source listed? "YES "NO If SO, is there at least one piece of evidence/source confirming the veracity of the statement of reasons and the answer given? "YES "NO				Is the answer given justified and is there at least source listed? "YES "NO If SO, is there at least one piece of evidence/sou confirming the veracity of the statement of reasons the answer given? "YES "NO
1	If YES, assign points as follows:				If YES, assign points as follows:
	 Not affectedà 0 points Low impactà 1 point Mean impact ofà 2.5 points Strong impactà 5 points 				 Not affectedà 0 points Low impactà 1 point Mean impact ofà 2.5 points Strong impactà 5 points
	If NOT, please tick the correct reply yourself and pro- vide a justification and at least one source to cover your claims.				If NOT, please tick the correct reply yourself and vide a justification and at least one source to cover y claims.
	 Not affectedà 0 points Low impactà 1 point Mean impact ofà 2.5 points Strong impactà 5 points 				 Not affectedà 0 points Low impactà 1 point Mean impact ofà 2.5 points Strong impactà 5 points
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	Source:				Source:
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Annex 3: Preparation of Usage Index

As described in Chapter Usage Index, in the construction of the *ex-post* impact index it is necessary for the team of responsible persons to construct the usage index based on:

- 1. download rates,
- 2. the rate of referencing,
- 3. the user's assessment of the usefulness of the dataset; and
- 4. evaluation of the up-to-date dataset based on the up-to-date report.

	Number of points achieved	Maximum n u m b e r of points	Score/maxi- mum number of points
Total Download rate		30	·
Download rate shall be calculated according to the following		10	
formula:			
The number of points in this category shall be awarded accord-			
ing to the following scale:			
0 1-9%à 1 noint			
10-19%à 2 points			
20-29%à 3 points			
30-39%à 4 points			
40-49%à 5 points			
50-59%à 6 points			
60-69%à 7 points			
70-79%à 8 points			
80-89%à 9 points			
<u>9</u> 0-100% > 10 points			
Reference rate		10	
I he reference rate shall be calculated according to the following			
formula:			
The number of points in this category shall be awarded accord-			
ing to the following scale:			
0.1-9%à 1 point			
10-19%à 2 points			
20-29%à 3 points			
30-39%à 4 points			
40-49%à 5 points			
50-59%à 6 points			
60-69%à 7 points			
70-79%à 8 points			
80-89%à 9 points			
90-100% > 10 points			

Utility rating

The assessment of usefulness shall be assigned by the the open data set on the open data portal. The number of points in this category shall be awarded ing to the following scale: 0.1-1.4à 1 point 1.5-2.4à 2 points

2.5-3.4à 3 points

3.5-4.4à 4 points

4.5-5.0-5 points Update rating

If the up-to-date report assesses that the set of open date to date, 5 points shall be awarded.

If the up-to-date report assesses that the set of open da up to date, 0 points shall be awarded.

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Regional School of Public Administration

- ♥ | Branelovica, 81410 Danilovgrad, Montenegro
- □ respa-info@respaweb.eu
- www.respaweb.eu

