STUDY ON IMPLEMENTATION OF OPEN DATA CONCEPT BY MONTENEGRIN INSTITUTIONS

OPEN DATA FOR EUROPEAN OPEN INOVATION (ODEON PROJECT)

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Interreg Mediterranean odeon

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IMPRESSUM

API

Application Programming Interface, programmatically interface for applications

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EU open data portal

The EU Open Data Portal is the point of access to public data published by the EU institutions, agencies and other bodies. Information can be used and reused for commercial or non-commercial purposes. The portal is a key instrument of the EU open data strategy. By ensuring easy and free access to data, their innovative use and economic potential can be enhanced. The goal of the portal is also to make the institutions and other EU bodies more transparent and accountable.

Global Open Data Index (GODI)

The Global Open Data Index provides the most comprehensive snapshot available of the state of open government data publication

Good governance

Good Governance is an approach to government that is committed to creating a system founded in justice and peace that protects individual's human rights and civil liberties. According to the United Nations, Good Governance is measured by the eight factors of Participation, Rule of Law, Transparency, Responsiveness, Consensus Oriented, Equity and Inclusiveness, Effectiveness and Efficiency, and Accountability

Law on Free Access to Information

The Law on Free Access to Information ("Official Gazette of Montenegro", No. 44/12) was adopted in 2012, and has been in force since 2013. At the end of April 2017, the Law on Amendments to the Law on Free Access to Information was adopted ("Official Gazette of Montenegro", No. 30/17).
Montenegro was among the first countries to sign the Council of Europe Convention on Access to Official Documents (CETS No. 2015) on 18 June 2009. year)).

OGD

Open Government Data (OGD) is a philosophy, and increasingly a set of policies, that promotes transparency, accountability and value creation by making government data available to all. Public bodies produce and commission huge quantities of data and information.

Open Government Partnership

Global and unique partnership — one that combines these powerful forces to promote transparent, participatory, inclusive and accountable governance.

EXECUTIVE SUMMARY

Chamber of Economy of Montenegro, together with nine partner organizations from different EU countries, implements the Project "Open Data for European Open iNnovation" (project acronym ODEON), within Interreg MED program, co-financed by the European Union. Project partners aimed to increase transnational activity of innovative clusters and networks of key sectors of the MED area. ODEON project had an ambition to support the growth of Clusters and SMEs linked to S3 of the areas involved (focusing on green and blue growth and CCis) through the exploitation of Open and Big Data. There is no doubt that this project has helped to better understand open data in Montenegro, and has been a support to the Government's ongoing activities in this area.

The preparation of the Study, of which this text is a part, is the final document of the ODEON project, and among other things, it intends to further improve the situation in the field of open data, both their publication and use, and the realization of benefits that , multiplicative.

Taking into account the subject of this analysis, which is primarily focused on the work of the

Public Administration, it is important to note that the analysis was focused on the organizational framework of the Public Administration adopted by the Government of Montenegro 07/12/2020. Regulation on the Organization and Functioning of the State Administration published in the "Official Gazette of Montenegro", no. 118/2020, 121/2020, 1/2021 and 2/2021.

The Regulation stipulates the establishment of ministries and administrative bodies, administrative authorities determined that the state administration bodies are established, as well as the organization and operation of the state administration of importance for the organization and operation of state administration.

Ministries are:

1. *Ministry of Justice, Human and Minority Rights (created by merging the Ministry of Justice and the Ministry of Human and Minority Rights),*
2. *Ministry of Interior Affairs,*
3. *Ministry of Defense,*
4. *Ministry of Finance and Social Welfare, (created by merging the Ministry of Finance and the Ministry of Labor and Social Welfare)*
5. *Ministry of Foreign Affairs,*
6. *Ministry of Public Administration, Digital Society and Media, (formerly the Ministry of Public Administration)*
7. *Ministry of Education, Science, Culture and Sports (created by merging the Ministry of Education, the Ministry of Science, the Ministry of Culture and the Ministry of Sports)*
8. *Ministry of Health,*
9. *Ministry of Economic Development, (formerly the Ministry of Economy)*
10. *Ministry of Agriculture, Forestry and Water Management,*
11. *Ministry of Ecology, Spatial Planning and Urbanism (formerly the Ministry of Sustainable Development and Tourism)*

Ministry of Capital Investments (formerly the Ministry of Sustainable Development and Tourism and the Ministry of Maritime Affairs and Transport).

The names of these ministries will be used below.

This study intends to consider the current situation in Montenegro and further improve the area of open data, both in terms of their publication and use, and the realization of benefits that are, as the experience of others show, multiplicative. Its purpose is to analyze the application of open data systems in Montenegrin institutions. Considering the complex working conditions in which this analysis was conducted, as well as the moment caused by the COVID-19 pandemic, the study relies primarily on the desk research methodology.

The subject of this research was the open data portal of the Government of Montenegro, as well as all relevant laws and strategic documents developed and adopted by the Government. The interviews with the representatives of a certain number of institutions, who have the experience in publishing open data, were conducted in order to gain the insight into the hands-on perspective and processes. The analysis showed that there is not enough knowledge about the concept of open data in Montenegro. Also, regardless of the presence of significant technical and organizational capacities, these data are insufficiently used or poorly engaged in contributing to the development of this concept and the overall economy.

It is encouraging to note and acknowledge that the open data portal records the publication of a significant sets of data, which are of general importance, but that number needs to increase further. Almost all institutions have significant preconditions for dealing with the distribution of open data, especially when it comes to the readiness to publish the data. Furthermore, most institutions are currently doing it, however, not in the necessary format and adequate form.

Finally, Montenegro is on the enviable 49th place in the Global Open Data Index list, run by the Open Knowledge Network, which is an encouraging result.

December, 2020

1. INTRODUCTION

Open data is usually defined as "**...non-privacy-restricted and non-confidential data which is produced with public money and is made available without any restrictions on its usage and or distribution**"[1]. Assuming that the government itself is an open system that interacts and cooperates with its environment, then open data leads to open government data (OGD). OGD provides not only the access to data and information but also changes and expands the boundaries between the public and its governmental institutions. OGD in itself is not only the publication of data, but it also includes users' feedback so as to improve governmental performance and mechanisms for monitoring. Its three pillars are the accountability, citizen participation and transparency which help to create and co-create value.

OGD are non-personal data sets that could and should be accessible to the general public, free of charge. Open data guarantees greater transparency in the work of state bodies at national, regional and local level, encourages efficiency inside and outside the government, and enables citizens, companies and organizations to use public data more than once for various purposes and in order to create and co-create value. Open data strengthens and enhances entrepreneurship, influencing the development of innovative products and

[1] M. Janssen, Y. Charalabidis and A. Zuiderwijk, Benefits, adoption barriers and myths of open data and open government, Information Systems Management, vol. 29, no. 4, pp. 258-268, 2012.

services, providing tools for alternative decision-making in the fields of management, planning and science, and contributing to the creation of a knowledge-based economy. In addition, open data creates added value for governments, including better public services, reducing the burden on public administration and increasing cooperation with citizens, businesses and organizations.

WHAT PURPOSE DO OPEN DATA SERVE?

1. **Open data is a standard in public administration.** Open data are proactive initiatives of the governments to share the public sector information. Closed data are only available provided there is an explicit justification.
2. **Open data can be reused.** Open data may be used and harnessed multiple times, and for commercial purposes, either free of charge or at an acceptable fee. In this regard, open data uses simple standardized license models.
3. **Open data applies open standards.** Open data is not fully open until open standards are applied. Open Data applies open formats and open interfaces.
4. **Open data should come from authentic data sources,** whenever possible. The development of authentic data sources will lead to reliable, high-quality data and information in the public sector.
5. **Open data uses an integrated approach.** Local authorities are also the main providers of data. Moreover, the link with the state level should not be neglected. Cooperation at all levels of local government provides high added value.
6. **Information on management processes in the state administration in the central directory.**

Information held by public authorities and their opening are extremely important for the transparency of public administration and have great economic potential. Not only that, they also contribute to participatory democracy where the citizens are provided with the necessary information in order to engage on an equal basis with government bodies. This has particularly proven to be the case with the Internet revolution and as the information and communication technologies have advanced over the past few years. **To that end, open data represent pieces of information created by the actions of public authorities, the use of which for commercial and / or non-commercial purposes can create added value.** Furthermore, there is a growing need for this kind of data as the public administration bodies all across the world have undertaken many initiatives to re-shape themselves into e-governments. This concept reinforces the idea and benefits of openness which include

citizen-government collaborative service delivery for social and economic value.

Data sets suitable for reuse are geographic information, statistics, meteorological data, weather data, public registers and alike, particularly in the fields of transport, energy, science and technology, tourism, health, education, climate change, etc. These data can be combined from several different sources to form the basis for new solutions to a different set of problems. **This, in turn, creates an added value that can help new companies emerge, generate and create new jobs.**

Open data is digital data available on the Internet, which can be further published and reused for a purpose other than that for which it was created. They are published in a format that can be computer read, processed and analyzed. Many open data initiatives actually involve converting data that is already publicly available into formats that are suitable for reuse. This makes them a powerful tool for more efficient and transparent public administration and the involvement and participation of citizens and the private sector in the work of public authorities. Furthermore, open data bring accountability in public services and help the policy making process of the institutions themselves.

Open data is based on the following six principles established by the 2015 Charter (International Open Data Charter)[2]:

1. In principle open
2. Timely and comprehensive
3. Affordable and usable
4. Comparable and interoperable
5. To improve the management and engagement of the civil sector
6. For inclusive development and innovation.

Open data must not contain personal data, as well as other legally protected data, as defined by the relevant national legislation and EU policies such as the General Data Protection Regulation (GDPR). This is, in fact, a key requirement of the principle of openness, which includes the right of state institutions to retain certain data. The main goal of retaining one set of data is to justify the trust of citizens who must be ensured that their right to privacy is well protected in the process of opening data.

The principle of timeliness and comprehensiveness implies that open data are only valuable if they are still relevant. Data sets that are not relevant at a given time, therefore, cannot be interpreted as open data, so it is recommended to publish them in a timely and comprehensive manner, in the original and unmodified form, when possible.

The principle of accessibility and usability ensures that the data is readable and easy to find. One way to achieve this is the establishment of a clear, easy to navigate and user-friendly

[2] https://opendatacharter.net

Open Data Portal. The experience of users who access information, use and reuse the files of various different formats that contain data, must be considered and taken into account at all times. The data should be free, based on an open license, such as those developed by Creative Commons[3]. These are the licenses that strike a balance within the traditional "all rights reserved" setting created by the Copyright Law. This tool provides support to various entities, ranging from individual creators to large companies and institutions, granting a simple, standardized way to implement copyright regarding their creative work.

Open data provide citizens with significantly better insight into the work of institutions and public administration bodies, which has proven to be a meaningful mechanism for improving the work of public services. This data is designed for public consumption, and is democratic by its core features and nature. They are used to open new businesses, analyze certain trends and patterns, make the best possible decisions which would be data-driven, and solve challenges and problems the society faces. The degree of transparency of the work of the public administration contributes to the greater involvement and engagement of citizens in their activities, thus enabling and allowing for the creation of better solutions for the society as a whole. In this regard, transparency refers not only to the availability of data, but also to the possibility of sharing and reusing them, stimulating at the same time greater participation and collaboration. Exactly this is one of the basic, and most important and relevant characteristics of open data. However, even though national, regional and local governments are the main and the biggest sources of this kind of data, civil society organizations and private entities are also their big generators.

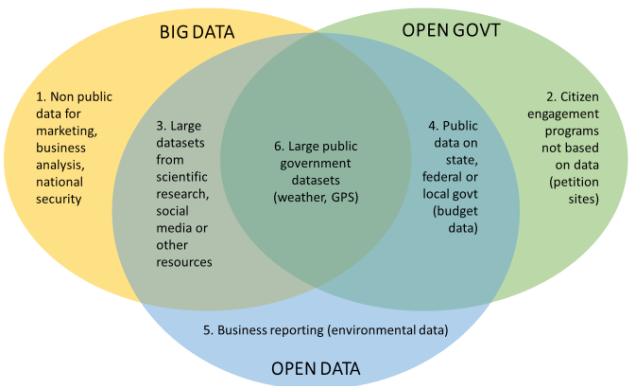


FIGURE 1: OPEN GOVERNMENT DATA SCHEME

Finally, open data can help foster inclusive economic development[4]. Greater access to data creates, among other things, a critical awareness of all actors in the society, thus helping identify problems at the local and regional level and encourage the creation of ideas for solving them. On the other hand, a higher degree of inclusion is directly related

[3] https://creativecommons.org/licenses/ [4] https://www.stateofopendata.od4d.net/chapters/stakeholders/private-sector.html

to the economic development component, enabling more dynamic investment activity and implementation of development projects, thanks to the quality and quantity of open data.

Very often it happens that one does not really understand the true meaning of the information relevant to the public (public data or **Open Gov**) and open data (**Open Gov Data**). Furthermore, these terms are also related to and often mixed with big data i.e. large datasets processed using advanced analytical techniques.

Both concepts share a common goal, that it, increase transparency and accountability in the work of public office holders, as well as improve the availability and control of public administration. This ultimately results in the establishment of "good governance" and the rule of law in general.[5]

1.1. Exceptions of open administration

Even if a public sector institution has a full ownership of the data, this does not automatically mean that these data are and should be available to the general public. In some cases, particular information may not be published to protect certain legal interests. For each dataset to be available as an open data set, it needs to go through scrutiny to see whether exceptions apply. Based on the examples of good practice from the European Union countries, we can say that the data cannot be made public in the following cases:

1. If the publication affects the obligation of the public sector institution to maintain confidentiality.
2. If the disclosure of information affects the protection of privacy (unless the data subject agrees to the disclosure of the data).
3. If the publication affects the secrecy of the work of the Government and the competent bodies that depend on it, the Parliamentary bodies and other public sector institutions.
4. If they concern administrative documents collected exclusively for the purposes of criminal or administrative proceedings.
5. If they refer to administrative documents that were collected exclusively for the possible application of disciplinary measures, while the possibility of disciplinary measures still exists.
6. If they refer to administrative documents that contain data obtained from an independent person, whereby that party is not obliged to provide them and which that party has marked as confidential (unless that person agrees to publish the data).

[5] https://i.pinimg.com/originals/0b/22/d5/0b22d55fe9521783f81236195e6e66e2.jpg

7. If the publication affects the financial and economic interests of the public sector institution.
8. If the publication affects the confidentiality of data relating to international relations or relations with supranational institutions and other communities and regions.
9. If the significance of the disclosure is not more important than the nature of the confidentiality of commercial and industrial data, when such data are protected to ensure legitimate economic interests (unless the originating party disagrees with their disclosure).
10. If the importance of disclosure affects the administration of justice in civil or administrative proceedings or the possibility of a fair trial.
11. If the importance of disclosure affects the confidentiality of the work of public sector bodies, or if the confidentiality of data related to administrative execution, internal audit or political decision-making is required.
12. If the publication affects public order and safety.

Re-using personal data, can help organizations understand user behavior and target their marketing activities more effectively. Because personal data is information relating to a person who can be identified, directly or indirectly by the data, the right of privacy should be of concern in this case. The right of privacy is a human right anchored in most modern democracies. In Article 8 of the European Convention on Human Rights, it states that "Everyone has the right to respect for his private and family life, his home and his correspondence." Due to the fact that processing personal data violates the privacy of individuals, the use of personal data is regulated by the law and these data cannot be used or reused as such.

WHAT IS THE AIM OF GDPR?[6]

In order to set a legal framework for data privacy in the mid-1990s, the Directive 95/46/EC was adopted by the European Commission. During that time, the internet was still a recent innovation and social media was not wide-spread yet. Since then, the technology and the re-use of data outgrew the Directive, making its update necessary and mandatory. In order to ensure data privacy, regulations had to expand to digital privacy breaches. Regulation (EU) 2016/679 (the General Data Protection Regulation, or "GDPR") replaces the Directive 95/46/EC with the aim to raise awareness, transparency and compliance. Furthermore, this Regulation lays down rules relating to the protection of natural persons with regard to the

[6] https://www.europeandataportal.eu/en/highlights/protecting-data-and-opening-data

processing of personal data and rules relating to the free movement of personal data. It sets the principles relating to processing of personal data, the conditions and the procedures which need to be undertaken and ensured.

WHAT KIND OF DATA IS CONCERNED BY THE GDPR?

To help understand GDPR related to Open Data, two definitions of data can help.

Personal data is "any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person". GDPR deals exclusively with personal data.

Open Data refers to data which is open for free access, use and modification to be shared for any purpose. The principles for Open Data are described in detail in the Open Definition. Open Data cannot be considered open if it is not accompanied by a license that ensures its free re-use.

WHAT ARE THE IMPLICATIONS OF GDPR FOR OPEN DATA?

There is still a misunderstanding about how protecting data and opening data can pursue the same goal. GDPR deals exclusively with personal data. The only situation when GDPR directly affects Open Data is when Open Data includes personal data. According to GDPR, European citizens must give their clear and explicit consent to the processing of their data. Therefore, no personal data can be published for re-use without the consent of the affected party.

There are a few exceptions, when personal data can be published:

1. If there are legitimate reasons to publish data. For example, in the case of a court decision. This rule restricts privacy rights in general.
2. If the data has been anonymized.

1.2. Possible access to open data

When talking about working with data and documents created and generated by the public administration bodies, one should keep in mind the special context of all factors, – including political, legal, financial and technical.

There are two dominant methods for data sharing. Here, we talk about the so-called API and bulk methods. The main difference among them is that API is used first then when the user needs to download a certain part of the data set, while the bulk method applies in cases when the user wants to download over overall data set.

Both methods, of course, have their own advantages and disadvantages. In line with that, both of them are used for different situations and scenarios.

Method API

(Application Programming Interface, programming interface for applications)

Essentially represents a software (the program) which "communicates" across internet with other software (programs, websites) in order to gather open data.

Imagine your computer being the API program that “talks” over the internet with other program (website), all for the purpose of gathering data from it in a machine-readable format.

A request which the API sends in the process communication is similar to that when in a web browser the user types a web address and gets a web page opened as a result of this action. Only here, instead of a website that looks nice, you get data which are designed so your API (software) can read and use them. This is often becoming a mode of exchange of data between the institution/agency and the company.

Advantage of the API method is that, since large sets of data are available and you need it only one part (fragment), this method allows you to download only those data which are relevant to you. Deficiency of this method is that it is useful to the developers and programmers, because programming knowledge is required in order to be able to create one API in the corresponding technology.

Bulk method

is another way of sharing open data via files (documents).

This way, the users, in a few clicks, download a complete set of data from a particular website in a machine-readable and open format. It is said that data is bulk (fully) shared if the user can easily and simply access and download the entire data set. On the other hand, if the user could download only one part of the data set, this is no longer a bulk method.

The advantage of this method is that it can be used by everyone, not just developers. On the plus side, creating, sharing and maintaining such datasets is very easy and simple, but also cheap, because these sets are files (electronic documents) that are stored on a specific website and are ready for download.

The disadvantage of this sharing method is reflected in those data sets that are subject to frequent changes, because it is impractical for users to download regularly new, updated entire files from the web page. Another drawback occurs with large data sets, where the user needs only one segment (fragment) of that set that wants to analyze, and yet must take over the whole set (data set).

1.3. Limitations in the process of opening data

Obstacles or restrictions to the disclosure of data may be found in the domain of policy, organization, law, technical conditions or finance. Public policies addressing the issue of data opening must, therefore, have in mind and take account of all these different and intertwined aspects.

Also, the awareness of the availability of open data should be raised and focused on, on the one hand, as well as the specific needs of open data users. Moreover, it is of utmost importance that there is a dialogue between those who publish the data and those who use them.

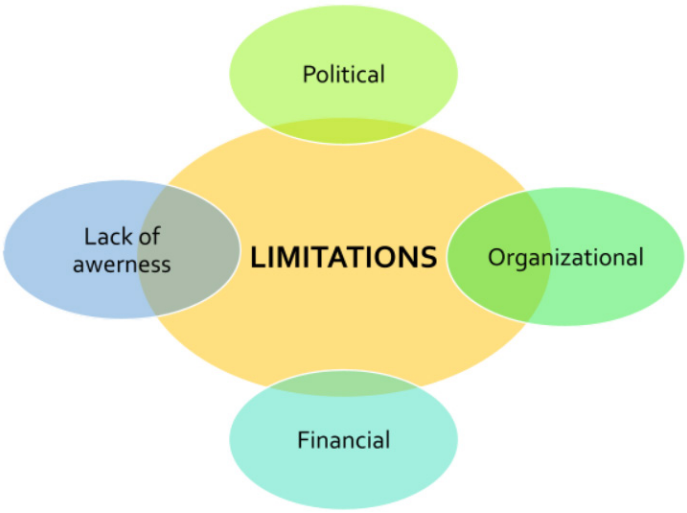


FIGURE 2: LIMITATIONS IN THE PROCESS OF OPENING DATA

All limitations can be grouped into four main categories:

Political constraints - decision makers set priorities, incorporating the concept of open data into their plans, and those decisions they should be operationalized and implemented within the administration;

Organizational constraints - from an organizational perspective, one can observe how a particular organization enables or hinders the publication and use of open data; in terms of internal structure, data disclosure should become an integral part of internal procedures;

Financial constraints - certain financial resources are required to open data; for some authorities, the transition to creation data also means a loss of source of income, because it means that they will have to stop charging access to certain data;

Lack of awareness - values and potential benefits of the open data are not always recognized or known, both looking from the perspective of those who should publish them and those who are their users.

1.4. Promotion of the Open Data concept

Given the growing importance of open data around the world, in almost all spheres of life, the importance of how these benefits will be adequately promoted is also raised. Undoubtedly, the opinion of almost all factors and actors that the crucial role in promoting the benefits, values and advantages of the production, storage and distribution of open data belongs to the government sector.

PROVIDER.

Across all levels of government in all regions of the world, millions of individual data records are collected, stored, and analyzed. From tax returns and unemployment claims to hospital reimbursements and energy use, much of this information can be made available electronically and readily shared, enabling third parties to create innovative products and services.

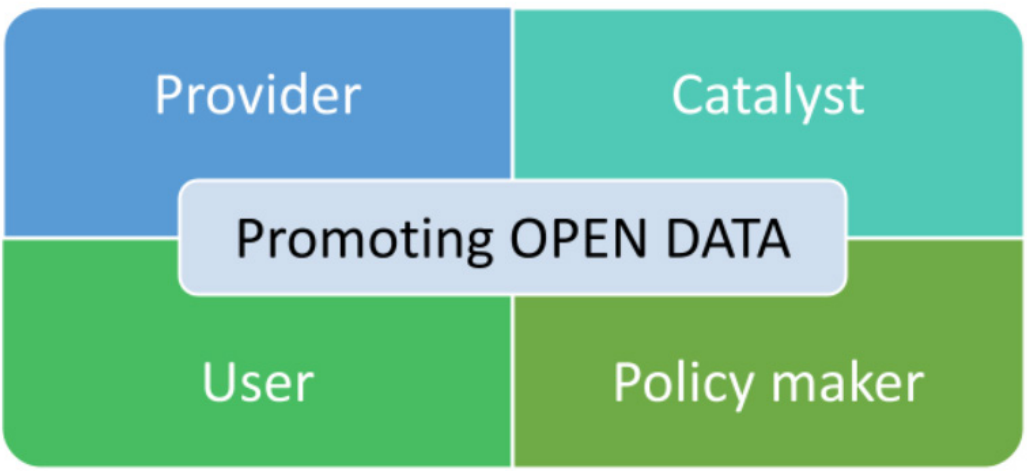


FIGURE 3: PROMOTING OPEN DATA FACTORS

CATALYST.

Government can serve as a catalyst for the use of open data by creating a thriving ecosystem of data users, coders, and application developers. To attract an ecosystem of developers, it can advertise open-data availability through press releases or other marketing materials. One approach involves organizing events such as “hackathons” and other competition forms, often with prize money and publicity.

USER.

While open-data programs are frequently designed to unlock the innovative capacity of those outside government to use previously hidden data, these programs often enable government agencies to overcome their own internal barriers to using data from other parts of the government. There are two key actions that government agencies can take to use open data. First, to optimize the use of public data within their own agencies, government leaders can invest in talent, tools, and systems. This includes hiring and training staff at all levels — even those not in technical roles — about how to use data to make better decisions, including designing experiments, as well as the benefits of providing data to third parties. Second, governments can apply advanced analytics to improve internal decision making, promote the creation of new services, and increase accountability.

POLICY MAKER.

Public-sector leaders are often called on to protect individuals and organizations from the risks of open data while also advancing open data's potential value. Risks include those that fall largely on individuals, such as privacy, security, and personal safety, and those related primarily to organizations, such as confidentiality, liability, and intellectual property. Leaders can draw on their legislative authority and enforcement powers to enhance safety, security, equity, and justice for all members of society. They can also participate in setting technical standards that can significantly increase and scale the benefits of open data.

1.5. Open data and policy decision-making

Public sector policy decision-making has come under increasing scrutiny in recent years due to top-down decision-making processes adopted by the elected government representatives and the lack of associated transparency or evidence of value created through implemented policies. **With the increasing focus on online web platforms and social media channels, governments are urged to make the policy decision-making process more transparent and collaborative in order to engage with all stakeholders.**

Public sector data has, for a long time, been available to some extent (not always). For example, data from publicly-funded research to public bodies and other organizations for use in policy appraisal and modelling tools, albeit with costs and restrictions.

In particular, **restrictive licensing and charging for reuse or public sector data was standard until challenged by the concept of "open data"**, as defined by Phillipp Mueller (2014) as "a philosophy and practice requiring that certain data be freely available to everyone, without restrictions from copyright, patents or other mechanisms of control".

One of the unforeseen effects of the open data movement has been to make more data easily accessible to other actors in the policy space, including researchers, think-tanks, and, most significantly, other parts of the public sector and governmental systems.

The opening of data sets and their further distribution, as well as their reuse, represent a good basis for achieving the basic principles prescribed by the OGD initiative. Open data provide a good basis for strengthening transparency, reducing opportunities for corrupt practices, supporting the development of competitiveness and stimulating innovative ventures. Also, **by achieving a greater degree of transparency, preconditions are created for more active participation of citizens and other factors of society to initiate proposals, which, as a result, should lead to a new level of social welfare.**

1.6. State of open data

Having in mind the European level, the main point of access to find public sector information published across Europe since 2015 is the European Data Portal (EDP). Its objective is to improve access to open data, foster high-quality open data publication at national, regional and local level, and increase the impact through re-use. To support the development of countries in terms of their open data practices and enable them to learn from each other, the EDP has been conducting an annual benchmarking exercise providing European countries with an assessment of their maturity level and documenting their year-on-year progress.

Open data policies in the EU27 Member States vary from laws that are put into effect by implementing EU directives (Directive (EU) 2019/1024 of the European Parliament and of the Council), to extensive policy frameworks dedicated to open data or embedded into the broader legislative framework on data and digital developments.

In 2020, 96% of the Member States indicate having adopted an open data strategy or an equivalent. Not all countries have developed a strategy exclusively focusing on open data, but rather have the open data aspect embedded into broader digital and data related strategies for open government. Moreover, the open data elements are often part of multiple strategic documents with their own dedicated focus.

Clear action plans, and criteria by which their delivery is measured, support in ensuring that the vision and goals defined in the national open data strategies are reached. In 2020, all EU27 Member States indicated that they will be implementing an action plan to carry out their national open data strategy. In response to the upcoming Open Data Directive requirement to publish high-value datasets, 89% of Member States have prepared by anticipating the identification of high-value domains or datasets to be prioritized for publication. All 27 EU Member States indicate to have a governance structure in place to enable the participation and inclusion of various open data stakeholders. The governance structure mainly serves the goal of assisting data providers with their open data publication process. In many countries (89%), the governance structure and operating model are published online and accessible to the public.[8]

When we talk about the potentials of open data, it is necessary to emphasize the following:

[8] Open Data Maturity 2020 Report - European Data Portal - https://www.europeandataportal.eu/sites/default/files/edp_landscaping_insight_report_n6_2020.pdf

The open data market in the EU in 2019 was worth € 184.45 billion

€ 199.51 - € 334.20 billion open data market size forecast for 2025

15.7% growth expected from high impact and high potential sectors

Saving healthcare costs, e.g. € 312 - € 400 thousand due to faster first aid by bystanders (thanks to Open Data-based applications)

Saving labor costs, e.g. € 13.7 - € 20 billion by reducing time spent in traffic

Saving costs on energy bills, e.g. € 79.6 billion due to more solar energy production

Saving public sector costs, e.g. € 1.1 billion by lower translation costs

FIGURE 4: ECONOMIC POTENTIAL OF OPEN DATA

Global consulting firm McKinsey has published in October 2013 the study "Open data: Unlocking innovation and performance with liquid information", in which they presented an estimate of the potential use value of open data worldwide. In the seven identified areas this value is approximately 3 trillion USD (3,000,000,000,000,000) annually.

The benefits of opening data and the value of open public data are unequivocal for both central and local levels of government, the entire economy, and the citizens.

In addition to increased transparency, open data is the basis for greater information and citizen participation, for better, cheaper, and newer public services. They are the basis of research and scientific knowledge, social and economic innovation.

For all these reasons, the process of opening public data has become an integral part of the international development agenda, once it has been recognized as a political priority, first in the United States and Great Britain, and then in the European Union.

[9] The Economic Impact of Open Data, Opportunities for value creation in Europe - https://www.europeandataportal.eu/sites/default/files/the-economic-impact-of-open-data.pdf

1.6.1. Examples of good practice

Over the past several years, governments around the world have become committed to a greater extent to making their activities and decisions more transparent and open. International comparisons of the practice when it comes to open data enable us to acquire an understanding of commonalities and differences in national experiences, contributing to better understanding of the impact of these policies. In addition, comparing and contrasting this information will contribute to the understanding of key processes and resources that are required, as well as the process of institutionalization and prospects for long term sustainability of these ideas.

*In **Poland,** the open data policy is pursued by the Ministry of Digital Affairs. In 2018, the first version of a document specifying the open data legal, security, technical and API standards was issued and has been updated in 2020 after an evaluation and public consultation.*

*In **Bulgaria,** the open data strategy is developed in detail in several strategic documents. The strategy is part of the "Strategy for Development of the State Administration 2014-2020" and the roadmap for its implementation, as a key priority "Developing the Open Government Partnership Initiative and publishing available public information in an open format".*

*In **Italy,** the national strategy emphasizes the complementarity between the national, regional and local levels of government and identifies priorities and actions to be carried out and measured against specific indicators. More recently, the "Italy 2025 - The Strategy for Technological Innovation and Digitization of the Country" was published, which promotes the use and sharing of data by public administrations and stakeholders.*

*In **Romania,** an open data strategy has been developed in 2020, which complements the implementation of the Open Data Directive and is in the process of being submitted for public consultation.*

*In **Slovenia,** a digital strategy was being prepared at the moment of the assessment, which includes a focus on open data. In addition, a "Strategic Working Plan for Open Data 2020-2021" has been prepared and is under consultation with the country's stakeholders. The plan includes events, meetings, upgrade targets for the portal, educational activities, etc. for the next two years. Also, the manual on the opening of public sector information is made available on the national portal. The guidelines include the following topics: definition of open data, strategic and legal basis, access and re-use, licenses, metadata, linked data, etc. It has been promoted and used for the training of the editors and other civil servants by the Administrative Academy of the Ministry of Public Administration.*

*In **Austria,** the "Framework for Open Government Data Platforms" determines that real-time data needs to be retrievable through an API. The published records should be available* to the

public within an adequate period in a timely manner. They must be published as soon as they are collected and compiled.

In the ***Russian Federation***, the institution responsible for open data at the national level is the Open Data Council (ODC), whereas the Ministry of Economic Development plays a key role in the implementation of the Open Data Policy. ODC is in charge for the coordination and vision for open data development and publication. It establishes key priorities thus ensuring they are well respected and examines government information systems to find and recommend the publication of potentially valuable datasets. Government Order 1187 requires that all agencies publish at least ten datasets as open data.

In the ***United States***, the open data concept began more potently with an executive action of President Obama and his Memorandum on Transparency and Open Government, adopted in January 2009. This was eventually articulated in an executive order signed by the President in May 2013 that established the Open Data Policy which made open and machine-readable data the default standard for government data. The aforementioned policy was intended to advance the management of Government information as an asset in order to promote interoperability and openness, and, wherever possible and legally permissible, to ensure that data are released to the public in ways that make the data easy to find, accessible, and usable. In order to engage stakeholders, the Government and relevant bodies in charge for open data track the datasets that have been prioritized through public engagement or other activity related to engagement efforts (such as format changes, API development, quality improvement, or other communication activity) and links that activity to specific mechanisms for engagement and feedback (such as open data events, IdeaScale, GitHub, Twitter, etc).

2. OPEN DATA IN MONTENEGRO

The activities carried out by the former Ministry of Public affairs, digital society and media in coordination with the EU in the area of publishing open data of Montenegrin institutions, resulted in the publication of data sets from the Montenegrin national portal on the European open data portal[10]. In this way, the data published by Montenegrin institutions have become transparent and available to the wider European and world public, and thanks to that, Montenegro is among those European countries with the high ranking in the field of data openness.

The open data portal www.data.gov.me, managed and administered by the Ministry of Public affairs, digital society and media, is implemented in cooperation with all institutions that, in accordance with the Law on Free Access to Information (Official Gazette of Montenegro", No. 44/12 and 30/17), have the obligation to publish this data for reuse. The portal contains data in a machine-readable and open format, in accordance with the open standards, in a way that makes it easy to navigate and search through. This means that data documents must be standardized and available in a format structured in such a way that software applications can easily recognize and read it, all in order to enable easier access to information that is the subject of reuse. The portal contains data available for use and publication without restriction, together with useful information about the data itself (metadata), such as what exactly the data sets refer to, for what period of time are they valid, who published them and when, and other that allows their easier search. Currently,

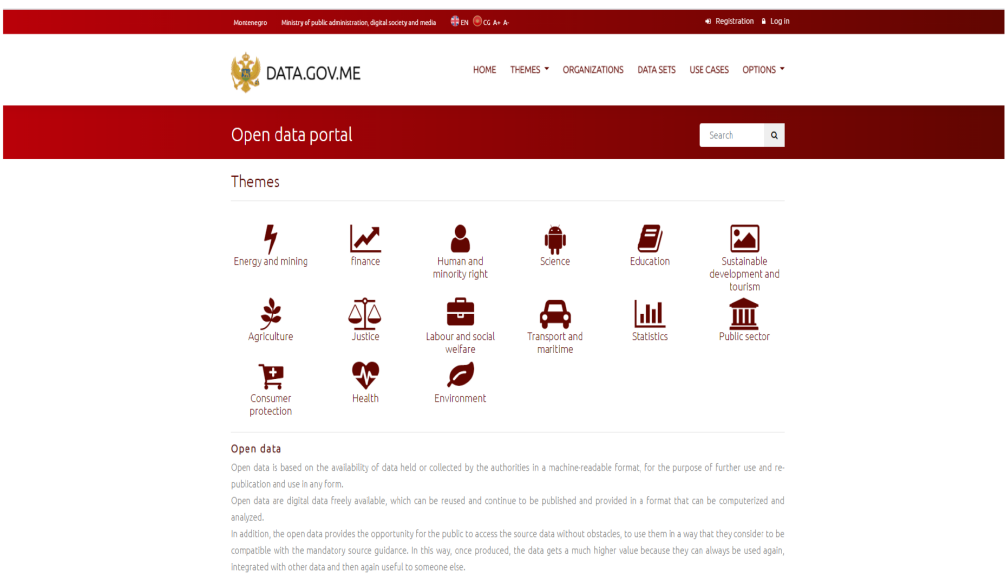


FIGURE 5: MONTENEGRIN OPEN DATA PORTAL – THEMES

[8] https://data.europa.eu/euodp/en/home

there are 132 data sets available for reuse on the portal, which are under the jurisdiction of several ministries and administrative bodies, and continuously, in cooperation with other institutions, the Ministry is working on the selection of important data sets. In the next period, end users can expect a new phase of publishing new information, as well as their adequate download and use.

The main goal of the e-Government Open Data portal project is to improve the transparency of public administration, so that data or information, which are often published in formats unsuitable for reuse (such as PDF, scanned PDF, word, etc.) are published in an open and uniform format, so that their greater utilization would be achieved. Data reuse includes the ability to download, distribute, customize, connect to other data, integrate into business processes, products and services, etc. By publishing them in an open format, the data becomes available to a wider circle of users.

The Ministry drafted the Rulebook on the manner of publishing information in an open format ("Official Gazette of Montenegro", No. 53/18) provided for in the Article 12, paragraph 3 of the Law on Free Access to Information ("Official Gazette of Montenegro", No. 44/12 and 30/17). As a part of this Law, there is a program instruction which regulates the manner of publishing government information in an open format.

This Law prescribes the manner of publishing information in an open format on the e-government portal, a central point of access to all government bodies. **Publication of information in this format implies publication, categorization and distribution of information held by public authorities in an open form.** Furthermore, open form is a document format that is independent of the software platform used and available to the public without restrictions that would prevent the reuse of information (XML, CSV, JSON and other similar formats).

In order to manage the publication of information in an open format, the authority appoints an administrator to whom user rights are assigned to work on the Portal. The administrator of the portal assigns user rights to work on the Portal to the administrator of the Portal by opening a user account, at the request of the authority.

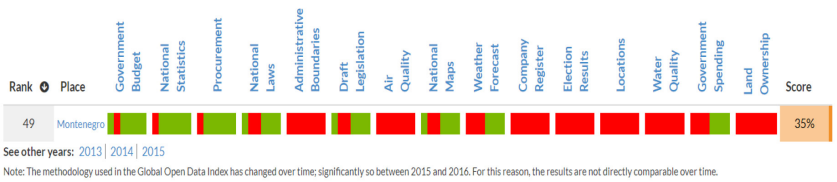


FIGURE 6: GLOBAL OPEN DATA INDEX – MONTENEGRO

According to Global Open Data Index, **Montenegro is ranked as the 49th[11] country in the world when it comes to data openness. The Global Open Data Index (GODI) is the annual global benchmark for publication of open government data, run by the Open Knowledge Network.** This crowdsourced survey measures the openness of government data according to the Open Definition[12].

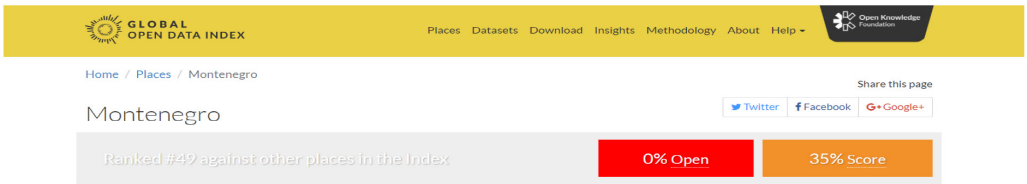


FIGURE 7: GLOBAL OPEN DATA INDEX – MONTENEGRO OVERALL SCORE

The Global Open Data Index is an independent assessment of open government data publication from a civic perspective. GODI enables different open data stakeholders to track governments' progress on open data release. GODI also allows governments to get direct feedback from data users. The Index gives both governments and users a baseline for discussion and analysis of the open data ecosystem in their country and internationally. All interested parties are encouraged to participate in an open dialogue to allow for ownership of the results and to make the Index as relevant as possible.

FIGURE 8: OPEN DATA CRITERIA, GODI

[11] Last published analysis for 2016 - https://index.okfn.org/place/me/
[12] https://opendefinition.org/

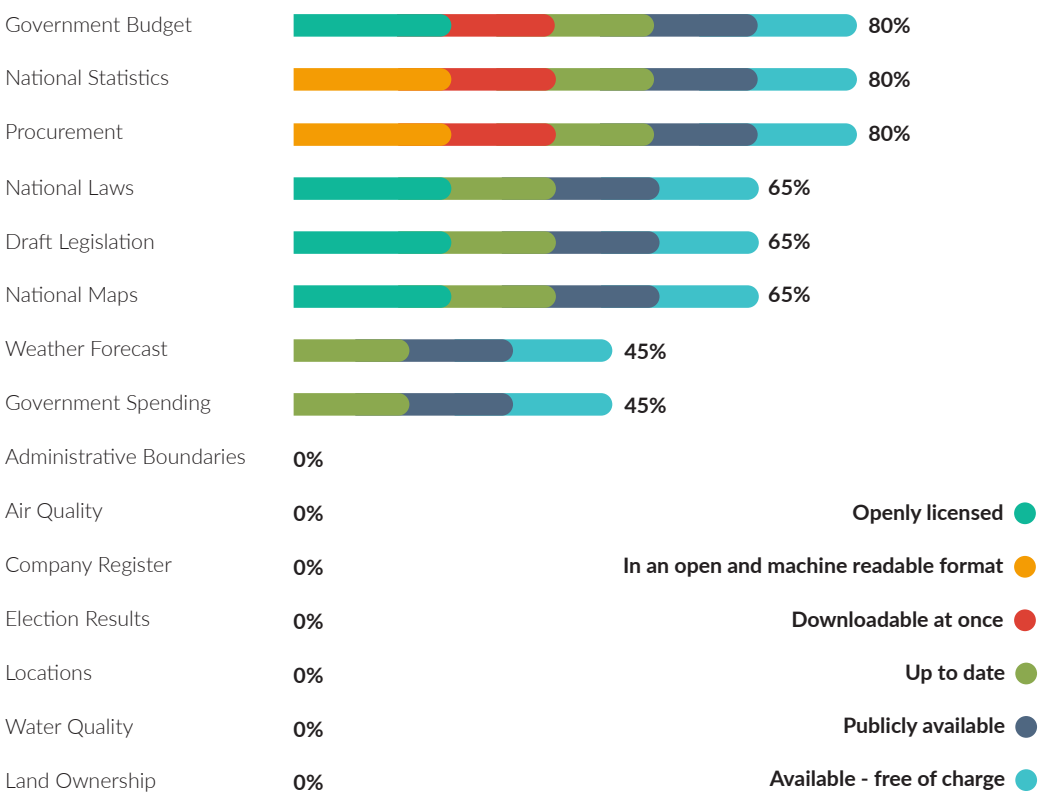
The Global Open Data Index (annual) explores 15 different datasets according to the six criteria that determine the extent and characteristics of open data, including:

1. **Openly licenced** - A license is a document that specifies what can and cannot be done with a work (whether sound, text, image or multimedia). It grants permissions and states restrictions. Broadly speaking, an open license is one which grants permission to access, reuse and redistribute a work with few or no restrictions.
2. **In an open and machine-readable format -** Machine readable data is data structured in a format that can be understood and processed by a computer. Some file formats, such as a PDF or Word documents, are human readable and easier to read and edit. This differs significantly from machine readable formats that can be processed by a computer and parsed or organized around specific information.
3. **Downloadable at once –** means that data are available for download, without having the necessary data processing and their systematization. Such data or data sets are available for download at one or more addresses.
4. **Up to date –** the data are calibrated according to the time series to which they refer and at a given moment most closely reflect the actual situation on the ground.
5. **Publicly available -** are available to everyone, without prior conditions and additional.
6. **Available -** free of charge.

Overall ranking score of Montenegro is 35%, based on weighted questions, displayed as a percentage of the maximum possible score.

According to the Global Open Data Index, the percentage of datasets that are fully open in Montenegro, as described by the Open Definition, is unfortunately 0%.

Find below the overview of the above-mentioned characteristics when applied to Montenegro, and the country score for every one of them.



GRAPH 1: GLOBAL OPEN DATA INDEX – MONTENEGRO DATASETS SCORE

Government Budget sore is 80% - National government budget is at a high level, that is, the planned government expenditure for the upcoming year, and not the actual expenditure. Open budget data allows for well-informed publics: showing where money is spent on, how public funds develop over time, and why certain activities are funded. *When it comes to data from this set in Montenegro, what is missing is an open and machine-readable format.*

National Statistics score is 80% - This parameter includes key national statistics on demographic and economic indicators such as Gross Domestic Product (GDP), or unemployment and population statistics. *When it comes to data from this set in Montenegro, what is missing is an openly licensed format.*

Procurement score is 80% - This includes all tenders and awards of the national/federal government aggregated by each office. It does not look into procurement planning or other procurement phases. Open procurement data may enable fairer competition among companies, allow to detect fraud, as well as deliver better services for governments and citizens. Monitoring tenders helps new groups to participate in tenders and to increase

government compliance. The Index draws on work from the Open Contracting Partnership. *When it comes to data from this set in Montenegro, what is missing is an openly licensed format.*

National Laws score is 65% - This data category requires all national laws and statutes to be available online, although it is not a requirement that the information on legislative behavior, such as voting records, is available. *When it comes to data from this set in Montenegro, what is missing are an open and machine-readable format, including downloadable datasets at once.*

Draft Legislation score is 65% - This is the data on the laws discussed within national parliament as well as the voting procedure (not to mix with the adopted national laws). Data on laws must be available for the current legislation period. Open data on the law-making process is crucial for parliamentary transparency: what does the law text say and how does it change over time; who introduces the law; who votes for and against it; where is the law discussed next, so the public can participate in the debates? *When it comes to data from this set in Montenegro, what is missing are an open and machine-readable format along with downloadable datasets at once.*

National Maps score is 65% - This is a geographical map of the country including national traffic routes, stretches of water, and markings of heights. The map must at least be provided at a scale of 1:250,000 (1 cm = 2.5km). Geographic information is instrumental for many use cases, including the mapping of unemployment statistics or demographics, as well as journey planning. *When it comes to data from this set in Montenegro, what is missing are an open and machine-readable format along with downloadable datasets at once.*

Weather Forecast score is 45% - These are three-day forecasts of temperature, precipitation and wind. Forecasts must be provided for several regions in the country. Short-term weather forecasts are relevant for the general public to plan the activities, while at the same time it helps being reliable. *When it comes to data from this set in Montenegro, what is missing are open licenses, open and machine-readable format along with downloadable datasets at once.*

Government Spending score is 45% - These are the records of actual (past) national government spending at a detailed transactional level. Data must display ongoing expenditure, including transactions and subsidies. A database of contracts awarded or similar will not be considered sufficient. Open spending data shows whether public money is efficiently and effectively used. It helps to understand spending patterns, and to display corruption, misuse, and waste. *When it comes to data from this set in Montenegro, what is missing are open licenses, open and machine-readable format along with downloadable datasets at once.*

Unfortunately, seven sets of published data relating to administrative borders, air quality, business register, election results, location, water quality, land ownership does not meet any criteria necessary for categorization as part of the open data.

2.1. Legal framework

The right to access information held by state administration bodies exercising public authority is a right guaranteed by the **Constitution of Montenegro**, which is prescribed in more detail by the **Law on Free Access to Information** ("Official Gazette of Montenegro", No. 44/12 and 30/17). At the same time, access to information as well as the transparency and openness of these authorities are highlighted in the Government's key strategic documents and action plans as fundamental pillars of the development of democracy, political responsibility and quality public services. **The role of information and communication technologies, and especially the Internet, is crucial for exercising this right, including the transparency and openness of the public administration.**

Article 2 of the above-mentioned Law states the following: *"Access to information held by public authorities is based on the principles of free access to information, transparency of government work, the right of the public to know and equality, and is achieved at the level of standards contained in ratified international treaties related to human rights and freedoms, and generally accepted rules of international law".*

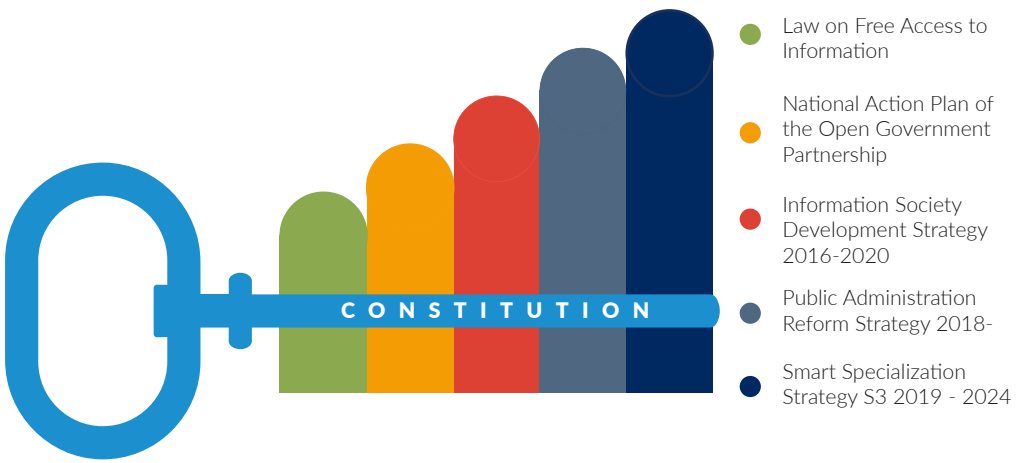


FIGURE 9: LEGAL FRAMEWORK IN MONTENEGRO SCHEME

In order to increase progress in transition processes and increase the transparency of the Government's work, the draft **National Action Plan of the Open Government Partnership Operational Team from 2017,** recognizes the consolidation of all open data in one place. One of the measures defined by this document is the development of an open data portal as a central national open data database. In addition to this activity, there is a necessity to prepare a list of priorities for publishing data, as well as to address the issue of providing instructions for publishing and using open data. All these activities are recognized by the **Information Society Development Strategy 2016-2020** and included in the **Public**

Administration Reform Strategy 2018-2020, and as such represent the basis of the initiative for opening data in Montenegro.

Smart Specialization Strategy S3 2019 – 2024 recognizes the importance of Open Data development process, especially in the part related to the support to creation of e-government and open data service.

Pursuant to Article 12 of the Law on Free Access to Information, it is prescribed which information public authorities are obliged to publish on their websites, including public registers and public records in their possession and within their competences. Also, **Article 12a of the Law on Free Access to Information, which is harmonized with the EU Directive 2013/37 / on the reuse of public sector information, stipulates that public authorities are obliged to publish information for reuse in an open format, with the support of the e-government portal.** A unique and centralized portal and point of access to the authorities is available 24 hours a day seven days a week to all its users. Pursuant to the same article of this Law, the state administration authority is obliged to publish information for reuse together with metadata, in a machine readable and open format, and a manner that enables easy search, in accordance with the open standards.

Montenegro joined the Open Government Partnership on 13 February 2012, when the first Operational Team was formed and the first Action Plan was drafted. At the Partnership Summit held in Brazil in 2012, Montenegro was commended for the activities carried out within its National Action Plan (NAP), in order to improve the communication between the Government and its citizens, and fight corruption.

The European Commission's Progress Reports on Montenegro praised the Government's progress in the area of direct communication with the citizens as well as the citizen participation in public policies. This is mainly due to the services developed by the Government within the OGP process (report abuse) regarding the usage of the official vehicles, involvement of citizens in the fight against the grey economy, e-petition service, etc.

2.2. Current state of readiness of the authority to open data

By analyzing the current data on the state of readiness of the public authorities to open data, it could be noted that the support from the Government of Montenegro in terms of data openness is evident, but it must be stated that it needs to be much more active and even more proactive. The support is mostly reflected in the activities carried out within the **Open Government Partnership project, whose principles are widely accepted by the Montenegrin Government and its apparatus.** The principles of the OGD are reflected in the fact that the Government of Montenegro has formed an Operational Team, whose task is to monitor and implement activities in relation to these principles. The Operational Team was formed in July 2018 and it consists of the Minister of Public Administration, Digital Society and Media, as well as the representatives of the Offices of the Prime Minister of Montenegro and the President of Montenegro. Also, a working group for open data was formed, which includes representatives from 26 organizations, mainly ministries, associations, institutions and universities. It could be concluded that Montenegro has recognized the benefits of OGD and that the relevant institutions have committed to the implementation of their key principles.

Strategic documents and goals, as well as planned activities, recognize the leading role of the Ministry of Public Affairs, Digital Society and Media. The Ministry's contribution is mostly aimed at providing support in identifying and categorizing priorities for publication on the data.gov.me portal, as well as by providing support in connecting sets of information for reuse on the portal..

Many open data initiatives involve converting data that is already publicly available into formats that are reusable, making them a powerful tool for private sector development, allowing for new business opportunities, and developing more efficient governance. On the other hand, in this way, state bodies operate in a more transparent manner – they directly inform and involve the citizens and the economic actors in their activities thus strengthening the relationship and trust between them.

In addition to administrating the portal, the **Ministry of Public Administration, Digital Society and Media has developed the Rulebook for publishing information in an open format**, which includes the instructions for the authorities for publishing data in this format, i.e. the use of the portal. In addition to the datasets of government bodies, this portal is also intended to contain the most interesting applications created using the available datasets (use cases).

In the following period, the authorities need to add new datasets, as well as to enhance their adequate download and use. In the future, the portal www.data.gov.me should become the central place for the datasets of all institutions and sharing of information on the topic of

open data, as well as the setting which provides for communication between the institutions and system users (citizens and businesses entities) without any impediments.

In 2020, Montenegro became a member of the European family of open data, which put it on the map of one of those European countries, including both EU and non-EU, that are providing this data in one place and accessible to everyone. The Ministry is directly involved in support and management.

In the context of establishing a clear mechanism for managing and coordinating the implementation of open data programs, it was of a **great importance to form an inter-ministerial working team consisting of members from state institutions, academia, IT community and the civil sector.** Such a team has significantly contributed to the expansion of the data opening initiative in the past two years.

Thanks to the mentioned initiative, a number of activities have been started that have raised the notion of open data to a significant level, not only of administrative, but also of social capacities. Of the implemented activities, the most significant were certainly the following:

- **Comprehensive training for staff** in state institutions dealing with open data, related to the types of open data formats, preparation of data in an open format, the method of publishing data, etc.
- **Open Data Working Team campaign** for policy makers and government executives to provide them with information on data opening potentials. This was particularly important as improving the work of the public sector should and could gain the broader support of decision-makers and managers.
- **Educational campaign for state administration professionals** on the possibilities the current legal framework already allows / enables by providing clear information on data opening.
- **Public events on the topic of Open Data** in order to promote and raise awareness of the possibilities and opportunities these data allow for. The Chamber of Economy of Montenegro, with nine partner organizations, implements the Project "Open Data for European Open iNnovation" (project acronym ODEON), within "Interreg MED programme", co-financed by the European Union. ODEON project was focused on supporting public institutions to increase the quantity and quality of open data. Also, the project helped set-up intermediary services (Digital Hubs) able to offer tailored support for the exploitation of open data by SMEs and the private sector in general, with innovative services and products.

According to the analysis of available open data on the portal of the Government of Montenegro, as well as desk research conducted through the analysis of portals and websites of public administration institutions, it can be concluded that **the database of existing open data sets is at the basic level.** It is important to continue with more intensive expansion and

further enrichment with new open data sets.

In organizations and institutions that already publish and produce open data, one can notice a very enviable level of knowledge about what open data is, how it is produced and distributed. According to the strategic guidelines, **institutions should also have persons in charge of open data management.** According to the number of institutions that publish open data, we can conclude that the guideline has not been fully implemented as it should be. Possible problem may be there are adequate resources for a systematic approach to the opening of the data, especially when it comes to human resources or trained staff. What would be desirable to improve is the comprehensive information and training of a wider number of people who understand the concept of open data, because it would significantly improve the work on processing and further distribution of this data.

A positive remark which came up as a result of this research, as well as based on the impressions of the interlocutors, is that **currently the minimum requirements in terms of IT infrastructure and the necessary software tools are met,** which is a necessary prerequisite for the production and distribution of open data.

Deficiencies in human resources, however, should not be viewed in isolation, as they have been part of a wider problem faced by almost the entire public administration for years, reflected in the strict constraints of new employment and the underdeveloped vocational training system and insufficiently developed employee training. These problems particularly affect smaller organizational units, institutions and local self-governments, which have relatively smaller number of employees in the administration, and which do not have adequate human, technical and financial resources to perform these activities. All of the above significantly affects the organizational capabilities of some institutions and organizations, which due to pressure and numerous regular obligations and tasks, do not have the capacity for stronger implementation of activities in the field of open data.

It is also a positive notion that several institutions and organizations often publish data for which there is no explicit legal obligation, but they do so within the broader principle of transparency in their work.

Also, **all institutions and organizations have official websites where a lot of data on their work is published, but most of these data do not meet either all or some of the criteria in order to be considered as open data.** This indicates there is a need for additional engagement when it comes to understanding the concept of open data and their reproduction. In fact, **equalization between the concept of access to data and the concept of open data is still present**, which in the future could be a significant barrier to the development of modern concepts of open society.

Published open data sets, which are available for use and further distribution, according to previous experiences, have been developed through planned and coordinated activities of relevant public administration bodies. It is necessary to change this approach in the future

and focus it on a more active role of public administration bodies, especially in the area of publishing new open data sets..

Undoubtedly, and based on the findings from the institutional representatives, it could be concluded that **it is necessary to work on raising the culture of proactive, instead of reactive, data sharing, both within the state administration and with the general public.**

2.2.1. Advantages of the current situation

The public administration reform strategy includes **processes aimed at digitization and reduction of bureaucratic barriers**, and in that sense, one could expect the establishment of active participation of citizens in the formulation and implementation of public policies. These processes are one of the essential segments of the development of efficient and effective public administration, but also one of the key assumptions of government's transparency.

The Government of Montenegro adopted the Public Administration Reform (PAR) Strategy 2016-2020. The main goal of this PAR Strategy is to create efficient, professional, and service oriented public administration serving the needs of all the citizens and other social and business entities. At the same time, the PAR Strategy is an important response to the requirements related to process of accession of Montenegro to the EU. Its implementation should ensure consistency and improvement of public administration system, increase of the quality of laws and other regulations and strategic documents, improvement of administrative procedures, but also the improvement of transparency and accountability of public administration, which is particularly contributed to through open data.

Regarding the political coordination of reform processes, the Public Administration Reform Strategy 2016-2020 defines the establishment of the **Public Administration Reform Council.** The council was officially established on December 29 2016. Its work is managed by the Deputy Prime Minister and it is composed of the representatives of key institutions and organizations for the implementation of the public administration reform, including the Chamber of Economy of Montenegro. .

The establishment of this advisory body is necessary, specially having in mind the scope and importance of public administration reform in the coming period, as well as the fact that its work will be focused on activities carried out by public administration bodies in order to achieve PAR principles, which represent the basis of this strategic document.

The key task of the aforementioned Council is to monitor **the implementation of the Public Administration Strategy 2016-2020 and the Action Plan**, but also perform other activities related to PAR in Montenegro (consideration of draft regulations, strategic, planning and analytical documents related to public administration reform, etc.). Professional and administrative support to the work of the Public Administration Reform Council is provided by the Ministry of Public Administration, Digital Society and Media.

The recent elections held in Montenegro (August 2020) also resulted in certain personnel changes in the public administration. The new administration has expressed its readiness to thoroughly and dedicatedly focus on the application of European standards and norms,

[8] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32019L1024&from=EN

so it is to be expected that such an attitude will be applied to the development of a policy that affirms open data. This orientation is especially important if we consider the negotiation process for EU membership, and it can be expected that the announced reforms and processes further improve the production and distribution of open datasets.

Furthermore, it was announced that there will be further intensification of policies and activities aimed at digitalization of the entire society, openness in the creation, adoption and implementation of various policies, all with the aim of strengthening the principles of transparency and openness.

It is also an encouraging fact and a well-followed trend when it comes to government institutions in terms of **publishing data in a digital format**. This creates a good basis when it comes to fulfilling the conditions that need to be met in order for open data to be published.

In recent years, there has been a **slight rise in the trend in terms of the demand for open data by community actors**, which representatives of the NGO sector are committed to the most (for various, and most often socio-political reasons) as well as the representatives of the business community.

The **use of** the **Creative Commons CC BY licensing is clearly indicated on the open data portal**, managed by the Ministry of Public Administration, Digital Society and Media. By downloading the available data, users are obliged to indicate the date of download, the date from which the data could be downloaded, and provide a clear indication of each reuse in an appropriate manner, instructions on the data source, including the name of the public authority that made the data available through this portal. This is a very positive step in the further development and usability of the portal, but also in terms of the creation of new sets of open data and their further distribution.

2.2.2. Disadvantages of the current situation

Considering the fact that the Government of Montenegro launched the open data portal in July 2018, which generates the available open data of the entire public administration, **there is still no representative example that could speak about the efficiency of using this type of data**. What needs to be done in the next period concerns the greater degree of valorization of this portal, because it gives the impression that **its existence has not yet come to life in the right and valid way.**

The **work of the open data portal is not accompanied by adequate work plans and their dynamics, which would indicate a strategic development approach.** It is also necessary that such plans be developed and / or improved in institutions that are already publishing, should publish or are planning to start publishing open data. For all the above listed, a systematic, short-term, mid-term and long-term

plan for the development of the open data portal is necessary, which would be harmonized and done in accordance with the organizations and institutions of the entire system.

When it comes to the present sets of open data, they are exclusively related to the state (national) level, and it is not difficult to notice **that there are no data related to lower (local) level**. This is a very worrying fact, which does not support the further affirmation of the production and distribution of open data, and at the same time speaks of the fact that local governments do not actively participate in the development of the concept based on the use of open data. Further issues of this type will be discussed in the following chapters of this analysis.

Numerous **strategic documents and action plans are in the final stages of implementation or are about to expire.** The fact that the work on new strategic documents has not begun, or that there are no adequate steps taken that would lead to new strategic documents and action plans in the near future, is a serious concern.

Also, **the current COVID-19 crisis can significantly impede further development and functionality when it comes to open data**, shifting the focus of many administrative activities from "regular" or "planned" jobs to those focused on mitigating the existing critical situation.

Of the numerous **regulatory agencies, most of them do not distribute data in the form of open data, which means that only two state agencies so far have published three sets of open data on the portal.** This is an unsettling fact, given that most agencies in Montenegro publish a significant amount of data, in an electronic form, which could easily be transferred to open data. The data contained in the regulatory agencies are of great importance particularly for the business and investment sector, as well as for numerous analytical and planning activities, and therefore more attention should be paid to these institutions and the data they collect.

Existing **open data guidelines should be further reinforced with instructions for their use and reuse**. If we talk about the number of available open data sets, it is obvious that these guidelines have not been used enough, when it comes to organizations and institutions that deal with or should deal with issues related to the production and distribution of open data. In this regard, it would be desirable to intensify activities to acquaint as many users as possible with the existing and new instructions, which can affirm new production and reuse of open data.

Despite the fact that a number of activities have been done so far that have shown

that within the system there are people whose knowledge and skills equipped them to effectively and efficiently respond to the challenge of establishing open data, there is no doubt that the **number of trained people, especially those that have the necessary level of ICT knowledge, is extremely limited.** This piece of data is especially important if we take into account the rationalization of the state administration, as well as numerous restrictions that are imposed systematically from time to time related to the new employment.

Numerous data published on the portals and websites of institutions and organizations are in the electronic form, however a **significant number of them** unfortunately **do not meet the necessary criteria to be classified as open data.** This also indicates that it is essential to further strengthen, not only human capacities,

2.3. ODEON project

The Chamber of Economy of Montenegro implemented project ODEON (Open Data for European Open Innovations) from 1st of February to 31st of December 2020. This project was financed by the European Union through the Interreg MED Program, and was implemented together with nine other partners from eight European countries.

Partners on the project are:

- Veneto Region (IT)
- Chamber of Economy of Montenegro (CG)
- Croatian Agency for SMEs, Innovation and Investment (HR)
- Technology Park Ljubljana (SLO)
- GFOSS - Greek Open Software Company (GR)
- SARGA - Government of Aragon (ES)
- Agency for Sustainable Cities and Territories of the Mediterranean (FRA)
- Chamber of Commerce of Padova (IT)
- Knowledge Innovation Market Foundation (ES)
- Region of Crete - Directorate for Environment and Spatial Planning (GR)

The aim of the project is to support the growth of clusters and SMEs with an emphasis on green and blue growth through the use of available open and large data. ODEON is aimed at establishing intermediary bodies that will be able to support SMEs in the use of open public data in the area of innovative services and products, and thus the creation of a new

data-based management model, in line with the digital single market strategy. The project provides an opportunity and enables private companies to stimulate work on applications and services by making the best use of open data while listening to the market and focusing on its needs. This data should be of special importance for SMEs, researchers, but also for citizens, and public institutions should serve as providers of information that enable the development of specific territories.

The Ministry of Public Administration of the Government of Montenegro was an associated partner of the Chamber of Economy in this project, whereas through synergetic activities all project activities that were planned were also realized very successfully. The quality of the realized events, the promotion of the project and cooperation with other project partners, as well as the connection with other initiatives related to this topic, were praised by the lead partner.

The Chamber of Economy of Montenegro, with the support of the Ministry, realized 17 seminars, and two hackathons.

The promotion of the project during its entire duration through all channels of communication, including an extensive media presence, was also implemented and completed successfully and with a lot of dedication throughout the entire duration of the project. Various events have been organized to mark the Open Data Week. An online study visit on the topic of open data was realized, in cooperation with partners from Italy, Slovenia and Croatia, as well as the final event at which the achieved results were summarized.

In accordance with the project goals, a hackathon was organized in October 2019, in the outskirts of INFOFEST, with the participation of six teams and 28 members. The success of the activities of this project, with an emphasis on the hackathon, was also recognized in the OECD annual report. Also, the Chamber participated in the first Climathon that was organized in Montenegro. On this occasion, open data in the field of environmental protection and waste management were promoted among the participants in order to ensure their usage in the development of ICT solutions which address the most pressing societal issues.

A national data center has been established, which has 53 representatives of public administration, industry, scientific community and civil society. A particularly important activity is the Open Data Caravan, during which representatives of the Chamber's ODEON

2.4. Montenegro Open Data Portal - Situational Analysis

The national open data portal is a central place where open data of state institutions are consolidated in order to be available for use and further processing by citizens, private and non-governmental sector. **The number of state institutions and information available on the Portal has grown since its establishment**, but it could be said that it is not as fast and dynamic as it should be. Thanks to the number, structure and degree of openness of the data available on the portal, **Montenegro is at the 49th place on the list of all members of the United Nations when it comes to the Global Open Data Index**, and in fifth place when it comes to the countries of the region. Ahead of Montenegro are Slovenia, Serbia, Croatia and Albania, while North Macedonia and Bosnia and Herzegovina are lagging behind it.

The importance of open data is multiple, because they operate on several levels, and, above all, because they stimulate economic growth, make public administration more efficient, allow for a better use of human and other resources, provide better services to citizens, ensure transparency and reduce the scope for corruption.

Published data on the portal from dozens of public institutions, which have opened a total of about a hundred datasets with hundreds of resources (files), is a very important advantage when it comes to the open data society development in Montenegro.

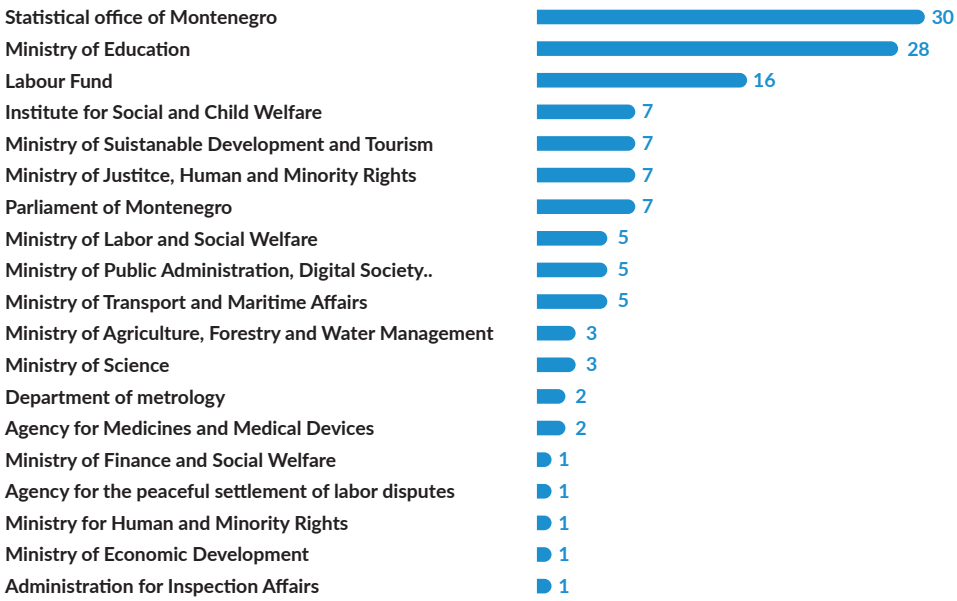
The opening of data is a strategic commitment of the Government of Montenegro, reflected in the Action Plan for the implementation of the international initiative Open Government Partnership, and it concerns the achievement of basic standards and principles of OGD.

Institutionally, the data opening process is managed by the Ministry of Public Administration, Digital Society and Media, which is in charge for maintenance and administration of the national open data portal, and as such is the first point of inquiry for all public and private entities wishing to publish data.

So far, 19 institutions, organizations and agencies published 132 datasets on the national open data portal.

[15] Poslednja objavljena analiza za 2016. godinu - https://indek.okfn.org/place/me/

The variety of institutions and the number of datasets they published up to this day is shown in the following table:



GRAPH 2: OPEN DATA PORTAL – ORGANIZATIONS STRUCTURE

The most represented institution, quite expectedly, is the national statistical office MONSTAT, which publishes 30 datasets groups on the portal. The largest number of datasets refers to poverty and living conditions - 12 datasets, followed by data related to basic living conditions statistics - 7 datasets, GDP - 5 datasets, and the other 6 datasets related to migration and basic statistical indicators.

As much as it is logical that MONSTAT is the institution with the biggest number of datasets available on the open data portal, it is surprising that there are not many more of these datasets. This conclusion is made precisely because of the factual situation regarding the collection and processing of data, which certainly enable MONSTAT to transform a significant number of data and their sets very quickly and efficiently into open data format.

The Ministry of Education is in the second place with 28 datasets in which it presents details on the number of children enrolled in preschool and school in Montenegro. In addition to the abovementioned, there are data on the number of students in primary schools - total by school, gender, language of instruction and type of ownership of the educational institution. It is important to note that the ***Ministry of Education has been continuously publishing these data since the very beginning of the work of the open data portal, starting from 2018.***

[16] https://data.gov.me/domeni_podataka/index.php#

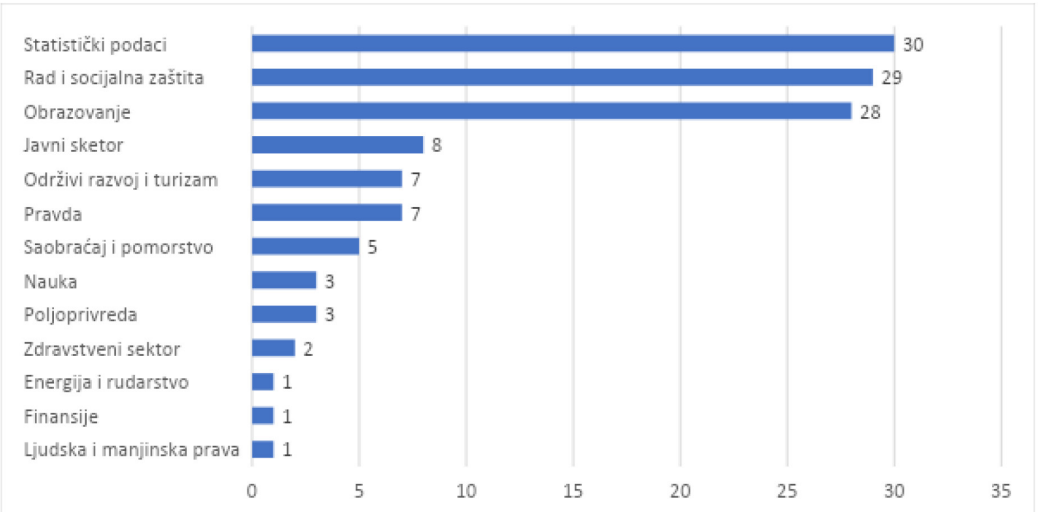
2.5. Priority domains and datasets

When we talk about the existing data present on the open data portal, it is important to point out that this number is growing at a slower pace. However, it is evident that the number of available datasets is not growing fast enough and in a dynamic way, especially when it comes to data concerning the local level.

The most common data on the portal are those in the domains of statistics, labor and social welfare, and education; 30, 29 and 28, respectively.

On the other hand, **the least represented data sets are in the field of finance, energy and mining, and human rights**; only one data set available from each. This number of data sets can be a big problem, but also a chance for further development of the concept of using open data.

The Open Data Portal in Montenegro uses the API method, due to its accessibility and systematic approach. What should be considered in the coming period, particularly regarding the opening of new data sets, is the use of the "bulk" method too.



GRAPH 3: OPEN DATA PORTAL MONTENEGRO – DATASETS

Taking into account the reasons why open data are used, **it is necessary to further improve the data structure and the topics they cover**. In this regard, there is no doubt that the number of data and data sets in the field of finance and budget spending must be significantly more present in the form of open data.

Data concerning the public sector, justice and sustainable development and tourism are in a slightly better position, but still insufficient to conclude that various social factors have a good basis for analysis and timely and quality decision-making.

The conclusion that could be drawn from this analysis is simple - **the largest number of types of data sets are in fact classical statistical data, which, due to their method of collection and further processing, could be converted into open data sets in the easiest way.**

2.6. Priority domains and datasets to be opened

Open data is publicly accessible knowledge for anyone to use. In terms of business, this data can be used for predictive intelligence and forecasting, unveiling buying patterns of demographic groups, finding new opportunities for innovation, and so much more.

In addition, **the production, distribution and reuse of open data significantly affect the openness of society, the degree of its democracy, the reduction of corrupt practices and, in general, the strengthening of all instruments of the rule of law.**

Taking into account the initiated processes aimed at affirming the creation and distribution of open data on the one hand, as well as the expectations of the society in general, it is necessary to strengthen the database of databases, which are available through open data.

What interests the users of this data the most are certainly financial and budgetary information, data on public health as well as a certain set of cadastral data. Without excluding global trends, as well as individual experiences in the development of the OGD concept, **the introduction and / or expansion of the following data groups is highly recommended:**

I. **Financial data** Information on GDP rates, informative logistics, energy consumption, disbursement and management of funds, data on trade, foreign trade balance, mutual exchange, local production, etc.

II. **Business entities** Register of economic entities, including the lists of registered economic entities, ownership and data on the management structure, registration identification marks, balance sheet, etc.

III. **Statistics** National, regional and local statistics with main demographic and economic indicators including GDP, age, health, unemployment, income, education, etc.

IV. **Health and scientific data** One of the most complete open data repositories for global mortality rates, disease outbreaks, mental illnesses, health financing, and more. The importance of open data and the adequacy of statistical analyses are perhaps best illustrated by the COVID-19 pandemic, which indicates numerous difficulties in the implementation of certain strategies and activities due to the lack of adequate data.

V. **Environment** Spatial and in-city data including weather monitoring, soil and water

quality, energy consumption, emission levels, etc.

VI. **Academic data** Data on the number of researchers, patents, licenses, scientific research projects, funds approved for the promotion of science and research, as well as the data on the number of realized and commercialized projects.

VII. **Traffic data** Public transport timetables for all types of transport at national, regional and local distances, road works, traffic information, etc.

VIII. **Geospatial data** Postal codes, national and local maps including cadastral plans, topographic maps, nautical maps, administrative borders, etc.

The development of market economy and competitiveness is directly related to the degree of innovation. In this regard, there is a trend in developed countries of today that many entrepreneurs and innovators base their detailed analyses and research, for the sake of starting a business and conquering the market, on the available open data.

Given that starting a business requires numerous analyses, testing and trials to be done, which are very often quite expensive, today's entrepreneurs are very happy and eager to be provided with and rely on open data and their use.

1. **Delivering a personal touch.** Use of open data to connect more directly with the needs and desires of consumer base can be very productive. Predictive data could reveal buying habits so that the entrepreneur could deliver a product or service in a way that makes customers feel like individuals rather than members of a herd. The data could also be used to cross or upsell customers, as Amazon does when it makes friendly suggestions based on consumers' previous buying behavior.
2. **Solving problems.** A lack of information could impede efficiency and, in turn, raise costs and limit growth. However, integrating data from the vast open network, could make an industry less resistant to progress. Whatever a start-up's mission is, the opportunities open data provide could be bountiful.
3. **Creating benchmarking solutions.** Is a company operating as efficiently as possible? Data collection could help the evaluation of internal processes and productivity. Start-ups tend to get stuck in cycles of selling and speeding toward making a profit. It could be difficult to hit the pause button or deviate from the daily grind, but it is important to make data analysis a habit so the company could operate and grow intelligently.
4. **Expanding offerings.** Carefully selected data is not just a valuable resource for primary business objective. Entrepreneurs could also use it to generate a secondary strand for their business.
5. **Informing new product ideas.** Free government data could also serve as the impetus or foundation for new products or services. Selected data could provide

the perfect insight into consumer problem areas so the one using these data could create tailored solutions. For example, Fluid has developed a personalized shopping app, using data such as product information, consumer sales history and user reviews to offer shoppers customized advice as they browse.

Some solution vendors targeting larger businesses probably do not understand the needs of small companies. Enterprise-software-solution vendors like to tout economies of scale, whereby a huge up-front investment is offset when an application is rolled out to thousands of internal users.

This is meaningless to the owners of small businesses who are focused on simply finding the right tool for the right users quickly so as to accomplish more work which is at the same

3. LEVEL OF SOCIO-ECONOMIC IMPACT OF OPEN DATA, WHICH CAN BE EXPECTED IN MONTENEGRO

One of the most used terms related to data is that data, that is, information, is the only resource that increases its value by further sharing. This is actually a concept of multiplying the value of one of the most important resources of today.

Open data is a social good - It empowers citizens relative to organizations and governments and enables them to take an active part in the society. This allows citizens, journalists and others to hold organizations and governments accountable..

In Western democracies, an argument often used is that open data will improve public services. This is frequently called the "open data auditor". If we look into this argument more carefully, it tells us that open data is simply the most useful sort of data.

Open data is good for the economy - It makes it easier to start viable businesses and promotes innovation and new approaches. Innovation is seen as a result of both new perspectives on existing data and of linking different, often disparate, datasets. In the case of governments, the citizens are already the owners of the data and should be able to freely access it. So, logically, when we look at social impacts, we would expect to see benefits in at least one of those areas.

If we take into account the experiences from Europe and around the world, but also a general comparison with the data available on the Montenegrin open data portal, we draw an undoubted conclusion about the need to develop the following categories of data sets:

IT and geospatial

This dataset includes data on infrastructure, software applications, data analytics and visualizations for a wide range of users. The most used types of data include geospatial, environmental, demographic and social. Open geographical and satellite data helps strategists both within and outside of government for land and resource management and planning. Many data analyses and visualizations use geospatial and mapping data to provide geospatial intelligence, and many organizations focus exclusively on this type of data. They also focus on identifying geographical patterns, providing map-based interfaces for their customers, and predictive modelling.

The main user groups of this data sets are: developer groups, micro, small and medium enterprises and the NGO sector. The data could be used for: development of products/services, organizational optimization, advocacy and research, respectively.

Governance

These are primarily used by non-profits that need open data to monitor budgets, evaluate performance, and conduct issue-based advocacy. The most used types open data include government operations, legal, health, demographic and social data. Open data is also a critical tool for issue-based advocacy and citizen engagement. For example, organizations use spending and performance information on health or education to reveal and deter corruption that can keep institutions from getting the funds they are entitled to.

The main user groups of this data sets are the developer groups and the NGO sector. The data could be used for: advocacy, development of products/services, organizational optimization and research, respectively.

Business, research and consulting

Open data has become a significant resource in this sector, supplementing business intelligence, market and economic research, and consulting services. The most used types of open data include economic, demographic and social, as well as legal data. Many organizations use open data to provide financial, economic, industry or legal data and intelligence. These organizations facilitate access to this information, as well as develop visualizations and additional analysis for their clients. They help companies manage risks, identify market and investment opportunities, conduct trend and predictive analysis, and develop forecasts to support their clients' decision-making. Those that provide legal intelligence use intellectual property data such as patents and trademarks to attorneys, researchers, and inventors, while others collect, code and publish up-to-date statutory and regulatory legal information.

The main user groups of this data sets are the commercial entities and the NGO sector. Data can be used for: organizational optimization, development of products/services, research and advocacy.

Energy and climate

Open data is being used in this sector for environmental and energy use monitoring, to guide decisions on where and how to invest in energy infrastructure, and in order to identify the ways to assess the impact of climate change. Environment, energy, and weather data are the ones most widely used here. While renewable energy resources are being developed, open data is helping utilities providers and consumers manage existing power sources more efficiently. Consumption data is being used to estimate energy use patterns and increase efficiency in the industrial and buildings sector. Non-profits are also using open data for environmental monitoring and impact assessment. They use local environmental and ecological information, as well as demographic and social data, in order to measure air and water pollution and energy usage and predict the impact of shifts in climatic conditions. They incorporate open data in their research and advocacy work to publish data, analysis, and recommendations.

The main user groups of this datasets are the commercial entities and the NGO sector. Data can be used for: organizational optimization, development of products/services, research and advocacy.

Finance and insurance

Open data being used in this sector is to guide investments and trading, increase access to capital and insurance, and evaluate risk. The most used data includes financial, business, and economic information, as well as demographic and social data. Open data also help guide investments for economic, as well as social benefit. Economic statistics are a bedrock of financial analysis, and many organizations also rely on company registers, consumer price indices, satellite imagery, and sector-specific government data to inform their investments in companies, real estate, currencies, commodities, and other assets.

The main user groups of these data sets are the commercial entities and the NGO sector. The data could be used for: organizational optimization, development of products/services, research and advocacy.

Healthcare

Open data has fueled major advances for improved health outcomes, ranging from increased access to care to informing medical research. Organizations in this sector rely on open health, geospatial, demographic and social, as well as scientific research data. Open data is used also to evaluate health outcomes, develop more effective treatments, and predict disease outbreaks. For instance, researchers use health data, demographic and social statistics, environmental and geospatial data, and more, to conduct epidemiological studies, predict and monitor disease outbreaks, and target responses.

The main user groups of these data sets are the commercial entities and the NGO sector. The data could be used for: organizational optimization, development of products/services, research and advocacy.

3.1. Open data: a driver of growth, innovation and jobs

The global momentum around open data is real and expanding as most of the countries around the globe are becoming more and more aware of their potential as drivers of innovation, competitiveness and enhanced services. Open data offers “raw materials” for business innovation and job creation in the applied economy.

Within the OGD initiative, Montenegro has launched activities aimed at improving the social environment, with a special focus on improving the conditions for business entities and the setting which they operate in. In this regard, several activities are underway, aimed at more efficient management of public resources. Among them, we shall address the following, which are deemed as most important:

- Establishment of the National System for Collection of Administrative Fees;
- Establishment of an electronic access to the database of the Decision on Real Estate Tax for the current year

Several activities are also underway in order to improve the public environment through the following:

- Visualization of the national and local self-governments' budgets
- Development of a brochure "Budget for Citizens"
- Development of a comparative analysis / study on whistle-blower protection "Whistler cases"

Assessing the value of open data requires inputs and continuous feedback from all relevant stakeholders and users. Power and the capacity of open data is complex and multi-layered, related exclusively to one imperative, and that is – the ultimate end beneficiary of open data is expected to be the entire society.

For a country such as Montenegro, where the influence of open data is still not very evident, it is very important to point out the potentials and possibilities of production and distribution of open data.

The attractiveness of open data lies in their unpredictability usage, i.e. their usage and final implications. It is not possible to predict in advance the purpose for which certain data could be used or to identify all the problems that can be solved in this way.

Only through the creative use of open data, often combined with other data, can their full potential be realized and recognized, in terms of solving important social problems or creating new economic value.

It is for this reason that open data is proactively shared online and users are encouraged to use it proactively. Open data in urban areas can make a significant contribution to a better perception of urban problems and better urban management systems, thus improving the quality of life of citizens and the business environment overall.

By creating applications, developers participate in creating economic chances, but also new financial and social values. For example, if the app makes public transportation more efficient and compelling to users, it has also contributed to more people actively using public transport, which means that it has contributed to the creation of more social values.

Open data is used by a large number of new companies, the so-called start-ups, and this process has in turn accelerated the creation of new jobs. Through the organization of public events, such as hackathon, it is possible to generate many ideas and application solutions that could improve a particular segment, procedure or activity. Such events are a good basis for launching entrepreneurial ideas, which target the solution of specific problems identified by the different factors of the social community. On the other hand, the availability of open data stimulates entrepreneurial ideas, through the creation of the above-mentioned solutions.

For the Government of Montenegro, open data can encourage growth in several ways, namely:

(1) **Stimulating skills development and accelerating job creation, especially in the service sector, leading to new jobs, investments and tax revenue.** *In the US, open weather data has led to 400 new value-added businesses in the services sector.*

In 2020, a set of innovation laws (Law on innovation activities Official Gazette of Montenegro, 82/20 and Law on incentives for research and innovation development, Official Gazette of Montenegro, 82/20) were adopted in Montenegro. These laws introduced special benefits for individuals and companies working on the development of innovative solutions. This proves to be a very good chance to improve innovative activities of all economic actors, research institutions and individuals who could, with adequate sets of open data, develop and bring to life quality and competitive solutions.

(2) **By changing the paradigm of service delivery and empowering businesses, civil society and individuals to co-create and deliver services.** *In the UK, FixMyStreet21 has created a new street maintenance channel by public agencies, leading to 200,000 registrations and repairs to 65,000 potholes.*

With the arrival of the COVID-19 crisis in Montenegro, a number of solutions were applied in order to mitigate the economic and social consequences. In this regard, numerous digital solutions have been created through various activities, such as hackathons, competitions and alike. It has been unequivocally shown that one of the most common barriers to the commercialization of many of the proposed solutions has actually been the fact that there is a significant degree of data unavailability.

(3) **Transformation of the entire economy in specific sectors.** *For example, the governments of the United States, the United Kingdom, and Taiwan make open health data available to encourage the advancement of healthcare services and pharmaceutical innovation. This creates a completely new ecosystem of services, skills, businesses and jobs that also lead to real improvements in the healthcare sector.*

Improving healthcare and its absolute availability are the primary goals of any democratic society. Montenegro, as well as other countries of the world, in the fight against the COVID-19 pandemic, has made a significant progress in building e-health infrastructure as a system that should provide all its citizens with adequate and the best possible healthcare in a timely and efficient manner. In addition to that, some other countries, such as Israel, Germany and neighboring Serbia, have found a way to use open data and develop numerous applications in order to effectively implement measures in the fight against COVID-19 or have managed to organize activities on collective immunization.

(4) **Encouraging New Company Creation** - Open data drives growth by stimulating the creation of companies that reuse freely available government information in innovative ways. *In Spain, a study estimates that there are over 150 companies focused*

solely on the infomediary sector.

In 2020, an initiative was launched by IT companies in Montenegro, which should result in the creation of ICT clusters. The assumptions are that this cluster can meet the most rigorous criteria for entering a larger foreign market, than those in which it currently performs.

(5) Creating New Products and Services – Micro, small and medium sized companies with products and services based on open data, such as Global Positioning Systems (GPS), financial services and software applications, also generate new businesses and jobs.

4. PRACTICAL APPROACH

4.1. Open Data identifies prescription savings – case of England

In 2011-12, the NHS in England spent more than £400m on statins, a class of drugs used to prevent cardiovascular problems, out of a total drug budget of £12.7 billion. Some of these drugs are more expensive than others: patented ones can cost 20 times more than generic versions.

The current evidence shows that all drugs from this class are equally safe and effective, so doctors are usually advised to use the generic versions initially. With the aim of analyzing the prescription pattern of these drugs - Mastodon C, a big data start-up company incubated at the Open Data Institute and Open Health care UK (a consortium of NHS doctors and technologists dedicated to improving patient care by opening up health data), worked with publicly available NHS prescription data. They looked at the entire prescription dataset (over 37 million rows of data) and analyzed how much money was spent in each area on more expensive drugs. It was found that on an average £27m a month of potentially unnecessary expenditure on the two proprietary statins took place in 2011 in the NHS in England. And savings of over £200m could have been achieved for the NHS, had every doctor prescribed cheap statins.

Encouraged by the findings, the team intends to go further ahead and identify similar potential savings in different prescription categories as well.

4.2. Open data in the function of e-health development - Case of Serbia

One segment of the development of e-government in Serbia is the development of e-business in the regulation of medicines and medical devices (medicines regulation). Without e-business in medicines regulation, it is unthinkable to develop e-health and e-pharmacy.

The integration of e-government and e-pharmacy implies the application of the G2B model of e-business between the Agency for Medicines and Medical Devices of Serbia (ALIMS), as a public agency of the Republic of Serbia (RS) on the one side and the pharmaceutical industry and pharmacies on the other. In the regulation of medicines, e-business is used for collecting, recording, storing and providing data, and information about medicines is a source of necessary information for the daily work of doctors, pharmacists and other health professionals.

The development of e-business in drug regulation, as one segment of e-government in Serbia, provides interactive electronic services tailored to the needs of citizens, government agencies, regulatory and educational institutions and the economy (manufacturers, representative offices, importers, drug and medical devices, health and pharmacy institutions).

In order to ensure greater efficiency in doing business with clients, but above all faster and better availability of new medicines to patients and health professionals in Serbia, the Agency for medicines and Medical Devices of Serbia (ALIMS) has launched a comprehensive action plan to improve e-business and data transparency, both to citizens and to health organizations and the pharmaceutical industry in 2016. ALIMS launched a major project that will enable its integration and the pharmaceutical industry by opening data sets related to the register of medicines in human medicine, the register of medicines in veterinary medicine, the register of medical devices and generic names of medical devices, register of approved clinical trials, register of certificates of medicines in human and veterinary medicine that have been laboratory tested, register of import licenses for medicines and medical devices.

ALIMS was among the first to adopt the concept of "open data" and thus contribute to the realization of benefits for the economy in general, businesses, government agencies, the scientific community and other segments of society in the Republic of Serbia.

Based on open data sets for medicines for human, veterinary medicine and medical devices, some web applications have already been developed, as well as mobile applications, as follows:

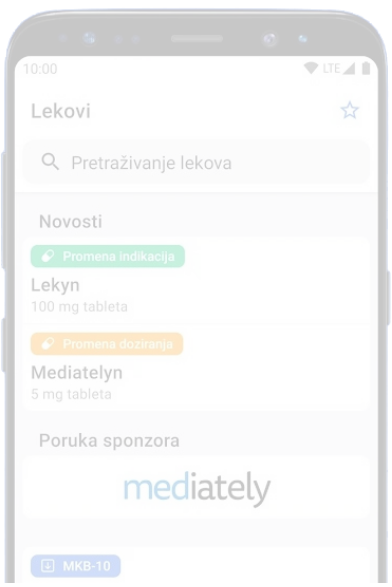
Android and iOS applications with fresh information and all data on registered drugs in Serbia "Mediately Drug Database ", Which allows you to search for a registered drug, its dosage and price (available at the link: https://mediately.co/rs);

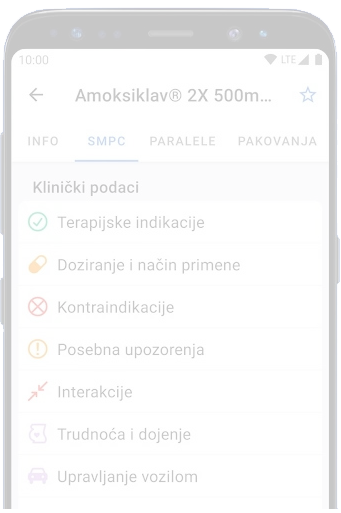
Android application "Find a Cure" which allows you to find the nearest pharmacy that has a specific drug with a display of the price of a given drug. The application also uses data sets of other institutions such as the Republic Health Insurance Institute and the Ministry of Trade and Telecommunications of Serbia, as well as data related to data sets on pharmacies of the Ministry of Health.

Web application "Trafficking in drugs and medical devices" which allows the institutions of the pharmaceutical industry to use data sets on registered drugs and the choice of a particular drug by keyword, to send data on the turnover of drugs and medical devices.

ALIMS fulfils its mission – promotion of human and animal health, as well as contribution to the realization of the basic human right to access quality, safe and effective medicines and medical devices.

The development of e-Business in the regulation of medicines, as a subsystem of eGovernment of the Republic of Serbia, provides a unique environment for communication, better information on medicines, education via the Internet for health workers and citizens, as well as more efficient business in health and pharmacy segment of drug regulation.





CONCLUSION AND RECOMMENDATIONS

Based on research and findings presented in this analysis, we can undoubtedly conclude that **Montenegro is committed to open data becoming the backbone of its overall growth and development.** So far, the activities have given a significant impetus to the implementation of the principles of OGD, which ranks Montenegro among the countries of practical strategic commitment to this task.

The development of the legal infrastructure has begun, which has largely given stimulus and a necessary push to institutions and organizations for the development and distribution of open data. In this regard, the relevant body i.e. the Ministry of Public Administration, Digital Society and Media, has taken over the role of coordinator of these activities and, as the most important project, has launched an open data portal, which is also ranked on the European Open Data Portal.

As a result of the activities implemented so far, **Montenegro holds 49th position in the Global Open Data Index**, which makes it the third most successful country in the Western Balkans when it comes to this area. However, **it is noticeable that the notion of open data has not yet taken root among all relevant stakeholders**, and it could be concluded that it is necessary to intensify activities aimed at introducing all factors of society to this concept.

It is particularly encouraging that most institutions and organizations have a significant degree of openness and willingness to publish and disseminate a wealth of data, but the knowledge and capacity to make this data open is lacking. Furthermore, a significant number of data sets still need to be developed, improved and made available.

It is necessary to continue with the started activities related to raising awareness of the concept of open data, especially with institutions and authorities, which are the generators and the potential distributors of this type of data. It could be noticed that there is an interest in this type of data by the wider community as well, but this interest is still of insufficient intensity. This means that the strategic and planned action and activities must be much stronger and intensive. **Montenegro, on the way to the adoption of the European principles, norms and values, is moving towards the creation of the most modern standards. The adoption of the principles and policy of open data is only one of these segments.** The process that has begun will certainly evolve, the only question left is how comprehensive and fast will it be.

Recommendations for the next steps to be taken:

1. ***Focus on impact and public values rather than input when creating open data related policies in Montenegro***

   Data-publishing public institutions could learn by developing their open data policies from the viewpoint of what the impact and resulting public values should be and how the government should be transformed in order to be able to achieve this. Although effects of open data policies cannot always be predicted, concentrating on the desired effects of policies that are proposed and adopted could help to develop and improve them and to avoid the squandering of scarce resources.

2. ***Stimulate the use of open data and communicate successes from Montenegro, the Western Balkans region, Europe and the world***

   Stimulating the use of open data should be part of open data policies, as this is an important factor in creating the intended effects. Policies can include the principle that open data usage practices are shared and disseminated to show the policies' relevance and possible impacts. These practices should be used as motivational examples by distributing them within as well as outside the government, in order to help to overcome resistance against publicizing data.

3. ***Create a culture in which opening data is incorporated in daily working processes of all institutions, organizations and companies in Montenegro***

   To implement open data policies and to achieve goals such as economic growth, innovation and transparency, the culture of open data policies has to change from a culture in which opening data to the public is an exception, towards a culture in which the opening of data is standardly considered. Ideally, a culture of openness exists in which the open data policy is part of all working processes and, if there are no barriers, data is automatically publicized without the need for lengthy discussions.

4. ***Open data stakeholder and dataset mapping in Montenegro***

   This activity includes mapping public institutions and companies on national and local level, as well as private institutions who are generators of open data, and potential data sets which could be provided to the public. Stakeholder and dataset mapping should be jointly developed by the public and private sector, meaning those who generate open data and those who are most likely to use them in developing concrete ideas and solutions.

5. ***Development of the Open Data Strategy for Montenegro***

   The strategy should be based on the development potential of publishing and distributing open data, with the aim of further improving this specific topic.

   It would be desirable for the Strategy to focus on the topics that are of the greatest importance, when it comes to numerous processes and activities, which are defined by other strategic frameworks and plans. Some of the scopes that the Strategy

should focus on are:

- expanding the number of institutions and organizations actively involved in the Open Data Initiative;
- expand the scope, quality, quantity and scope of open data sets available on the data.gov.me portal;
- providing a framework for support and training to public administration organizations in their activities aimed at publishing open data.

6. Communication and outreach toward general public in Montenegro

Following up on making government information legally and technically open and reusable, the next step is to encourage others to make use of the available open data through strategic and planned communication. This includes engaging with the data community and the general public through direct communication and digital outreach, conveying the right messages, promoting the meaning of the term of open data as well as the benefits of their use, and sharing the experiences of others.

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STUDY ON IMPLEMENTATION OF OPEN DATA CONCEPT BY MONTENEGRIN INSTITUTIONS

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