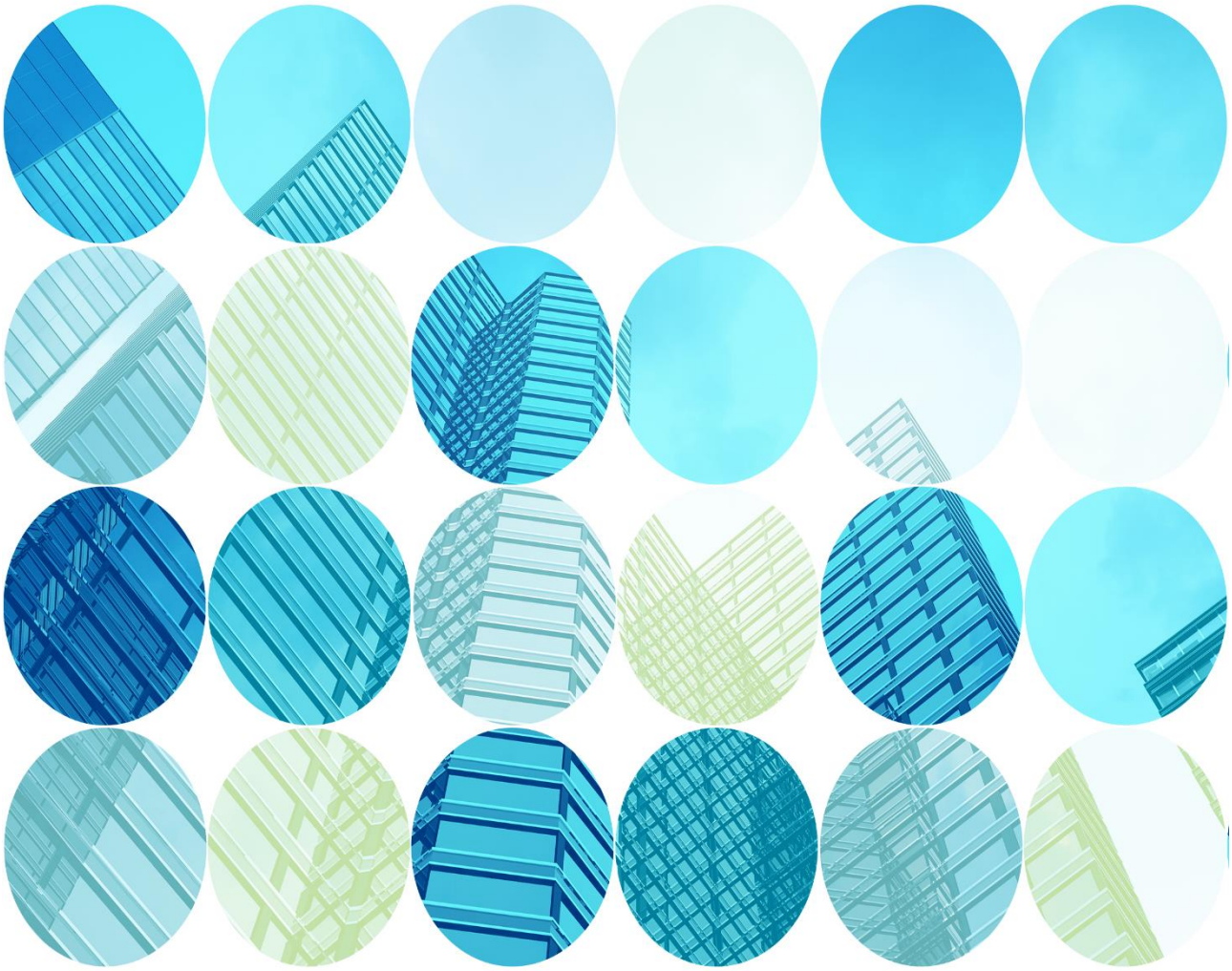
Ministry of Public Administration,
Digital Society and Media

MONTENEGRO DIGITAL TRANSFORMATION STRATEGY 2022-2026

WITH ACTION PLAN 2022-2023



DECEMBER 2021

INTRODUCTORY WORD BY THE PRIME MINISTER

Prof. Zdravko Krivokapić, PhD
Prime Minister

The fundamental commitment of the Government of Montenegro is a smart, sustainable and inclusive approach, and in order to realise this in practice, digital transformation, one of the main pillars of this Government, is necessary. Digital transformation is a necessary precondition for further development of Montenegro in all areas of public administration and society and the backbone of economic growth.

The corona virus pandemic has imposed not only the need for faster digital development, but also the adoption of a new, more digital way of thinking. This is a time when knowledge wins, and knowledge today without digital transformation is like a long time ago, when someone had knowledge but could not write. It is a message that we all need to think about and work with joint efforts, quickly and safely, to reach global standards for digital policies and services and join the most developed countries in Europe and the rest of the world when it comes to digital transformation.

Information and communication technologies make life easier; make it better with the possibility of faster communication. The Montenegro Digital Transformation Strategy is a response of the Government of Montenegro and the Ministry of Public Administration, Digital Society and Media to numerous digital challenges imposed by everyday life.

That is why we are extremely proud that this strategic document, through numerous activities and recommendations, in cooperation with numerous stakeholders from the public, private, academic and civil sectors, guided by the needs of Montenegrin citizens, directed the further path of digital development of our country. Strengthening the ICT sector, technological environment, digital skills and competencies of all relevant stakeholders are extremely important, all in order to overcome the digital gap. Empowering the whole society's digital skills is of invaluable importance because exactly there lays the connection that we reflect through the field and activities that should be most represented in our education.

We are committed to Montenegro's economic progress, in all fields that will make the lives of our citizens better, but also bring us even closer to the values of the European Union, that is why the new digital transformation strategy is the four-year digital agenda of European Montenegro.

INTRODUCTORY WORD BY THE MINISTER OF PUBLIC ADMINISTRATION, DIGITAL SOCIETY AND MEDIA

Tamara Srzentić, MSc, Minister of Public Administration, Digital Society and Media

The mission of the Ministry of Public Administration, Digital Society and Media, Public Administration and civil servants is to serve the citizens of Montenegro by putting them and their needs at the centre of everything we do, of services and policies we create with them and for them. Public administration communicates with thousands of citizens every day and provides services of importance and public interest during some of the most critical moments in the lives of citizens. However, quite often, citizens have to search through a handful of different systems of numerous institutions and state administration bodies, visit numerous offices and call numerous telephone numbers in order to access the public services on which they depend.

In a world where we can order and get food online and pay bills online in a few minutes, the citizens of Montenegro expect that all other services be provided quickly and conveniently, that they are available to them, anywhere and

We must make Montenegro competitive in the region, in Europe, and even in the world. While we are committed to our long-term economic recovery, citizens of Montenegro expect to be supported and connected, their data to be safe, secure and accessible, to be able to do most things completely online, not to wait in long lines in public institutions, in daily interaction with public administration or the economy, and not to use huge amounts of paper to meet a requirement.

The first question we asked during the development of the digital transformation strategy was how we could create simpler, faster and better services for the citizens of Montenegro, together. By being willing to try new approaches. By working so that everyone can hear us, transparently and openly, by sharing the experiences gained, empowering citizens and enabling them to think differently about the way we implement programmes and create policies.

By creating more practical, reliable and affordable public administration services, saving the citizens of Montenegro both time and money. In short, by improving services and policies throughout the public administration, enabling interoperability between state administration authorities, providing access to the Internet and computer equipment to all, equally, transparently and without distinction.

The Strategy will help us, through numerous activities in cooperation with other ministries,

anytime. Public administration should not be different either.

Montenegro Digital Transformation Strategy is a key component of fulfilling digital ambitions, as well as a means that help us to improve public services and user experience, strengthen digital skills of society as a whole, reduce the digital divide, but also enable digital transformation and effectively manage it throughout the country.

The Strategy is a product of an inclusive and open process, as well as intensive cooperation of the team of the Ministry of Public Administration, Digital Society and Media and other ministries, business associations, ICT companies from the private sector, civil and academic sector, that worked with dedication on the development of the Montenegro Digital Transformation Strategy, while listening to the needs of citizens throughout Montenegro. In an inclusive and transparent process of public consultations, guided by the experiences and practices of many developed countries, numerous analyses of the situation, we recognised strategic and operational goals, as well as numerous activities within the Action Plan that will accelerate digital transformation of Montenegro. Technology has not changed our common mission in terms of services; it has given us new tools. As civil servants, but also as employees in the private sector, we all want to ensure that the policies, products and services we design meet the needs of our customers, whether our customers are parents, students or the elderly.

Our goal is to improve the capacities and capabilities for the digital transformation of Montenegro, but also to strengthen the digital awareness of Montenegrin society and the digital competitiveness of the ICT sector.

ICT companies, civil and academic sectors, to ensure that:

- citizens have digital skills and access to participate, work and succeed in the digital world;
- citizens are at the centre of services and policy design and actively participate in the development of government programmes and services; we have integrated and connected services, which are available to everyone and provide the best user experience anywhere and anytime;
- guided by the once-only principle, it will be necessary to enter information only once and in one place;
- we have an improved and innovative ICT ecosystem, but also the best information and communication technologies available to everyone;
- public services are located on the most modern infrastructure;
- we have increased awareness of citizens and the economy about the importance of digital development.

Only with joint efforts, can we successfully implement all activities from the digital transformation strategy, work on improving the entire digital environment, so let us not be just a "crowd of voices", and let us be a "crowd of hands" that will make Montenegro a digitally developed country.

CONTENTS

Abbreviations and Acronyms

- (O)RG – (Operational) Working Group
- AI – Artificial intelligence
- AMM – Association of Montenegrin Managers
- AmCham – The American Chamber of Commerce in Montenegro
- AZLP – Agency for Personal Data Protection
- GPD – Gross Domestic Product
- CANU – Montenegrin Academy of Science and Arts
- CBCG – Central Bank of Montenegro
- CIO – Chief Information Officer
- CIRT – Computer Incident Response Team
- CRPS – Central Register of Business Entities
- DEI – Diversity, Equity and Inclusion
- DT Strategy – Digital Transformation Strategy
- ECDL – Standard Certificate of ICT skills
- eDMS – Electronic Document Management System
- eID – Electronic Identity
- EC – European Commission
- EKIP – Agency for Electronic Communication and Postal Services
- ETF – European Training Foundation
- EU – European Union
- GDPR – General Data Protection Regulation of the European Union
- GSB – Government Service Bus Single (Single information system for electronic data exchange)
- GSV – General Secretariat of the Government
- ICT – Information and Communication Technology
- IoT – Internet of Things
- IRF – Investment and Development Fund
- JMB – Unique Identification Number
- SISEDE – Single Information System for Electronic Data Exchange
- CPD – Continuing Professional Development
- MBAN – Montenegrin Business Angels Network
- MED – Ministry of Economic Development
- MFSW – Ministry of Finance and Social Welfare
- MPADSM – Ministry of Public Administration, Digital Society and Media
- MoD – Ministry of Defence
- MONSTAT – Statistical Office of Montenegro
- MESCS – Ministry of Education, Science, Culture and Sports
- SME – Small and Medium Enterprises
- MoI – Ministry of Interior
- MH – Ministry of Health
- NCIRT – National Computer Incident Response Team
- NIN – National Identification Number
- NS eID – National Electronic Identification System

- NS NAT – Administrative Fee Collection System
- NTP CG – Science and Technology Park of Montenegro
- NGO – Non-governmental Organisation
- OECD – Organisation for Economic Co-operation and Development
- OGP – Open Government Partnership
- OSI – Online Service Index
- PAR – Public Administration Reform
- VAT – Value Added Tax
- TIN – Tax identification number
- PKCG – Chamber of Commerce of Montenegro
- RCC – Regional Cooperation Council
- SISEDE – Single Information System for Electronic Data Exchange
- SLA – Service Level Agreement
- SME – Small and Medium-sized Enterprises
- SRID – Strategy for Development of Information Society in Montenegro 2016-2020
- STEM – Science, technology, engineering and mathematics
- UN – United Nations
- UNDP – United Nations Development Programme
- UNICEF – United Nations International Children's Emergency Fund
- UZK – Human Resources Administration
- VET – Vocational Education and Training
- WB6 – Western Balkan 6 Economies
- ZOCG – Union of Municipalities of Montenegro
- ZUP – Law on Administrative Procedure

Definitions

- Digital identity - the identity of a person in a digital space that represents unique verified identification of that person.
- Digital signature - A set of data in electronic form that is added to or logically associated with electronic messages or documents and serves as a method of identifying the signatory.
- Interoperability - the ability of computer systems or software to share and use information.
- Open data - digital data available free of charge, reusable and republishable, and provided in a computer-readable and analytical format.
- P2P (peer-to-peer) - a model of communication over the Internet, a counterpart to the client/server model, most commonly used for file sharing.
- Data exchange - data exchange between different stakeholders.
- Cyber security - a set of technologies, processes, and practices designed to protect networks, devices, programmes, and data from attack, damage, or unauthorised access. Cyber security can also be described as information technology security.
- Electronic trust services - services for creating certificates for electronic signatures, electronic seals and website authentication; creation of electronic time stamp; electronic registered delivery service; verification of electronic signature and electronic seal; storage of electronic signatures, electronic seals or certificates related to these services. Electronic trust services that meet the special requirements prescribed by the Law on Electronic Government are qualified electronic trust services.
- Electronic time stamp - a set of data in electronic form that connects other data in electronic form with a specific time and thus proves that this data existed at that time.

I INTRODUCTION

Digitalisation of all segments of society is no longer just something to decide on, but it is also an important fact that one society faces at every step (from performing business tasks, through solving private requests, enrolling children in school, etc.). Digitalisation changes the lives of citizens, changing the way they work and perform everyday tasks. It also changes the way of working in the private sector, creating preconditions for working in a competitive environment that knows no geographical boundaries, but also affects the structure of the organisation in all areas. Viewed from the highest, national level, digital development is not only important for the functioning of the state as such, but also increasingly represents a competitive advantage in the international environment.

Despite the fact that digital solutions should be understood as a tool that can help in a more efficient and transparent system functioning, they represent a key contribution to achieving business and political goals. That is exactly why careful planning of their functionalities, interoperability, data sources and technical solutions is crucial in creating an effective digital environment and achieving personal satisfaction of all stakeholders in a society (citizens, business community, NGO sector, etc.).

Digital transformation is a continuous process that needs to be exponentially accelerated with the emergence of new technologies characterised by intensive and rapid development. Although the process of digital transformation should follow the pace of digital technology development, in order for it to be successful, there needs to be a good foundation in infrastructure, normative and institutional arrangements, data availability and management, educational programmes as a prerequisite for digital skills, cooperation with private sector, as well as incentives to use digital solutions. In addition, establishing a quality digital governance model and strengthening the ability to identify these opportunities is becoming more important than ever before.

The 2022-2026 Montenegro Digital Transformation Strategy represents a development framework that will define the preconditions and initiatives needed for rapid adaptation to the increasingly complex digital environment and agile and proactive development of digital Montenegro. With an efficient digital environment, which will create positive impacts on economic development, it will also contribute to the development of society as a whole. For that reason, the Digital Transformation Strategy should not be understood as a technical-development strategy, but is one of the key political and development documents, which also forms the basis for political decisions, changes in the regulatory environment, for investments and incentives.

Digital technologies are not linked to a specific industry or process, but are generally applicable in private and professional life, in all society's activities and segments. Digital infrastructure is becoming as important in society as water or electricity infrastructure, because it needs to be available to everyone, under equal conditions. The success of all other activities depends on its development. Therefore, in the process of drafting the 2022-2026 Montenegro Digital Transformation Strategy, the key need for all state authorities and public institutions to participate in a coordinated and active manner and promote active involvement of the private and non-governmental sector was recognised. The quality of coordination of the implementation of digital transformation is therefore specifically addressed in the Strategy.

The described strategic intention is supported by the strategic commitments of the European Union, which clearly emphasised “the green" and "the digital" as the central development goals of the entire European region. During the development of the Digital Transformation Strategy, these principles were included and these guidelines were followed, bearing in mind that Montenegro wants to persevere on the path of a modern, prosperous European country.

The two key megatrends - "the green" and "the digital" - although different, in a new, modern society are closely connected. On the one hand, digital technologies are very "green" and significantly add value to society, and on the other hand, they can effectively contribute to reducing the negative impact on the environment and strengthen the environmental component of sustainability. The latter is especially important for Montenegro as a tourist country.

In addition, a sustainable component means not only caring for the environment, but also caring for the social and economic good. The social component emphasises the diversity and active participation of all social groups, which has proven to be extremely efficient and accessible information tools. In addition, by systematically promoting modern technologies, developing digital skills and increasing the degree of connectivity, the economic success of Montenegro will be encouraged. High added value of digital technologies, relatively low required investments compared to other infrastructure investments and availability of the global market, also represent an exceptional opportunity for industrial development of Montenegro, which is why the Strategy placed special emphasis on promoting the ICT sector.

Compliance with the EU strategic framework and international obligations

In the process of preparation of the Draft Montenegro Digital Transformation Strategy 2022-2026, the broader strategic framework of the European Union was considered, which was taken into account when defining goals and actions.

The most comprehensive and relevant strategic document analysed is Europe’s Digital Decade: Digital Targets for 2030[1] presented on March 9 2021. The document sets out a vision for Europe's digital transformation by 2030. It is also presented as the **Digital Compass** and focuses on four main aspects: skills, infrastructure, government and business.

Since a large part of the Montenegro Digital Transformation Strategy 2022-2026 is related to data directly or indirectly, in the preparation of the Strategy, the **European Data Strategy[2]** was used as a basis for harmonisation towards European goals.

One of the most important challenges identified in the *Situation Analysis for Preparation of Montenegro Digital Transformation Strategy 2022-2026* was the lack of digital skills at several levels (employees in private and public organisations, students, but also the general public). Therefore, the **European Skills Agenda[3]** with the goals to be achieved by 2025 is the main umbrella strategic framework that will guide the Montenegro Digital Transformation Strategy 2022-2026. A more concrete policy, the **Digital**

[1] https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

[2] https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en

[3] https://ec.europa.eu/social/main.jsp?catId=1223

Education Action Plan[4] has been developed to simplify actions to achieve the European countries' goals in the digital field for the 2021-2027 period. In addition, this document was considered in the process of drafting the Strategy.

The **European Industrial Strategy**[5] was published on March 10, 2020. Under the impact of the COVID-19 crisis, an update was required to achieve relevance and effective support to EU countries in their transition to a green and digital economy. Since the European Industrial Strategy emphasises, supports innovations in various ecosystems, small and medium enterprises (SMEs), and focuses on start-ups, this document is also one of the most important EU documents to be followed in the process of drafting the Montenegro Digital Transformation Strategy 2022-2026. The need to strengthen the ICT sector in Montenegro is recognised as one of the most important challenges and potentials in situation analysis.

The Economic and Investment Plan for the Western Balkans[6] aims to foster the region's long-term economic recovery, support green and digital transition, regional integration and convergence with the European Union. The plan will support sustainable connectivity, human capital, competitiveness and inclusive growth, as well as the dual green and digital transition.

When it comes to the regional level of the Western Balkans - the **Common Regional Market**[7] is built on the achievements of the Regional Economic Area. It is a springboard for the region's closer integration with the EU's single market before accession. More specifically, the **2021-2024 Common Regional Market Action Plan**[8] was considered as a basis for defining operational objectives and actions in the field of data and strengthening the ICT sector.

In addition to all these EU strategic documents, **the priorities** set by the current European Commission for the 2019-2024 period were also considered in the preparation of this strategic document.

These four EU directives in the field of data are set as a basis for defining objectives and activities to improve the availability and interoperability of data and improve the quality, quantity and use of e-services:

● Directive 2013/37/EU[9] of the European Parliament and of the Council of 26 June 2013 amending Directive 2003/98 / EC on the re-use of public sector information;

● Directive (EU) 2019/1024[10] of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information;

● Regulation (EU)2018/1807[11] of the European Parliament and of the Council of 14 November 2018 on a framework for the free flow of non-personal data in the European Union;

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[4] https://ec.europa.eu/education/education-in-the-eu/digital-education-action-plan_en

[5] https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy_en

[6] https://ec.europa.eu/commission/presscorner/detail/en/IP_20_1811

[7] https://www.rcc.int/pages/143/common-regional-market

[8] https://www.rcc.int/events/1394/shaping-the-common-regional-market-crm-2021-2024-action-plan

[9] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32013L0037

[10] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2019.172.01.0056.01.ENG

[11] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018R1807

● Regulation (EU)2016/679[12] of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data and repealing Directive 95/46/EC - General Data Protection Regulation.

Montenegro's Programme of Accession to the European Union 2021 – 2023[13] (PPCG) is a strategic document comprising 33 negotiating chapters, which is adjusted annually to changes in the process of developing EU law. In accordance with that, in order to align this document with the new acquis communautaire, but also the dynamics of the adoption of national legislative and strategic documents, the 2021 – 2023 Accession Programme stated the development of the Montenegro Digital Transformation Strategy.

Montenegro opened Chapter 10 **- Information Society and Media at the Intergovernmental Conference** held on March 31, 2014 in Brussels. The following sub-areas are included in Chapter 10: Electronic Communications, Information Society Services and Audiovisual Policy, out of which Electronic Communications and Information Society Services are covered by this Strategy.

Chapter 10 brings numerous benefits for the citizens of Montenegro, both for providers and users of services. The benefits of this chapter are reflected in broad Internet access (the aim is to provide everyone, regardless of physical distance, with high-speed Internet access), electronic communications (mobile and fixed telephony), a large number of electronic services for more efficient and faster procedures (company registration, examinations scheduling, electronic identification), protection of minors from inappropriate content, with mandatory indication of which programmes are appropriate for which age, promotion of national and European cultural heritage and the like.

The European Commission's 2021 Annual Report for Montenegro[14] states that Montenegro has the same level of readiness (moderately ready) and the same level of annual progress (limited progress) as in previous year's report for Chapter 10. The report noted a positive trend in legislative changes in the area of information security and activities related to the improvement of e-services.

The Montenegro Digital Transformation Strategy 2022 - 2026 follows the key objectives defined by the IPA III Pre-Accession Support Programme.

The European Union has incorporated the **UN's 2030 Agenda for Sustainable Development**[15] into its acquis and policies and is one of the leading international entities in its implementation. In this context, the European Commission, within the political guidelines of its work for the period 2019-2024, has defined six priorities with the ambition to make the European continent the first continent that is climate neutral, to improve the prosperity of its citizens and social justice, to empower its citizens with new generation of technologies, to ensure equality in the Union area and to enhance the democratic capacity of European institutions, as well as to promote these values in its foreign policy through global leadership.

Looking at this systemic attitude of the EU towards the 2030 Agenda of Sustainable Development in the context of Montenegro's EU accession process, it is clear that there is strong synergy between the EU

[12] https://eur-lex.europa.eu/eli/reg/2016/679/oj

[13] https://www.gov.me/en/documents/75fd43fa-de2e-4e70-9a1f-08e6fa224235

[14] https://www.gov.me/dokumenta/b5f98cf5-f6a6-476b-9216-3133e67a8886

[15] https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E

accession process and achieving sustainable development goals, and that harmonisation of legislation and policies with the EU is de facto fulfilment of 2030 Agenda for Sustainable Development requirements and a strong impetus towards achieving the sustainable development goals. Accordingly, Chapter 10 - Information Society falls under the objective of Industry, Innovation and Infrastructure. In addition, out of the 17 identified goals in the 2020-2030 Agenda for Sustainable Development, through **the goal 9, Industry, Innovation and Infrastructure, emphasis is placed on the digitalisation process** through sustainable investment in infrastructure and innovation as a key driver of economic growth and development.

Positioning in strategic framework of Montenegro

With the Prime Minister's exposé, presented on December 2, 2020, the cornerstone for the priorities that determine the vision of Montenegro's development was laid. These priority areas are the backbone of policy planning in the coming period, and digital transformation has been recognised as one of the six recognised goals within the key priorities of the Government of Montenegro. The **Government of Montenegro 2021 Work Programme**[16] identifies digital transformation as one of the strategic priorities that represents the driver of innovation, modernisation, competitiveness and comprehensive socio-economic development. Citizens and the economy should be at the centre of the Government's activities, and the services we provide to them should be optimised in a way that meets their needs in a fast, efficient and simple way, through new technologies and tools.

Due to its scope and multi-sectoral nature, **the Digital Transformation Strategy** has the significance and scope of an umbrella strategic document in the field of digitalisation, whose defined priorities are elaborated in detail in a number of sectoral public policy documents.

The National Strategy for Sustainable Development of Montenegro 2016-2030[17] (NSSD) sets ambitious goals for quality education (SDG 4), inclusive and sustainable economic growth, full and productive employment and decent work for all (SDG 8), peace, justice and strong institutions (SDG 16) and partnerships to achieve goals (SDG 17). The NSSD ensures the achievement of national goals, while the Montenegro Digital Transformation Strategy 2022-2026 elaborates the goals in detail to the level of specific activities for the 2022-2023 period.

Montenegro Development Directions 2018-2021[18] in the field of information and communication technology, recognise the importance of the availability of electronic services through the improvement of the business environment for the use of services in everyday life and business, as well as the improvement of electronic identification and increasing trust in electronic transactions.

The new **Montenegro Economic Reform Programme 2022-2024**[19] **(PER)** - (ERP) - whose development is underway, will include reform measures that will directly affect the processes of digitalisation of society in Montenegro, which is recognised through the new area of Digital Transformation.

[16] https://www.gov.me/clanak/program-rada-vlade-crne-gore
[17] https://www.gov.me/dokumenta/6852d215-af43-4671-b940-cbd0525896c1
[18] https://www.gov.me/dokumenta/1a5fab12-ec7a-4f28-b1e9-83c9d0dadb79
[19] https://www.gov.me/dokumenta/2e3bf859-0506-4fe6-b21f-356f4f041b48

Montenegro Industrial Policy 2019-2023[20] - defines the priorities of digitalisation through Strategic Goal 3 (encourage innovation, technology transfer and entrepreneurship development through improved infrastructure for innovation and cooperation of research institutions and companies, strengthened administrative capacity for access to EU funds, development of institutional infrastructure and support services for entrepreneurship, green economy development, support for the diversification of the supply of the industrial sector and the dynamic digitalisation of society and the economy) as well as through Operational Objective 3.7. (Encouraging the digital transformation of a company through the digitalisation of the process, it is necessary to establish new business models of companies that lead to new offers of products and services, as well as new forms of relationships with customers and employees). Activities under this operational objective include specific various measures and activities of digitalisation of Montenegrin companies with a focus on industrial sector enterprises in the segment of advisory support for business improvement through digital transformation, organisation of various events to support start-ups in the direction of digitalisation, preparation of various analytical and strategic documents in the field of digitalisation of the Montenegrin economy and other related activities.

The Smart Specialisation Strategy 2019 - 2024[21] identifies the priority area, Information and Communication Technologies, Digital Transformation Programme. The programme aims to reorganise and improve business processes in priority areas of smart specialisation and public administration through digital technologies.

The Strategy for Development of Micro, Small and Medium Enterprises in Montenegro 2018 - 2022[22] identifies the need for digital business transformation through one of the key priorities in the development of entrepreneurship and raising the competitiveness of SMEs in Montenegro. Within the strategic goal of strengthening the competitiveness of MSMEs, the operational objective of Digital Business Transformation was recognised.

The Strategy for Education System Digitalisation 2022-2027 includes all levels of education except tertiary and non-formal education, which is covered by the Montenegro Digital Transformation Strategy 2022-2026.

The **Public Administration Reform Strategy 2022 - 2026** – drafting of this strategic document is underway. Through Strategic Goal 1 (Organisation and work of public administration in the function of citizens' needs) and Strategic Goal 2 (Citizens and the economy use quality public administration services) it will recognise paperless administration, full interoperability of information systems and increase the number of electronic services at a high level of sophistication as well as the introduction of a central monitoring system for service provision.

The Cyber Security Strategy of Montenegro 2022 - 2026, which includes, among other things, activities related to the harmonisation of the legislative framework with the European Union's General Data Protection Regulation (GDPR) and the establishment of critical information infrastructure protection.

[20] https://www.gov.me/dokumenta/b6d2c966-ac8b-409a-bcf5-acdce90c36d9
[21] https://www.gov.me/dokumenta/18205a91-1afc-4eb7-a5cb-8ad5bd0b7712
[22] https://www.gov.me/dokumenta/d3f71b72-fa31-4d94-80dd-18ce93096226

II SITUATION ANALYSIS

The analysis of the existing digital ecosystem of Montenegro is a document that sets guidelines for the preparation of strategic and operational objectives for the Montenegro Digital Transformation Strategy 2022-2026 (hereinafter the Strategy).

The Situation Analysis was prepared on the basis of data and information based on official documents and existing relevant analyses, data obtained from interviews conducted with various governmental, economic, non-governmental (NGO) and academic organisations, as well as representatives of the 2022-2026 Digital Transformation Strategy Working Group, who actively participated with their ideas, suggestions and analyses during the preparation of this document.

The document presents a comprehensive overview of the current situation in various technical, organisational, legal, social and other aspects of digital transformation, as well as the main challenges that will be addressed by the Digital Transformation Strategy. All arguments and findings presented here are supported by concrete data and information in individual segments (organisation and coordination; e-services and e-service design; eID, trust and cyber security; data availability and interoperability, accessibility and (critical) infrastructure; skills and education, ICT industry, digital readiness of Montenegrin society). In addition, the SWOT analysis brings together the main challenges identified by the Strategy.

Methodological framework and workflow

The digital transformation strategy is horizontal and multifunctional and applies to all parts of Montenegrin society - public administration, local government and the wider public sector, the economy, academia, the scientific community, NGOs and civil society.

Due to its comprehensiveness, and in order to ensure the optimal relationship between the required resources and the progress achieved, it is necessary to:

- *apply a holistic approach* with a comprehensive overview of all the most important existing strategies, various relevant documents (analysis, assessments, interviews, reports from public consultations, evaluations, etc.), regulations, information and data;
- *efficiently identify* the most important challenges that the strategy will address with the necessary alignment and integration with the Montenegrin strategic ecosystem and the priorities of the Government of Montenegro;
- *identify* key stakeholders and decision makers for successful digital transformation.

The Situation Analysis was prepared in order to identify and define strategic and operational goals, with the development of measures for their implementation, in accordance with the *Methodology of Policy Development, Preparing and Monitoring of Implementation of Strategic Documents*.

The analysis identified key units within the following chapters:

- Organisation and coordination
- eServices and service design
- eIdentification, electronic trust services and cyber security
- Availability, interoperability and data management
- Digital connectivity
- Skills and education
- ICT industry

2022-2026 Digital Transformation Strategy Preparation Process

The strategy was prepared in cooperation with relevant stakeholders and the Operational Working Group (OWG) for the preparation of the strategy, which consists of representatives of the following institutions:

- General Secretariat of the Government of Montenegro;
- Ministry of Public Administration, Digital Society and Media;
- Ministry of Finance and Social Welfare;
- Ministry of Economic Development;
- Ministry of Education, Science, Culture and Sports;
- Ministry of Health;
- Ministry of Interior;
- Agency for Electronic Communications and Postal Services;
- NGO 35mm;
- NGO Multimedia MNE;
- Banking sector;
- Academia;
- Telecommunications sector;
- ICT community[23]

[23] The ICT community consists of associations of business associations of the Chamber of Commerce of Montenegro, the Union of Employers, the Council of Foreign Investors of Montenegro, the American Chamber of Commerce in Montenegro and the Montenegro Managers Association, Telenor, Mtel and Crnogorski Telekom and Digitalizuj.me, Dev Club, ICT Cortex and the Montenegrin IT cluster

The Operational Working Group was responsible for collecting documentation and providing relevant information in order to identify and define as accurately as possible the key issues identified in the situation analysis. In addition to OWG meetings, special meetings were held with representatives of the Ministry of Economic Development in order to gather information on the economic aspect of digital transformation. During these meetings, special emphasis was placed on the analysis of the existing legislation, programmes, coordinating bodies, ICT sector.

During the meetings and discussions, the basic challenges and opportunities were highlighted, which are described in detail in the following chapters and supported by concrete quantitative data.

The following methods were used in the preparation of the situation analysis:

- *analysis of available documentation*
- *desktop research* (collecting quantitative and qualitative information with international reference data)
- *online survey,* aiming to identify the main challenges in the field of digitalisation and setting priorities based on pre-defined criteria

During the preparation of the Situation Analysis, the comprehensive documentation covering the area of digital transformation was reviewed and analysed. In this regard, the documentation reviewed in the situation and problem analysis included:

- **Legislative framework:**
  - Law on Electronic Government (Official Gazette of Montenegro, No. 72/19);
  - Law on Electronic Identification and Electronic Signature (Official Gazette of Montenegro, No. 31/17 and 72/19);
  - Law on Electronic Document (Official Gazette of Montenegro, No. 5/08 and 40/11), Draft Law on Amendments to the Law on Electronic Document which is in preparation;
  - Law on Services (Official Gazette of Montenegro, No. 71/17 and 67/19);
  - Law on Information Security (Official Gazette of Montenegro, No. 14/10, 40/16, 74/20 and 67/21);
  - Law on Free Access to Information (Official Gazette of Montenegro, No. 44/12 and 30/17);
  - Law on Personal Data Protection (Official Gazette of Montenegro, 79/08, 70/09, 44/12 and 22/17);
  - Law on Administrative Procedure (Official Gazette of Montenegro, No. 56/14, 20/15, 40/16 and 37/17);
  - Law on Electronic Communications (Official Gazette of Montenegro, No. 40/13, 56/13, 02/17 and 49/19);
  - Law on Health Care (Official Gazette of Montenegro, No. 3/16, 39/16, 2/17, 44/18, 24/19, 82/20 and 8/21);

- Law on Critical Infrastructure Designation and Protection (Official Gazette of Montenegro, No. 72/19);
- Law on Identity Card (Official Gazette of Montenegro, No. 12/07, 73/10, 28/11, 50/12, 10/14 and 18/19).

- **Strategic documents, analyses and other documentation:**
  - Information Society Development Strategy 2016-2020;
  - Final Report on Implementation of Information Society Development Strategy 2016-2020;
  - Public Administration Reform Strategy 2016-2020;
  - 2018-2020 Action Plan for Implementation of 2016-2020 Public Administration Reform Strategy in Montenegro;
  - Draft concept of the 2022-2026 Public Administration Reform Strategy;
  - Report on consulting the interested public in the process of preparation of the Montenegro Digital Transformation Strategy (May, 2020);
  - Analysis of the state of electronic services with proposed measures for their improvement, Ministry of Public Administration, Digital Society and Media (July/November, 2020);
  - Quantitative analysis of the use of eService in Montenegro in the February 1 – May 5 2020 period, (Ministry of Health, May 2020);
  - Montenegro Digital Agenda Observatory;
  - Country Report and Roadmap for Improving the Digital Agenda in Montenegro (ICEDA project, June 2020);
  - Use of Information and Communication Technologies in Montenegro in 2019[24] (MONSTAT, 2019);
  - Cyber Security Strategy of Montenegro 2018 - 2021[25];
  - 2019 National Interoperability Framework[26];
  - Smart Specialisation Strategy 2019 - 2024;
  - Digital Innovation Profile of Montenegro (International Telecommunication Union - ITU, Regional Office for Europe, and the Innovation Division of the ITU Telecommunication Development Bureau, 2020);
  - Competitiveness in South East Europe 2021, A Policy Outlook[27], OECD;
  - Analysis of the legal framework of digital governance in Montenegro, UNDP, 2021 (working version);
  - Strategy for the development of an integrated information system for eHealth 2018 - 2023 with the Action Plan 2018 - 2021;

[24] https://www.monstat.org/userfiles/file/ICT/2019/Upotreba%20IKT%20u%20domacinstvima%202019_Final.pdf

[25] https://www.gov.me/dokumenta/fa24a8c6-2241-4d6f-9297-328636b157e5

[26] https://www.euprava.me/ResourceManager/FileDownload.aspx?rId=85&rType=2

[27] https://buducnostzasve.me/

- Monitoring the development of the Digital Agenda in the Western Balkans; Basic research on the state of development of e-government and digital literacy in the target countries of the Western Balkans 2020 (ICEDA project report);
- Digital Maturity Assessment of Montenegro, Report, August 2021 (EGA, EBRD);
- White Paper - Investment Climate in Montenegro, 2020 Foreign Investment Council;
- Human Development Report for Montenegro 2020 - Towards a Digital Future for All[28], UNDP;
- Research: Impact of ICT on the development of Montenegro, UNDP;
- eServices research with citizens and businesses, narrative report, 2019, UNDP;
- Catalogue of eServices - 2019, UNDP;
- Improving the quality of public services - analysis of the legal framework, UNDP
- Open Source Software Country Intelligence Report Montenegro[29], EC, DIGIT, 2021;
- eGovernment System Design Methodology, 2005-2006, IPMIT, d.o.o., Ljubljana;
- Methodology for eGovernment Project Management, 2005-2006, IPMIT, d.o.o., Ljubljana;
- Methodology for Measuring Success of Information Society Development in Montenegro, 2005-2006, IPMIT, d.o.o. Ljubljana;
- Digital Skills Insights, ITU 2019[30];
- Assessment of Institutional Framework of Digital Governance in Montenegro, UNDP, 2021 (working version);
- Analysis of Internal IT Systems, UNDP, 2021 (working version);
- Report on Training Needs Assessment for Public Administration Employees, July 2021, DAMAR, UNDP;
- Study on Implementation of Open Data Concept in Montenegrin Institutions, March 2021, PKCG.

In accordance with the results of these analyses and other documentation bases, the connection between the Montenegro Digital Transformation Strategy 2022-2026 with other relevant state strategies and legal framework has been established.

The Montenegro Information Society Development Strategy 2016-2020, the implementation of which was coordinated by the Ministry of Public Administration, Digital Society and Media and the Ministry of Economic Development within their competencies, was implemented through three action plans in the period from 2016 to 2020. The implementation of various activities involved state administration bodies, regulators and the academia.

[28] https://files.cargocollective.com/c953148/NHDR-2020-CG.pdf

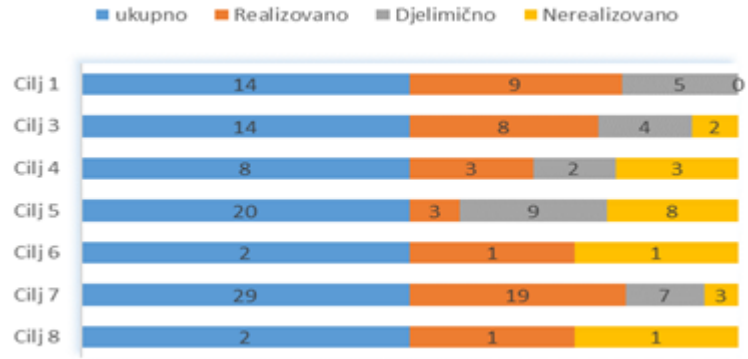
[29] https://joinup.ec.europa.eu/sites/default/files/inline-files/OSS%20Country%20Intelligence%20Report_MO.pdf

[30] https://www.itu.int/dms_pub/itu-d/opb/phcb/D-PHCB-CAP_BLD.03-2019-PDF-E.pdf

In order to assess the current level of digital maturity of Montenegro, the results presented in the Final Report on the Implementation of the Information Society Development Strategy 2016-2020[31] were evaluated. After the expiration of the four-year period of validity of the Information Society Development Strategy 2016-2020, which identified strategic development directions in order to achieve EU standards set in the Digital Agenda 2020 and the Digital Single Market Strategy, it can be stated that the implementation of the activities themselves was not at a satisfactory level, although some progress in implementation in terms of individual strategic goals was recognisable.

Namely, 50% of all activities were fully implemented, 31% of activities were partially implemented, and 20% of planned activities remained not implemented. When it comes to the overall effect over four years, i.e., performance indicators, progress was recorded in 23 out of 35 indicators, while for five indicators no measurable data were found or the relevance of their monitoring expired.

As a reason for the delay or lack of implementation of a large number of activities, the institutions especially recognised the specificity of the situation caused by the COVID-19 pandemic, in addition to the lack of funds and capacity. Although the new circumstances affected the way citizens communicate with their administration and generally encouraged positive changes in several strategic areas, all resources were largely geared towards responding to the new situation, and as a result, many previously planned regular activities were neglected. In addition, the lack of consensus of relevant institutions in defining priorities and deadlines, lack of financial resources and ambitious deadlines were recognised as key challenges.



Total Implemented Partially Implemented Not implemented
Goal

Graph: Overview of the implementation of specific activities by the following objectives (fields): 1) infrastructure for broadband access; 3) e-business; 4) e-education; 5) e-health; 6) e-inclusion; 7) e-government; 8) research, innovation.

The new Montenegro Digital Transformation Strategy 2022-2026 aims to recognise the principles on which to build further transformation of society through convergence and adoption of principles that not

[31] https://www.gov.me/dokumenta/649059ca-2519-43ff-9df7-6ec32b44148b

only European Union guides itself by, but also other developed countries, taking into account the specifics of Montenegrin society. In addition to this, these strategic documents will - if the findings of the Situation Analysis indicate so when interpreting the effects and shortcomings of the previous Information Society Development Strategy 2016-2020 - cover certain activities from the Strategy too, but will emphasise some completely different activities, regardless of possible similar strategic pillars and directions of development, considering the speed of changes in technological preconditions and the emergence of new needs and opportunities. Therefore, the questions remain the same, but the answers are different.

Organisation and coordination

Based on the analysis of the collected documentation, information obtained during the public consultations for the preparation of the Strategy, as well as key challenges highlighted by the Operational Working Group, the importance of establishing **a central coordinating body for managing and directing activities for successful digital transformation** was recognised. The importance of establishing such a body is reflected in the fact that there is currently a very high fragmentation of goals, responsibilities, working bodies and strategic documents in this area. In addition, there are some overlaps in the responsibilities of the existing advisory bodies, as well as the need for precise positioning of their role and areas of action at a certain level - social or sectoral.

The Government of Montenegro 2021 Work Programme[32] identifies objective 5.5, which is explicitly within the competence of the Ministry of Public Administration, Digital Society and Media (MPADSM) and which focuses on the development of digital society and improving the degree of digital transformation of products and services for citizens and businesses. In addition, and in order to regulate e-government in Montenegro, the Law on Electronic Government was adopted in 2019[33].

Existing working bodies with coordination tasks and their responsibilities, which also enter the domain of digital transformation, are presented in Table 1.

Name of the Council	Description	Administrative and professional tasks on behalf of the Council are performed by	Public-Social / Sectoral / organisational level

[32] Government of Montenegro (2021); Work Plan of the Government of Montenegro for 2021.

[33] Law on Electronic Government Official Gazette of Montenegro, No. 72/19 (2019)

Innovation and Smart Specialisation Council	The responsibilities of this key advisory body in the field of innovation and smart specialisation policy, as an umbrella strategy that networks several sectoral policies, relate to: - proposing to the Government policies and strategies regulating the field of innovation and technological development in Montenegro; - giving opinions on draft laws and other regulations in the field of innovation and other areas, which provide general conditions for fostering innovation activity and the use of its results; - monitoring the implementation of strategies governing the field of innovation and technological development in Montenegro; - identification of programmes of general interest in the field of innovation and smart specialisation; - cooperation with other councils and entities of the national innovation system; - monitoring the activities of state administration bodies and other competent authorities and institutions in terms of determining investment priorities and implementing measures defined by strategic development documents in the field of innovation, giving opinions and proposing coordination of instruments; - proposing a national structure for the implementation of the Smart Specialisation Strategy of Montenegro (2019-2024); - consideration of annual reports on implemented activities of the Smart Specialisation Strategy of Montenegro (2019-2024) and submission of comments	Ministry of Economic Development	Public-Social

	to the administrative body, i.e., the body responsible for coordination of report preparation, and - public promotion of the importance of innovation and smart specialisation for the overall socio-economic development of Montenegro and improving the quality of life of citizens		
Competitiveness Council	Coordinates activities in the field of implementation of priority reform measures defined by strategic development documents, which are in the function of removing key obstacles to greater competitiveness of the economy and faster economic growth of Montenegro. The goal is for its actions to contribute to greater competitiveness of the economy and faster economic growth of the country. This includes not only work on improving processes and procedures, but also proposing structural reforms to improve competitiveness, drafting a plan to combat the gray economy, improving the labour market and employment. One of the important tasks of the Council is to promote publicly the importance of dialogue between the private and public sectors with the aim of improving competitiveness, creating a stimulating business environment and improving the quality of life of citizens.	Secretariat of the Competitiveness Council established on the basis of the Memorandum of Understanding between the Government of Montenegro and the European Bank for Reconstruction and Development	Public-Social
Electronic Government Council	The tasks of the Council are to: - inform the Government of Montenegro on all important issues related to the development of electronic government and information and communication technologies; - direct, coordinate and monitor activities related to the development of electronic government, between state authorities, state administration bodies, local self-government bodies, local government	Ministry of Public Administration, Digital Society and Media	Sectoral

	bodies and other bodies, in accordance with Articles 1 and 2 of the Law on Electronic Government; - consider professional issues in the field of information and communication technologies, which are related to the development of electronic government; - consider draft regulations, secondary legislation, strategic, planning and other documents in the field of electronic government and information and communication technologies, aiming to digitally transform Montenegro; - initiate changes in the existing legislation in the field of digitalisation and e-government; propose measures for harmonisation of the legislative and administrative framework in order to improve the development of e-government; - work on the improvement of cooperation in the field of electronic administration and information and communication technologies between state authorities, state administration bodies, local self-government bodies, local government bodies and other bodies, in accordance with Articles 1 and 2 of the Law on Electronic Government; - work on the improvement of international cooperation in the field of electronic administration and information and communication technologies		

Public Administration Reform Council	The tasks of the Council are, inter alia, to monitor the implementation of the Public Administration Reform Strategy with accompanying action plans and public finances management programme, ensure publicity and transparency of the public administration reform process, monitor priorities, dynamics and deadlines for implementation of measures and activities whose holders are state authorities, state administration bodies and local self-government bodies and evaluate the achieved results in implementing the goals of the reform. The ultimate goal of the reform is to provide high quality services to citizens, create public administration that will contribute to economic stability, increase the quality of life and economic competitiveness, and at the same time meet the conditions for EU membership.	Ministry of Public Administration, Digital Society and Media	Sectoral
Open Data Portal Management Council	The establishing of the open data portal management body provides proactive communication with the authorities in order to publish as many data sets as possible, which further strengthens the capacity to raise the level of transparency of public administration and the entire Government. The tasks of the Council are: - proactive communication with authorities in order to publish as many data sets as possible; - portal management and promotion; - mapping open data challenges and finding solutions to them; - activities to improve the transparency of public administration	Ministry of Public Administration, Digital Society and Media	Sectoral

Platform for exchange of ideas established	The formation of this cluster creates a greater opportunity to contribute to the successful process of creating and implementing the Montenegro Digital Transformation Strategy through synergy.	Participants: Chamber of Commerce of Montenegro, Montenegro Managers Association, Union of Employers of Montenegro, Council of Foreign Investors of Montenegro, AmCham Montenegro, Crnogorski Telekom, Telenor Montenegro, Digitalizuj.me, DevClub and ICT Cortex	Public-Social level

TABLE 1. OVERVIEW OF MAIN WORKING BODIES FOR COORDINATION IN THE DIGITAL SOCIETY FIELD

The initiative for the establishment of a **coordination and advisory body for digital transformation** that would lead and manage the process of digital transformation in Montenegro was launched by the business sector and, in line with the idea, as an example of successful implementation of this solution, an overview of existing coordinating bodies in other European countries was prepared. Through this initiative, it was proposed that the coordinating body involve all relevant stakeholders (business, public sector and academia) and that they define measures for successful digital transformation, together, through dialogue.

Key issues regarding the central coordinating body, its responsibilities, composition and links with other (existing) bodies are defined in the *(2021) Digital Maturity Assessment*[34] document. This document identifies the need for ministries and stakeholders to increase their coordination efforts at all levels, and directors of directorates responsible for the implementation of digital solutions or individuals responsible for ICT of different ministries and entities should ensure higher level of alignment and coordination at a more specific level through joint cooperation. Proposals for solving these challenges will be an integral part of the Montenegro Digital Transformation Strategy 2022-2026. In addition, several important bodies are also engaged in the implementation of the PAR (Public Administration Reform).

[34] Assessment of digital maturity of Montenegro; E-gov Academy; Estonia; EBRD-funded project, Montenegro: QUICK ADVISORY RESPONSE 2.0 - Digital Maturity Assessment

In addition to the bodies described in Table 1, an important role in the digitisation process is performed by qualified electronic trust service providers. According to the Register of Qualified Electronic Trust Service Providers maintained by the Directorate for Norms and Standardisation within the Ministry, four qualified providers of electronic trust services have been entered (Table 2).

Electronic Trust Service Providers	Type of service provided
Montenegro Post AD Podgorica	• Producing a qualified certificate for electronic signature; • Producing a qualified certificate for electronic seal; • Producing a qualified time stamp; • Producing a qualified certificate for website authentication; • Qualified electronic registered delivery service.
CORE IT DOO	• Producing a qualified certificate for electronic signature; • Producing a qualified certificate for electronic seal; • Producing a qualified electronic time stamp.
Ministry of the Interior	• Qualified certificate for qualified electronic signature and certificate for electronic identification, within the identity card.
Crnogorski Telekom A.D. Podgorica	• Producing a qualified certificate for advanced electronic signature; • Producing a qualified certificate for advanced electronic seal; • Producing a qualified electronic time stamp; • Producing qualified certificates for qualified electronic seal and qualified electronic signature; • Provision of qualified verification services (qualified electronic signatures and qualified electronic seals).

TABLE 2. QUALIFIED ELECTRONIC TRUST SERVICE PROVIDERS

Bearing in mind that the field of digital transformation covers a much broader aspect of change, such as issues of ensuring information security, reliable information infrastructure, personal data protection, etc., bodies have been formed but also competencies have been defined in institutions dealing with these topics, such as follows:

- **Council for Information Security** - Pursuant to Article 13a of the Law on Information Security (Official Gazette of Montenegro, No. 14/10 and 40/16, 74/20 and 67/21), the Government of Montenegro established the Council for Information Security. The tasks of the Council are to inform the Government of Montenegro on important issues related to information and cyber security; initiate and propose measures to improve information and cyber security in the public and private sectors; oversee the implementation of the Montenegrin Cyber Security Strategy 2018-2021 and action plans for its implementation; monitor and coordinate activities in the field of information and cyber security; propose measures for harmonisation of the legislative and administrative framework in order to improve the information and cyber security of Montenegro; improve cooperation in the field of information and cyber security between state authorities, state administration bodies, local self-government units, legal entities exercising public authority and other legal and natural persons gaining access to or processing data in accordance with the Law on Information Security. In addition to coordinating these activities and role in improving cooperation with the private sector in the field of information and cyber security as well as international cooperation in the field of information and cyber security, the Council also informs the National Security Council in case of major threats and cyber incidents and files a report to the Government of Montenegro at least once a year.
- **Department of Information Security and Computer Incident Response (CIRT)** - In accordance with the Law on Information Security, the Directorate for Information Security and Computer Incidents - CS / NCIRT (National Computer Incident Response Team) reports to the Directorate for Protection of Classified Information which is an independent body under the supervision of the Ministry of Defence and coordinates the work of local CIRT teams. The obligation to establish local CIRT teams in institutions is crucial for the national CIRT infrastructure, which is also envisaged by the Cyber Security Strategy 2018-2021 and the accompanying Action Plan.
- **Agency for Personal Data Protection** - The Agency for Personal Data Protection acts as a supervisory body in accordance with the Law on Personal Data Protection. In performing the tasks within its scope, the Agency is independent. The Agency has the status of a legal entity. The Agency is responsible for performing administrative and professional tasks related to personal data protection.
- **Working groups/teams** that monitor the implementation and development of certain areas, such as:
    - Interagency working team for monitoring the development of electronic services;
    - Open data working team;
    - Interagency working team for monitoring implementation for electronic document management and preparation of proposals for further implementation;
    - Interagency expert team for interoperability of registers.

Although these working groups made many recommendations and recognised various challenges during their work, the institutions rarely took concrete actions based on the information obtained. The work of these working groups was suspended during the COVID-19 pandemic, followed by organisational changes in the Government of Montenegro, so it is necessary to revise them or form new working groups. In addition to these working bodies in the Government, the business sector, recognising the importance of

digital transformation of the entire society, has formed a number of working and consultative bodies that coordinate activities, identify obstacles and propose measures for efficient digital transformation. Some of the working bodies that are actively involved in the digital transformation process are:

- Committee for Information and Communication Technologies of PKCG;
- Committee for Digital Transformation – Montenegro Managers Association;
- Committee on Digital Transformation - American Chamber of Commerce in Montenegro;
- Committee for Digital Transformation - Union of Employers of Montenegro;
- Committee for Information and Communication Technologies - Council of Foreign Investors in Montenegro;
- Society of Informatics of Montenegro;
- ICT Cortex Cluster;
- Montenegrin IT cluster;
- CANU.

Key Challenges, Problems and Findings

In order to create clear goals and activities that will help in the realisation of these goals, in the process of implementing digital transformation, it is necessary to establish quality and efficient coordination of activities at different interconnected and hierarchical levels, as follows:

- **Public-social level** where interests and suggestions from all key sectors of society are collected and considered - business sector, non-governmental organisations, academia and public administration (the so-called Digital Coalition). At this level, within the coordinating body, joint solutions and recommendations are harmonised and accepted for all sectors involved in this process.
- **Sectoral level**, responsible for leading and coordinating digital development and designing solutions in individual sectors (public administration and local self-government, business sector, NGOs and academia). At the sector level, the decisions of the coordinating body can also be binding, i.e., part of the formal decision-making process (e.g. obtaining the consent of this body for all decisions on Government investments).
- **Organisational level**, especially for larger and more complex organisations that have a complex internal structure (so-called silos). Coordination at this level aims to achieve internal coherence in the transformation processes in individual (large) organisations, define the roles of participants responsible for digital transformation within the organisation and increase their strategic importance.

Design of services and electronic services

Montenegro's strategic goals in the field of information and communication technologies (ICT) are identical to the goals set by the Digital Agenda 2020 for Europe[35] and the vision of the Gigabit Society by 2025[36].

One of the most important preconditions for the development of the digital society is the existence of political will as a driver of change. In that sense, with the existence of a clear political will and the so-called eLeader at the highest level of management, the Government is recognised (with the cooperation of all actors in society) as the main driver and regulator of digital society development. Recognising the importance of developing a digital society at the highest level in a system, with all the benefits it will bring to a society, its development will depend on specific activities translated into laws and regulations, but also strategies with clear goals and tasks to support these initiatives.

The development of e-government and digital society largely depends on the normative infrastructure. The special goals of legal regulation are to open the space for more intensive application of electronic business by legal regulation of this matter, to build trust of the general public when it comes to the use and exchange of electronic documents, use of trust services in electronic business but also to achieve competitiveness in world markets. These laws are equally important for citizens, the economy, state administration, local self-government and other entities, and their application enables progress in the international standing and activities.

Realising the need to create also the normative preconditions for the effective implementation of the digital transformation process, the following laws, which regulate these issues, have been adopted so far:

- Law on Electronic Government (Official Gazette of Montenegro, No. 72/19) - One of the fundamental reasons for the adoption of the Law on Electronic Government is to further regulate the field of electronic government in Montenegro in accordance with its actual and projected needs, both in terms of development needs and in accordance with the requirements of international integration processes. This Law provides for the possibility of communication with the Government in electronic format, obliges state bodies to provide e-government services through a single information system and to use a single system for electronic data exchange, and also provides for a meta-register to review electronic registers. The law also envisages the formation of a coordinating body, i.e., the Council for Electronic Government, which has the task of coordinating, synchronising and directing the activities for the development of electronic services "horizontally" in state administration bodies. In addition, the Law on Electronic Administration prescribes the obligation to create a **catalogue of electronic services** and publish

[35] https://www.europarl.europa.eu/factsheets/en/sheet/64/digital-agenda-for-europe

[36] https://www.europarl.europa.eu/doceo/document/A-8-2017-0184_HR.html

them on the websites of certain public institutions. In the absence of a catalogue, a gap has been identified when it comes to awareness and digital awareness of available e-services. Citizens are not informed in one place about the services provided by the administration, conditions and procedures for exercising their rights and fulfilling obligations. MPADSM has already started activities on the creation of a comprehensive catalogue of services in consultation with the European Commission under the ISA2 programme.

- **The Law on Administrative Procedure** (Official Gazette of Montenegro, No. 56/14, 20/15, 40/16 and 37/17) emphasised the need for public administration to adapt to changes in society, including the use of ICT. The Law on General Administrative Procedure is in line with the EU principles of good public administration and contains provisions on electronic communications, the single principle and the once-only principle. As this law introduced official responsibility for the exchange of information, there is now a legal obligation. However, this law does not require the use of a specific platform to exchange or share information electronically. The infrastructure for electronic information exchange is not yet fully established, although the work is under way. In practice, data exchange is still often carried out in the traditional way - on paper or in physical data storage - that involves the risk of data being compromised or lost.

Other key legal acts include:

- **Law on Electronic Document** (Official Gazette of Montenegro, No. 5/08 and 40/11) which regulates the use of electronic documents so that an electronic document cannot be challenged for validity, probative value or written form just because it is in electronic form and which introduces digitisation of paper documents, as well as certification of digitalised documents by entities prescribed by the law governing the certification of signatures, manuscripts and transcripts and competent authorities in terms of the Law on Electronic Document;
- **Law on Electronic Identification and Electronic Signature** (Official Gazette of Montenegro, No. 72/19), which continued the process of developing the legal framework necessary for the development of electronic business in Montenegro and the Rulebook on Open Data (Official Gazette of Montenegro), No. 53/18) which envisages the manner of publishing information as open data;
- **Rulebook on eID**;
- **Law on Information Security** (Official Gazette of Montenegro, No. 14/10 and 40/16);
- **Decree on Information Security Measures** (Official Gazette of Montenegro, No. 58/10 and 55/15) and
- **Law on Personal Data Protection** (Official Gazette of Montenegro, No. 79/08, 70/09, 44/12 and 22/17).

With the introduction of the **Law on Electronic Identification and Electronic Signature** as well as the **Law on Electronic Document**, a big step forward has already been made when it comes to adapting the legal framework for the needs of digital transformation of society. Under the two laws, qualified electronic

signatures and handwritten signatures are fully equated, allowing all transactions to be completely relocated to digital channels. However, how much this opportunity will be used depends primarily on the actual use of qualified electronic signatures.

Thus, the four laws of special regulations, together with the accompanying secondary legislations, achieve their basic goal, which is to establish the basic legal infrastructure necessary for digital transformation, namely:

- By adopting the proposal of the **Law on Electronic Document**, this legal framework will be further improved in order to harmonise the current inconsistencies with the **Law on Electronic Identification and Electronic Signature** and to accelerate the development of digitalisation.
- Adoption of draft regulations that would enable more efficient exchange of data between entities within the **Law on Electronic Government**
- Adoption of proposals for amending the **Law on Administrative Procedure.**

The United Nations Development Programme in Montenegro (UNDP) is implementing the project **Accelerating Digital Governance**. The main goal of this project is to support the transformation of digital governance in Montenegro in order to improve institutional resilience and increase trust in institutions. The main goal of this project is the need to support the transition of public administration in Montenegro to adaptive, efficient and open governance that puts human development at the centre of digital transformation.

In the process of digital transformation, it is important to regulate the issue of gender equality, i.e., to enable everyone to use public services under equal conditions, but also to create preconditions for planning and adopting public policies with the application of gender equality principles. A survey conducted by Ipsos Strategic Marketing for the office of the United Nations Development Programme in Montenegro (UNDP Montenegro) regarding the attitudes and perceptions of public administration employees and the evaluation of the application of gender equality principle in public government institutions[37], concluded that there is regulatory framework in Montenegro that regulates the field of gender equality and creates preconditions for the integration of the gender aspect into public policies and capacities of institutions, but that it is not sufficiently developed and functionally usable. The same report states that the institutional mechanisms themselves are not strong enough and do not have sufficient capacity to adequately implement and monitor policies in this area.

These results are confirmed by the research *Assessment of the need for training of public administration employees* conducted by the Damar agency, with the support of the UNDP office in Montenegro in June 2021. According to this research, 63.8% of public administration employees always apply the principles of gender equality when creating services, as well as strategic acts and other documents. When it comes to

37

https://www.me.undp.org/content/dam/montenegro/docs/publications/ISTRAZIVANJE%20Stavovi%20i%20percepcije%20zaposlenih%20u%20javnoj%20upravi%20o%20rodnoj%20ravnopravnosti.pdf

e-services, almost 2/3 of employees do not collect data on the sex/gender of service users when providing services, which may lead to the conclusion that they do not rely on data when planning important acts, i.e., do not make decisions based on data, but experience and intuition. Based on foregoing, it is clear that it is necessary to genderise existing and future electronic services, which would be especially important for conducting gender analysis in these areas, but also further gendering of public policies.

As part of the EU accession process, Montenegro has developed and adopted the Public Administration Reform Strategy 2016-2020. This strategy covers the entire system of public administration, including state administration and local self-governments as well as organisations with public authority.

This Situation Analysis includes a comprehensive list of recommendations for normative changes that will be an integral part of the Montenegro Digital Transformation Strategy 2022-2026.

The Government's medium-term programme goals include creating conditions for the dynamic development of new generation networks, continuous improvement of e-services and wide application of information and communication technology (ICT) in public administration, economic activities and society as a whole. In order to define realistically achievable goals, it is necessary to analyse the level of digital development of Montenegro. Such and similar research is periodically conducted and published by various international institutions and organisations. For example, according to the United Nations (UN eGovernment Survey 2020)[38], Montenegro ranks 75th on the list of global eGovernment development (out of 193 countries) when it comes to the UN eGovernment Development Index [39] for 2020 and recorded a drop of 17 places from the previous survey conducted in 2018 (Table 3).

eGovernment Development Index	2020	2018	2016	2014	2012	2010
Montenegro ranking	75	58	47	45	60	100

TABLE 3. MONTENEGRO'S RANKING ACCORDING TO THE E-GOVERNMENT DEVELOPMENT INDEX (2010-2020)

To assess the development of e-government infrastructure, through the establishment of new electronic services on the euprava.me portal and other portals, the optimal indicator of performance would be the online services index (OSI). This index measures the coverage and quality of electronic services and it is obtained by looking at the national e-government portal, as well as all websites of the most relevant ministries that provide electronic services or information about them.

According to the same United Nations survey, the performance of the Electronic Services Index shows that Montenegro has not only results that are significantly below the sub region average (southern

[38] https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/114-Montenegro

[39] The e-Government Development Index (EDGI) is a composite indicator consisting of three indices: the Online Service Index (OSI), the Telecommunication Index (TI), and the Human Capital Index (HCI).

Europe), but also below the world average (in Montenegro this index is 54.12%, while the world average is 56.2%[40]).

When it comes to the e-participation index[41], which assesses the use of electronic services by which public administration provides information to citizens, interaction with stakeholders, i.e., with all those who have an interest in accessing these services online and the participation of entities in the decision-making process and the creation of policies and regulations, the status of Montenegro has also changed. In 2020, the position of Montenegro according to this indicator was significantly lower compared to 2016, when the Digital Society Development Strategy 2016-2020 came into force (Montenegro moved from 17th place in 2016 to 100th place in 2020 year, Table 4).

Electronic Participation Index	2020	2018	2016	2014	2012	2010
Montenegro ranking	100	64	17	49	60	100

TABLE 4. RANKING OF MONTENEGRO ACCORDING TO THE ELECTRONIC PARTICIPATION INDEX (2010-2020)

Similar research into digital development is being conducted by the OECD. The report Competitiveness in Southeast Europe 2021[42] shows that in 2018 Montenegro did not have a list of fully digital services provided in the public sector (along with 50% of all economies in the Western Balkans). This report shows the relative progress of Montenegro since 2018 in the field of digital government and emphasises the importance of continuing reforms to create high-quality fully transactional e-services as well as providing sufficient funds to implement action plans.

It is important to emphasise that these studies actually measure the relative progress of countries in the process of improving e-government, so that the drop in Montenegro's ranking on the UN international list is the result of reforms being implemented or were implemented by other countries. So, despite the existing reform processes in Montenegro, a number of other countries have achieved better results and progress, and thus a ranking on this list, so it is necessary to plan measures in the future Strategy to change this trend in the opposite direction.

In support of these results, the data show that, although there are 523 e-services on the e-government portal in Montenegro, only 157 e-services have been developed to level 3 (online filling and downloading of forms), and the only available service that has been developed to level 4 (which provides for full interoperability of registers) is a service that allows online enrolment of children in schools and kindergartens, as well as online enrolment of students in the first year of college (these services were

[40] Digital Maturity Assessment of Montenegro; 2021; E-gov Academy

[41] https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/114-Montenegro

[42] OECD (2021), Competitiveness in South East Europe 2021: A Policy Outlook, Competitiveness and Private Sector Development, OECD Publishing, Paris, https://doi.org/10.1787/dcbc2ea9-en.

launched in May 2020). Since there is no level five service at all (full online service), the current situation indicates a lack of level 4 and 5 services in the existing Montenegrin e-government system. Electronic tax filing has been mandatory since 2017 and it is done through the Revenue and Customs Administration portal.[43]

Given the broader framework for e-services development, it is noticeable that it is difficult to determine sufficiently precise indicators of the development of e-government at all levels. The reason, inter alia, lies in **the lack of a systematic and sufficiently efficient mechanism that would give the Ministry of Public Administration, Digital Society and Media (MPADSM) the authority to collect data from other institutions on the level of development of e-government**. Namely, although MPADSM collects and distributes data on e-government development to all relevant international organisations engaged in e-government development research, there is still no clearly defined obligation of institutions to submit data on e-services to the Ministry. In this way, there is no complete and comprehensive picture of the level of development of e-services, which makes it very difficult to determine the real state of the problem, as well as examples of good practice.

Public Administration Services

The e-government portal, which has over 80,000 users, was implemented in 2011 and lags behind modern trends in terms of technology and good user experience. Although there is an evident increase in the number of available services on the e-government portal, according to a survey conducted by the Institute Alternative within the WEBER project[44] only a third of Montenegrin citizens are aware that services provided by the Montenegrin Government are available in electronic format.

On the e-government portal[45], which is recognised as the central point for electronic services (e-services) of state administration bodies, the number of e-services as of December 31, 2020 was 575, and services were provided by 50 institutions. Out of the total number of services, 187 are electronic and 388 are informative. During 2021, there was a slight decline in the number of electronic services and by the relevant date (December 2021), it was 523. Table 5 provides an overview of services by year.

[43] UNDP (2020); Towards a Digital Future for All: National Human Development Report 2020, page 91

[44] https://institut-alternativa.org/

[45] www.euprava.me

Year	Total services	Number of institutions	Electronic services	Informative services	Legal entities	Natural persons	Public administration
2016	192	30	110	82	73	97	22
2017	249	32	136	113	92	135	22
2018	563	50	175	388	344	196	23
2019	585	51	179	406	358	205	22
2020	575	50	187	388	342	211	22
Dec. 2021	523	44	156	367	321	181	20

TABLE 5. OVERVIEW OF E-SERVICES BY YEAR AND TYPE (ELECTRONIC OR INFORMATIVE)

The portal also contains the Register of Licenses, which includes 355 licenses issued by 26 institutions. Out of that number, 10 licenses are intended for state administration bodies, 295 for legal entities and 50 for natural persons. The largest number of licenses available on the e-government portal, if viewed from the aspect of sophistication of services, are licenses developed to level 1 (185), followed by licenses developed to level 2 (145) while 25 licenses were developed to level 3.

The basic framework for assessing the state of e-services can be applied to public services, resulting in the following stages of maturity:

- Level 1 - data on services exist in electronic form (so-called informative level)
- Level 2 - one-way communication is enabled, i.e. forms can be downloaded from the internet, filled in manually and submitted
- Level 3 - two-way communication is enabled, i.e., forms can be filled in and submitted online and the public service will provide the service to an authorised user
- Level 4 - a transaction can be realised, i.e., services can be provided entirely on the Internet, by submitting completed forms or data for processing electronically; decisions of state authorities are also delivered electronically
- Level 5 - personalised service has been developed, which means that the entire service can be performed online, automatically and proactively.

In light of the outbreak of the COVID-19 pandemic and its far-reaching impact, access to public services has been made more difficult for citizens and businesses due to the introduction of social distancing measures, travel restrictions and other restrictive measures. The crisis has highlighted the importance of technology, but also the key role of an efficient, inclusive and accountable government. At the beginning

of 2021, activities began on the project *E-services and Digital Infrastructure as Covid-19 Response Measure*[46] aiming to accelerate the digital transformation of public administration in Montenegro with the development of new and upgrading existing platforms and complex software systems as well as complex electronic services that meet, above all, the needs of citizens and the economy.

The goal is to establish an efficient and sustainable integrated system of simplified electronic procedures for citizens and the economy, which will primarily be realised through the implementation of at least 10 electronic services for citizens and the economy. The project envisages the establishment of a single e-government portal with the implementation of at least 10 priority services, namely: Application for the issuance of ID cards and passports, Submission of applications for issuance (renewal) of driver's license, Application for vehicle registration, e-Student, Application for employment in public administration , Generic e-service for applying for professional exams (taking the professional exam for work in state bodies with a university degree / high school diploma, taking the professional exam for work in the field of sports, taking the professional exam for notaries, taking the professional exam for auditors, etc.), Electronic service in the field of spatial planning, e-Registration of NGOs, e-Business, Electronic registration and deregistration of employees, e-Contributions, Childbirth allowance - related to e-registration of newborns, e-enrolment in students dormitories, Application for registration and entry of agricultural holding and premium. In order for e-government to be transparent and accessible to everyone, one of the important elements is the involvement of stakeholders. That is why the **eParticipation** system, which ensures proactive participation of citizens in social processes and decision-making important for their lives and the life of the community, has been developed within the e-government portal as a sub portal. The final Report on the Information Society Strategy 2016-2020 states that the number of publications on the eParticipation portal has grown in previous years. Thus, in 2015 there were 62 announcements of public calls, while in 2020 this number was 207, and in 2021 until the relevant date (December 2021) 297 public calls were published (public announcements, calls for public debate, calls for consultations, etc.). This data speaks in favour of the fact that the awareness of citizens about the possibilities of e-participation has increased and that they are also convinced of the efficiency of this service through examples of good practice.

When it comes to transparency and involvement in public policy-making processes, an important role is played by the portal **"Voice of Citizens - ePetitions"**, which allows the public to influence the policy-making process by submitting electronic petitions to the Government of Montenegro. The project represents a step towards improving participatory democracy, the Government's openness to dialogue and partnership with civil society and active public participation in the policy-making process. The innovated portal, adapted to mobile devices, that meets the requirements related to accessibility, was published and launched in 2021. It is currently functioning at the central level, but technical preconditions

[46] The project is funded by the EU and implemented by UNDP in cooperation with the Ministry of Public Administration, Digital Society and Media; Project activities began in January 2021 and will last until January 2023.

have been created for expansion to the local level. Since the publication of the innovated portal, 61 petitions have been submitted, for which over 15,000 citizens voted.

In addition to creating conditions for citizen involvement, an unavoidable part of e-government is cooperation with the economy and the business sector and creating conditions for more efficient work. In that sense, the **eFirma** portal was developed and published, this is a system for submitting electronic applications for registration in the Central Register of Business Entities (CRPS) of Montenegro, as well as submitting requests for issuing documentation from the register. The portal is part of the integrated information system of the Tax Administration of Montenegro and is connected to the Central Registry system.

The Open Government Partnership (OGP), a voluntary international initiative, launched in 2011 and joined by Montenegro in 2012, demonstrates the importance the Government of Montenegro attaches to promoting public administration transparency, strengthening civil society and the role of citizens in public policy making as well as the use of new technologies in governance.

Since the penetration of e-services largely depends on the user experience, in 2019, MPADSM, in cooperation with UNDP and IPSOS Strategic Marketing[47], conducted a survey on the quality and satisfaction of citizens with e-services. The results showed that 82.76% of users believe that submitting an electronic request through the portal facilitated the process of obtaining the requested document. In 2020, the measurement of satisfaction with electronic services was performed through additional functionality on the e-government portal, which means that users can give a positive ("Like") or negative ("I do not like") rating of the service provided by electronic way. Users rated 38 e-services in total, and the total number of positive reviews was 4182, while 55 of them gave a negative rating, which represents a percentage of 98.70% of satisfied users who used e-services on the portal.

The key findings from this study were:

- Over half of the citizens who learned about public administration e-services have not used any of them in the previous two years, about 20% state that they have used them infrequently, while the same number have used them occasionally or frequently.

- More than three quarters of Montenegrin citizens are not informed about public administration e-services.

- Unlike citizens, companies are more informed when it comes to the availability and use of e-government services - close to 90% of entrepreneurs estimate that their company is mostly or fully informed about e-services intended for the economy

[47] https://www.me.undp.org/content/dam/montenegro/docs/publications/NHDR/NHDR2018/E-services%20survey_MNE.pdf

- Over half of citizens who learned about public administrations e-services have not used none of them during two previous years, around 20% states they used them rarely, while the same percentage used them from time to time or frequently.

The Information Society Development Strategy 2016-2020 defined strategic priorities in the field of e-government. The goal was that by 2020, 50% of citizens and 30% of legal entities would be users of e-services. According to the final Report on Implementation of Information Society Development Strategy 2016-2020, the number of legal entities, using e-services at the end of 2020 was 45%.

The information gathered in interviews and working group meetings confirms the observation made in the *National Report and Plan for Improving the Digital Agenda in Montenegro*[48] implemented by the NGO "35mm" and points to the conclusion that the general legislative framework for e-government is at high level compared to other countries in the region. One of the biggest challenges is the **disparity between law and practice and the relatively low awareness of public institutions about the value of providing e-services compared to traditional (paper) services.**

In addition, the improvement of e-services for the needs of the economy (such as improving the process of registration of business entities) was recognised as an important challenge. Based on the analysis of e-services in 2020, a working group of representatives of all relevant institutions was formed, coordinated by the Competitiveness Council, tasked to improve the process of registration of business entities. The next steps include the establishment of an electronic data exchange between the Official Journal and the Revenue and Customs Administration. The Revenue and Customs Administration will ensure the development of an application for electronic registration of companies (establishment, change of data and closure of business entities), which includes adjusting the system to the provisions of the new **Law on Enterprises**.

The Ministry of Public Administration, Digital Society and Media has prepared an **Analysis of State of Electronic Services with Proposed Measures for Improvement** (for the first and second quarters of 2020). The analysis contains key activities and information gathered from other institutions in order to create the most comprehensive picture in this field. One of the key activities in the coming period, which will be covered by the Public Administration Reform Strategy, is the development of a new, technologically and conceptually advanced eGovernment portal.

The Montenegro Information Society Development Strategy 2016-2020 (ISDS) defined activities for the development of **e-health** in Montenegro. The strategy also defined the implementation of the Integrated Health Information System (IHIS), in accordance with previous strategic documents in this field and future plans for the development of the health system. Implementing the activities covered by ISDS, the Strategy for Developing Integrated Health Information System was adopted in 2018, with goals directed at establishing an efficient and stable health information system management system. In addition, the

[48] https://nvo35mm.me/publications/download/36

document defines the competencies of management bodies and the establishment of an efficient and functional reporting system for certain data sets per relevant institutions that will use generated health information more efficiently and effectively to plan development, reporting, treatment, monitoring, assessment and prevention of disease (Final Report on Implementation of Information Society Development Strategy 2016-2020, 2021). The obligation to keep records of medical data in paper and digital form, as well as medical documentation, is prescribed by the laws of Montenegro.

In that sense, e-services for citizens in the field of health and health care provided by the Health Insurance Fund have been developed. The services are available on the eHealth portal (www.ezdravlje.me) and include the following:

- ePharmacy - an electronic service intended for citizens (patients), developed in order to provide information on the availability of medicines in all pharmacies that have a contract with the Health Insurance Fund

- eLabResults - an electronic service that allows patients to see the results of biochemical laboratory analyses via the Internet.

- eOrdering - an electronic service intended for the Fund's insured persons, who are registered with chosen doctors in health centres. This service provides electronic ordering services of the following:
    - electronic prescriptions (therapies) for chronic patients,
    - reports for the calculation of salary compensation (remittances) during temporary incapacity for work (sick leave) and only for sick leave approved by the First Instance Medical Commission of the Fund,
    - certificates issued by selected doctors (currently 2 types of certificates issued by the selected doctor for children: Justification of absence from kindergarten and Proving the ability to attend physical education),
    - sick leave (extension of opened sick leave), according to temporary measures and decisions of the competent body for combating the spread of COVID-19 infection (currently deactivated).
- eInsurance - an electronic service that allows (insured) citizens to inspect the status of their health insurance.
- ePrescription - an electronic service that allows patients to see the prescribed and implemented prescriptions with the use of advanced technologies and devices (PC, Smartphone, Tablets, etc.).
- eSchedule - online scheduling service for chosen doctors in health centres (chosen doctor for adults, chosen doctor for women and chosen doctor for children).
- Public health institutions - a service that provides a list with contact information of all public health institutions in the health system of Montenegro.
- Medical Commissions - a service that provides an overview of medical commissions by cities in Montenegro.

- Medicines - a service that displays a list of prescription drugs and drugs used in health facilities.
- Private health care institutions - a service that provides a list with contact information of private health care institutions with which the Fund has concluded a Service Provision Agreement.

In 2021, the eHealth portal provides 9 services, which is an increase compared to 2020 by 5 services (Digital Agenda Observatory, 2020[49], UNDP).

In the period between February and May 2020, a high increase in the use of electronic services was recorded on the eHealth portal. It is a period of pandemic and blockade caused by the COVID-19 virus, but afterwards, as in almost all electronic services, there was a decline in use almost to the level it was before the pandemic.

With the exception of the COVID-19 pandemic period, the analysis shows that citizens mostly use the eSchedule service, while all other services are used significantly less. The least used service by citizens is eInsurance. The results of e-services testing (National Report and Plan for Improving Digital Agenda of Montenegro, 2021[50]) show problems in the eSchedule service - citizens do not receive notifications if there is a change in the doctor's schedule after online appointments, so it often happens that despite the online appointment, citizens are waiting. The application has a problem due to the inconsistency of doctor's shifts with scheduling deadlines, as well as in cases when the doctor goes on sick leave or similar, which contributes to citizens gaining distrust in online services.

e-Business

During the period of implementation of the Information Society Development Strategy 2016-2020 in the field of e-Business, activities were carried out aimed at promoting and improving business in the digital environment, in order to transform digitally the Montenegrin economy. Within this strategic goal, **four operational goals** have been defined, as follows**:**

- Raising awareness of the importance and benefits of e-Business,
- Improving the legislative framework - in terms of harmonisation of legislation in order to fully implement e-Business,
- Encourage companies to switch to e-Business, and
- Improving e-Business with 8 activities that included 14 sub-activities.

The holder of activities in this area was the Chamber of Commerce of Montenegro, which in 2020 conducted a survey on barriers to e-Business, the results of which were submitted to the Competitiveness Council. In this way, an initiative was launched to harmonise the legislative framework in terms of harmonisation of legislation in order to implement fully e-Business. In the previous period, the largest number of activities was related to raising awareness of the possibilities of e-Business, a large number of

[49] https://metamorphosis.org.mk/wp-content/themes/metamorphosis/download.php?id=27831

[50] https://nvo35mm.me/publications/download/36

round tables, workshops, promotions and the like were held, on the topic of e-Business, e-Commerce, Cloud services, open data, Internet security, etc. However, despite all the activities, the expected results were not achieved.

Representatives of public administration, academia, business associations and IT sector agree that at the moment the digitalisation of business is a priority factor in economic growth, while, on the other hand, there is agreement among them that the digitalisation of the economy in Montenegro is mostly low level (Ipsos Public Affairs, ICT as Driver of Further Development of Montenegro[51] research conducted for the Office of the United Nations Development Programme). The assessments of the representatives of the companies on the state of digital skills of the employees in their companies confirm the general views on the problem of digital literacy on the labour market. Just over a third of company representatives, 35%, said that employees working in jobs where digital skills are needed have a high enough level of skills to do their job fully efficiently, while in 19% of companies' digital literacy of employees is rated as very good. Research indicates that the reasons for this condition are:

1. Lack of awareness of entrepreneurs about the importance of digitalisation - among entrepreneurs there is still no complete understanding of the benefits of digitalisation. In a large number, primarily small companies, investing in information and communication technologies is still seen as an additional cost and not as an investment to improve business.

2. Financial reasons - digitalisation requires investments that companies, especially small ones, are not ready for.

However, when considering the factors assessed as major obstacles by the IT sector, those related to the problem of human resources come to the fore, followed by the lack of financial opportunities for companies to invest in a higher level of business digitalisation. Only one in four respondents sees the lack of awareness of business people as a major obstacle.

The new regulatory framework, primarily the Law on Fiscalisation of Trade in Products and Services (Official Gazette of Montenegro, No. 46/19, 73/19 and 8/21), which has been in force since January 2021, along the forthcoming changes already being worked on (electronic identification) will enable the process of selling services, activation of additional and new services, delivery of invoices and payments to be digitalised from start to finish.

In the 2020 White Paper[52] the Foreign Investors Council defined key recommendations for the full realisation of digital business:

1. **Digital communication with users - without counters / intermediaries** - According to the existing Law on Electronic Communications, electronic communication operators regulate their mutual

[51] www.undp.org/content/dam/montenegro/docs/publications/NHDR/NHDR2018/UNDP_Report_ICT_3.10.pdf

[52] www.mfic.me/activities/white-book

rights and obligations with the user in a written contract. Appropriate changes to the existing legal solution should provide the possibility of paperless digital interaction based on the use of eID (contained in the new ID card). This would enable the end users to have significantly simplified and facilitated a current slow and complicated procedure of waiting in lines for signing contracts, changing packages, shopping, etc., which would also contribute to the popularisation of the use of eID. In addition, electronic methods of submitting invoices (via SMS, sending a link to download invoices, downloading invoices from the operator's mobile application, etc.) must have the same treatment as submitting invoices in paper form. Although the Law on Electronic Communications is not within the competence of the Ministry of Public Administration, Digital Society and Media, amendments to this Law are necessary for the full realisation of the digital way of doing business.

2. **Digital communication with public institutions** – Considering the already mentioned legal regulatory framework from the Law on Electronic Identification and Electronic Signature, it is necessary, through the e-government portal, to download the necessary application documents for various public tenders, such as certificates, extracts, etc. which would of course be electronically signed by the appropriate authority in accordance with the Law on Electronic Document. Scanning is time consuming and creates unnecessary bureaucracy and paperwork.

   Filling applications for network building and maintenance would be another service that needs to be made possible online.

3. **Exchange of data on the National Identification Number** - The National Identification Number (NIN), which was introduced at the same time as the new ID cards, solves the problem that service providers have in terms of identifying their customers, and on the other hand ensures personal data protection. This is not the case with UIN because, in addition, UIN is not a data that must be registered. However, two problems have been identified in this process:
   - Citizens' awareness what is their NIN (national identification number) – because it is not printed on the ID card;
   - Citizens' awareness of their NIB (national identification number) - as it is not printed on the ID card;
   - Most systems in Montenegro (public administration bodies, banks, etc.) are still based on the UIN as the only immutable data that uniquely identifies a person. Organising the exchange of data with the Ministry of the Interior (MoI) would enable companies to automatically obtain data on NIB users by pairing with data from current versions of the ID card.

When it comes to the services of eBanking, for the full implementation and support of the development of e-Business, certain regulatory and technological factors are needed, among which, as the most important, the following stand out:

- Regulatory changes to support customer identification and AML procedures through network channels (e.g. video calling);

- Regulatory changes that support the signing of a loan agreement via e-banking - without the use of a qualified digital signature;
- Implementation of eID and trust services in the country (MobileID and digital signatures);
- Extension of the work of the CBM's Credit Bureau in a way that is available 24/7 (currently available from 8:00 am to 8:00 pm, which conditions the availability of online services when it comes to lending);
- The Revenue Administration of Montenegro and the Pension and Disability Insurance Fund to make their data registers available (so that banks and other legal entities can integrate their systems).

The Final Report on Implementation of Information Society Development Strategy 2016-2020, prepared by MPADSM, states that the biggest challenges in achieving operational goals were insufficient interest of stakeholders (both competent institutions and the economy, from which significant feedback is obtained) and insufficient cooperation of competent institutions, in terms of initiating the realisation of set goals. It was noticed that employees who are IT professions are mainly delegated to attend events organised in order to raise awareness of the importance of improving awareness of the importance of digital transformation, as well as workshops to improve digital competencies. There is still no critical mass of digitally aware leaders, who would initiate a more intensive digital transformation of the Montenegrin economy (this refers to the non-ICT sector). The examples of institutions that provided eServices for the submission of documents during the COVID-19 pandemic, and, after the measures expired, requested that the documents be subsequently submitted in paper form, are discouraging.

All the foregoing points to the need to design a different campaign to promote the concepts of digital transformation (events themselves do not seem to be enough) in all segments of society as well as the actual implementation of the legislative framework in this field. In this regard, it is useful to study the experiences and initiatives of other countries that have already gone through the initial stages of digital transformation and apply good practice in Montenegro.

e-Education

The strategic goal of e-Education in the previous five-year period was realised within two operational objectives:

- Improving the conditions for raising the level of application of ICT in teaching, providing conditions for online collaboration of teachers, improving the conditions for using the information system of education in regional institutions and
- Support for increasing the application of ICT in teaching as well as in the daily work of employees in educational institutions.

During 2020, the installation of the local computer network began in all primary school facilities where teaching is held. Procurement of computer equipment, as well as equipment for Data Centre and Disaster Recovery was not realised due to the procedures of the European Investment Bank, but the funds were

approved and the tender documentation was prepared. Teacher trainings for the use of the school portal (www.skolskiportal.edu.me), as well as Oracle trainings have been fully implemented. The British Council, in the framework of the three-year project 21st Century Schools[53]) provided funding for teacher education for the use of microbit devices in teaching. Despite the fact that the online course micro:bit Basics for Teachers![54], is available to all teachers, microbit devices are given only to a certain number of primary schools that are defined within the project, so the application is limited. The SELFIE [55] self-evaluation tool was implemented in all primary and high schools. The concept of Digital School based on Microsoft Teams application was established in order to organise and implement all school activities online. The design of the concept Digital School was supported by the UNICEF Office in Montenegro. They also supported the training of 4,200 employees in educational institutions during 2020 for the application of digital tools to implement online teaching.

A model of online communication between all stakeholders (teachers, administration, children and parents), was established, the possibility of planning educational work, the implementation of online teaching, sharing educational content with students, creating online quizzes, etc.

The information system of education has been significantly improved in the area of early identification of children at risk of dropping out of school, monitoring and prevention of violence, digitalisation of the process of applying for the Baccalaureate and professional exams and returning grades by the Examination Centre and informing schools and parents through applications.

In 2020, with the support of UNDP and UNICEF, electronic services were created for enrolling children in preschool institutions, enrolling students in primary, secondary and music schools, as well as enrolling students in the first year of undergraduate studies at the University of Montenegro. When it comes to the number of service users, the data show the following:

- Submission of applications for enrolment of children in preschool institutions was used by 6,670 users (men: 3,468, women: 3,202);
- Submission of applications for enrolment of children in the first grade of primary school (with electronic scheduling of interviews in the pedagogical and psychological service) was used by 6,629 users (men: 3,454, women: 3,175);
- Submission of applications for enrolment of children in the first grade of high school (with a system of grading marks and success, as well as generating a ranking list) was used by 5,967 users (men: 3,027, women: 2,940).

In 2021, the online service of student enrolment for the first year of college (at the faculties of the University of Montenegro) was created, which was used by 3,322 users (men: 1,442, women: 1,880). With

[53] https://www.britishcouncil.me/en/programmes/education/21st-century-schools

[54] https://microbit.britishcouncil.org/bs-sr

[55] https://ec.europa.eu/education/schools-go-digital/about-selfie_hr

the realisation of these services and during everyday processes, the need for issuing certificates for about 20,000 users per month has decreased. In addition, certificates do not have to be attached during the implementation of these services (birth certificate, social welfare certificate, etc.).

The created new portal for parents (www.dnevnik.edu.me) provides parents with the opportunity to enter the Education Information System in terms of grades, absences, behaviour, external tests, etc. A mobile application for Android and iOS, eDnevnikME, was created for the first time. During 2020, this application was used by 68,859 users, and during the COVID-19 pandemic, the application was used as the main way to inform parents about children's achievements, obtaining information from the homeroom teachers, but also from the Ministry of Education, Science, Culture and Sports.

One of the most used services during 2020 and 2021 was the #UčiDoma (#LearnAtHome) platform. The Ministry of Education, Science, Culture and Sports has prepared and implemented the project #UčiDoma, within which classes were filmed and broadcast on TVCG and MNE SPORT TV channels according to the programme scheme published on the school portal www.dnevnik.edu.me. The teaching content was also published on the YouTube channel UčiDoma as well as on the portal www.ucidoma.me.

e-Inclusion

By ratifying the UN Convention on the Rights of Persons with Disabilities, the state of Montenegro has committed itself to ensuring unhindered access to information and communication technologies for persons with disabilities, in order to eliminate barriers to access to information, including the Internet. The Montenegro Information Society Development Strategy until 2020, as well as EU directives, recognises the strengthening of the presence of persons with disabilities in the process of building a digital society in Montenegro. In this regard, the Ministry of Public Administration, Digital Society and Media in March 2019 signed a Memorandum of Cooperation with the Association of the Blind of Montenegro in order to monitor e-accessibility standards and their implementation. The strategic goal of eInclusion in the previous period was aimed at educating and raising awareness of e-accessibility in public administration.

In 2019, the Ministry of Public Administration, Digital Society and Media published the third version of the Guidelines for Development and Management of Public Administration Internet Presentations, within which recommendations were given for creating accessible websites of institutions. In addition, in the same year, the first version of the Guidelines for Standardisation of Local Self-Government Units' websites was published. MPADSM, in cooperation with NGOs, organised round tables and other gatherings aimed at promoting the concept of e-accessibility and worked on creating web content in accordance with e-accessibility standards. During 2020, the *Monitoring of Implementation of Electronic Documents Creation Guidelines* in accordance with e-accessibility standards was conducted, which was recognised by the Action Plan for the Implementation of the Open Government Partnership Initiative of Montenegro (2018-2020).

During 2020, a public procurement was prepared and conducted for the project Government Portal Development. The first phase for the development of the new Government Portal includes the websites

of ministries, in addition to the Government website. The new government web portal (GOV.ME) was launched in mid-May 2021 and meets e-accessibility standards in accordance with the Law on Electronic Government. A special section has been created to improve the accessibility of content with control of contrast, font size, text size, spacing, animation, visual guide for easier reading, highlighting links, compatibility with screen readers through page restructuring, special font that makes reading easier for people with dyslexia or visual impairment. Through the redesigned Government portal, services are available on all devices, from laptops to smart phones. In contrast, the eGovernment website still has an outdated design that does not meet the Guidelines for creating accessible pages.

In order to improve it further, it is necessary to redesign completely the e-government portal, primarily in terms of adaptation to users (the so-called User-Centred Design) with the application of accessibility guidelines. Through further promotion of the concept of e-accessibility in cooperation with NGOs, it is necessary to launch initiatives for redesign of websites of public information services, news agencies, educational institutions and local self-governments' websites.

In addition to this, it is planned to expand the Government portal (gov.me) to the websites of state administration bodies, so that in 2022, these sites will be harmonised with the Law on Electronic Government and the Rulebook on Accessibility Standards in the area of e-accessibility.

In order to increase further the accessibility of the Government Portal, ministries and state administration bodies, it is necessary to work on increasing the number of accessible documents that are published on the official websites. In this sense, it is necessary to conduct continuous training of public administration officials regarding the preparation and exchange of documents in an electronically readable format.

Infrastructure and data for e-services

Based on the available and analysed documentation, in recent years there has been visible progress in establishing basic information systems that are the basis for providing quality e-services and their full digitalisation. The platform of the Single Information System for Electronic Data Exchange (SISEDE) of the Government service, which is also called the Unified System of Electronic Data Exchange (USEDE), was put into operation at the end of 2018. The primary goal of this system is to provide communication between existing systems and faster exchange of information between citizens and government, enabling the provision of services electronically and automated exchange and use of large amounts of data from state registers. The basic function of a central, interoperable system is to provide institutions with a single communication platform for secure and reliable data exchange and thus provide a basis for quality and fast delivery of services. The following registers are currently connected to USEDE:

- Central Population Register,
- Central Register of Taxpayers and Insured Persons (Register of Taxpayers and Register of Employees),
- Central Register of Business Entities,

- Register of Education of Montenegro,
- Register of beneficiaries of material benefits,
- Register of Health Fund Insured Persons,
- Waste register.

In the USEDE part, called the Met register (records of registers kept by bodies recognised by the Law on e-Government), the following registers have been reported (but there is still no exchange between them, although all conditions are met by the system) from which in 2021 a significant flow of data is expected from the following registers:

- Register of criminal records of natural persons,
- Register of criminal records of legal entities,
- Criminal records of juvenile criminal sanctions,
- Register of fines and misdemeanour records,
- Real Estate Registry.

It is necessary to continue connecting all the most important registers that are in different information systems of different state administration bodies. It is one of the most important shared services, without which the modern development of electronic government and electronic services is not possible. First of all, because USEDE allows the user not to have to submit mandatory documents from other bodies, but this is done *ex officio* in accordance with the Law on Administrative Procedure.

The Electronic Document Management System (eDMS) is one of the key Government services that enable the improvement of business processes by gradually switching from paper to electronic form of document management. The goal of introducing eDMS in state administration bodies is to create a more efficient, high quality and transparent e-government. The system enables faster exchange of information, reduction of paperwork and greater security when storing documents. Electronic document management allows a precisely defined flow of the document from the moment of entry into the system, its processing by the user, the possibility of electronic signature, to its archiving, which means that the system monitors the entire life cycle of the document from creation to archiving. The advantage of this system is that, in addition to managing documents originally created in electronic form, it provides the ability to manage documents created in paper form, by digitalising them, which is recognised by new legal solutions.

eDMS has been established in 16 institutions[56], and it is fully used in nine of them, without any auxiliary records (internal delivery books, records, registers, etc.). Although the system supports the functionality of exchanging electronic documents between institutions, so far it has been used only for the purposes of records and exchange within individual institutions.

[56] Ministry of Ecology, Spatial Planning and Urbanism, Ministry of Economic Development, Ministry of Finance and Social Welfare, Ministry of Public Administration, Digital Society and Media, Ministry of Capital Investments, Ministry of Defence, Ministry of Agriculture, Forestry and Water Management, Ministry of Justice, Human and Minority Rights, Ministry Education, Science, Culture and Sports, Ministry of the Interior, Ministry of Foreign Affairs, Ministry of Health, Police Administration, Sports and Youth Administration, Personnel Administration, Protector of Property and Legal Interests

The General Secretariat of the Government and MPADSM has established a new **Planning and Reporting Information System**[57], which is a joint activity of the Public Administration Reform Strategy. The goal of this information system is to enable the simplest possible medium-term planning of the work of ministries and to lead to a better realisation of the strategic goals of the Government of Montenegro. In addition, its implementation will ensure that the Government priorities, planned in the medium-term work programme, are properly and adequately implemented at the ministries level. All officials in the General Secretariat of the Government and ministries have access to the information system for planning and reporting in accordance with the methodology for medium-term planning of ministries, which will harmonise planning at the Government level starting in ministries, but also improve the quality of reporting and efficiency.

The Public Administration Reform Strategy identifies the need to improve the existing e-government portal, established 10 years ago, both visually and technically and technologically. The establishment of the new portal envisages integration with shared e-government systems such as the electronic identification system, the system for collecting administrative fees and charges, etc., in order to enable the completion of electronic services and their sophistication at the highest level. The desired trend of MPADSM is to develop services at a high level of sophistication, which primarily provide end users to ensure that all communication with public administration is fully realised electronically.

The Ministry of Public Administration, Digital Society and Media, as the state administration body responsible for e-government and e-business, has launched the implementation of two information systems: **the system for electronic collection of administrative fees and the system for electronic identification and authentication**.

The Information System for Electronic User Identification (NS eID) aims to enable electronic identification, i.e., authentication and authorisation of users when using electronic services, while the **Information System for Collection of Administrative Fees (NS - NAT)** should enable electronic payment of public revenues. The goal of introducing the system is to eliminate the existing problems of public revenue collection by introducing a central control point through public revenue payment services with payment cards at the counters of state administration bodies and local self-government units as well as payment cards through the electronic services portal. The implementation of this system will achieve results that will greatly contribute to the monitoring and verifiability of all transactions related to the collection of public revenues, which will reduce the number of misuses identified in the previous period in the payment system.

As Montenegro continues to develop its own digital information infrastructure through which a secure level of data exchange on the Internet allows decentralised databases and information systems to communicate with each other to improve the use of e-services (delayed due to the COVID-19 pandemic),

[57] https://ispi.mju.gov.me/

it can draw lessons from Estonia's experience in maximizing data sharing and user-cantered design. (UNDP National Human Development Report, p. 91)[58.]

It is very important to keep in mind that modern solutions require an appropriate concept of infrastructure as support. The architecture of the digital infrastructure of the Government of Montenegro is based on the concept of cloud infrastructure at several levels. It includes government data, including basic state registers. This infrastructure supports the work of the Government, ministries and key public agencies in a secure environment within the Firewall with strong cyber security mechanisms. From this source, data for analytics, services for citizens and the economy, as well as the Open Data Portal are provided in a controlled manner in the part where the data can be open to the public.

Hybrid Cloud as a variant provides support to the wider public sector and local communities both in terms of application and data, and also establishes secure connections with the state cloud for reporting and public services support needs, for which public sector organisations and local communities are responsible.

Innovation Cloud[59] is identical in technology to the Government's portal with test and depersonalised data, and its main purpose is to provide a realistic and secure environment for testing IT solutions for the Government and the wider public sector. Such verified and tested solutions in an identical environment, such as those used for the Government needs, enable a rapid transition of solutions from various providers (from start-ups to international companies) to a production environment, for the needs of the Government or the wider public sector.

The transition from the current state to consolidated cloud infrastructure at several levels is done gradually, organised and coordinated in such a way that local data and applications of individual public institutions (starting with government ministries and agencies) are transferred to cloud infrastructure that provides central support. On the internal digital infrastructure, if it is justified by more efficient development, only concrete solutions can remain, which are used exclusively within one ministry or other public institution.

Key Challenges, Problems and Findings

- Satisfaction with e-services (among their users) is relatively high, but the level of use is quite low, especially in the field of e-services intended for citizens. The key identified reason is the low level of fully digitalised services (mostly information and partially digitalised services are present) that cannot be fully implemented electronically from start to finish, i.e., from application to realisation and payment.
- Insufficient awareness and lack of information on existing services has been identified. There is a need to centralise and promote all e-services that must be easily accessible in one access point

[58] https://buducnostzasve.me/

[59] Infrastructure scheme Annex 2

and follow unique standards of user-cantered design. This points out to the need for active promotion at the national level and improving the design of user-oriented services.

- For the efficient functioning of the e-government portal, it is necessary to integrate systems (electronic identification system, electronic payment system, etc.) that are key to the implementation of a large number of different services regardless of their specifics.
- The current system does not allow e-service providers to receive feedback from users who have applied for certain e-services, and this is a bad image for the e-government portal. This problem is due to the lack of interest of institutions in processing received requests for e-services that are under their jurisdiction, and are available on the e-portal.
- Untimely updating of the information contained in the descriptive section for e-services, especially for e-services of an informative nature.
- Lack of interest of institutions to "raise" certain e-services to a higher level of sophistication despite the existence of realistic conditions.
- Low level of knowledge of end users in the field of e-business, i.e., lack of information literacy and lack of information of end users about the existence of e-services on the e-government portal was recognised as a general problem.
- Keeping gender data when registering users, as well as when reporting on submitted applications on other portals developed by public administration bodies.

eID, trust services and cyber security

As already mentioned in the previous section, in order to implement digital transformation, it is necessary to regulate normatively this area. The Law on Electronic Identification and Electronic Signature regulates the conditions for the use of electronic signatures, electronic seals, electronic time stamps and electronic registered delivery services in legal transactions, administrative, court and other procedures, certification for website authentication, as well as electronic identification system and conditions. for the recognition of means of electronic identification of other states.

In accordance with the Law on Electronic Identification and Electronic Signature, MPADSM keeps records of providers of electronic trust services, the register of providers of qualified electronic trust services, as well as the register of electronic identification systems.

In addition to electronic trust service providers registered in the register of qualified electronic trust service providers, the following electronic trust service providers have been entered in the register:

- Ministry of Public Administration, Digital Society and Media - provides non-commercial electronic trust services for state administration bodies, recognised in the Decree on Organisation and Manner of Operation of State Administration (producing advanced electronic signature certificates) and as such entered in the Register of Electronic Trust Providers;
- DOO Zeko.me - provides electronic registered delivery services.

A qualified electronic signature has the same legal effect as a handwritten signature, i.e., a handwritten signature and stamp in relation to data in paper form and is acceptable as evidence in proceedings before state authorities, state administration bodies, local self-government bodies and local governments and legal entities performing public authority.

Bearing in mind that a qualified electronic signature is equivalent to a handwritten signature, issuance of electronic certificates free of charge for citizens and cheaper issuance of electronic certificates for the economy represents a significant potential for improving the use of electronic services in Montenegro, but an important progress was made with issuance of the new identity card with free certificates for qualified electronic signature and electronic identification.

The administration must offer attractive and most frequently used services to citizens and the economy in electronic form. It is not encouraging that the Ministry of Public Administration, Digital Society and Media **issued 712 electronic certificates to state administration bodies** from November 2009 to December 2020, **out of which only 421 were activated**. Namely, the Law on Electronic Identification and Electronic Signature stipulates that the Ministry of Public Administration, Digital Society and Media provides electronic trust services and qualified electronic trust services for state administration bodies, and when prescribed by law for other state authorities. This excludes a large number of bodies and institutions at both central and local levels.

In the last year, significant progress has been made when it comes to the presence of digital signatures and electronic identification. In particular, in the earlier period, digital certificates were predominantly used by companies in their communication with the Tax Administration, while digital certificates were not common to individuals. According to the data from June 2018, about 20,000 companies and only 400 natural persons had a digital certificate (National Report and Plan for the Improvement of Montenegro, 2020). Although the Law on Electronic Document was passed in 2008, its application in practice has been lacking. Only with the introduction of new ID cards with a chip, the issuance of which began in 2020, and the planned amendments to the Law on Electronic Documents, the possibility for wider use of digital signatures is realised.

As for provision of trust services development, it is necessary to point out the international agreements that Montenegro has signed. In this part, it is especially important to mention the following:

- Agreement on Mutual Recognition of Qualified Certification Services for Electronic Transactions Provided in Montenegro and Qualified Trust Services Provided in Serbia;
- Agreement with Northern Macedonia on Mutual Recognition of Certification Services for Electronic Transactions Provided in Montenegro and Qualified Trust Services Provided in the Republic of Northern Macedonia.

As already stated, a significant opportunity to accelerate the digital transformation is the introduction of new **ID cards, along which digital certificates for qualified electronic signatures and electronic**

identification are issued free of charge. Namely, the amendments to the **Law on Identity Card** stipulate that an identity card is an electronic public document, as well as that it contains a certificate for electronic identification and a certificate for a qualified electronic signature. Due to the pandemic caused by the COVID-19 virus, the Ministry of the Interior started issuing electronic ID cards on June 1, 2020, and by December 2020, it had issued 68,483 electronic ID cards to Montenegrin citizens.

The new ID card contains two digital certificates - an identification certificate and a qualified electronic signature certificate by which a citizen, when accessing electronic services, can prove his identity and electronically sign a document in a way that has the same legal effect as a handwritten signature. The National Report and Plan for Improvement of Montenegro (2020) determined that about 70,000 citizens of Montenegro[60], i.e., slightly more than 10% of the total population has an eID that allows the implementation of these actions. In order to popularise this solution, MPADSM has launched the Finish it Electronically campaign, which aims to inform citizens about electronic services on the e-government portal (www.euprava.me) and other electronic services provided by state authorities. In addition, in the course of 2020, secondary legislation regulating the implementation of the Law on Electronic Identification and Electronic Signature was adopted.

Reliable electronic identification and verification of user identity are a prerequisite for establishing quality, sophisticated services. The Ministry of Public Administration, Digital Society and Media, as already mentioned, is working on establishing an electronic identification and authentication system - the National Electronic Identification System (NS eID), which must integrate trust services from different certified trust service providers.

This information system aims to enable electronic identification, i.e., authentication and authorisation of users when using electronic services. The system supports centralised manner of management and the use of various electronic mechanisms for authentication and authorisation, as well as supports various technical solutions. NS eID is a starting point for verifying the identities of different entities (citizens, business entities, civil servants), which connects the electronic identities of entities and identification data (attributes) generated by different providers of electronic identification and attributes. This system is intended for the purpose of integrating the functionality of electronic identity identification into IT solutions that provide services using information and communication technologies.

The ID card as a new eID holder is a significant advance in this area as it can be used for services that require the highest level of trust services for citizens. On the other hand, there is a need for additional and existing trust services that can be used on mobile devices (which is currently not supported by the national ID card).

[60] According to the latest data obtained from the Ministry of the Interior of Montenegro as of December 1, 2021, 169,137 citizens have a new ID card issued after March 30, 2020.

To date, only some attention has been paid to this issue from a citizen's perspective, given that higher levels of maturity of e-services require the introduction and use of electronic identification. The Ministry of Public Administration, Digital Society and Media has yet to build new systems that include the use of new eID documents that every citizen of Montenegro will soon have (by 2025), and it is necessary to work on raising citizens' awareness of the possibilities and benefits of eID.

The need for different electronic identification (eID) mechanisms and solutions is particularly pronounced in eGovernment services, depending on the different requirements and needs of service providers, and therefore different solutions should be provided that meet the basics of standards and development platforms based on interoperability requirements.

For reliable implementation and use of electronic identification documents, it is necessary to have a secure infrastructure but also the trust of users in such systems. **Strategic planning of cyber security in Montenegro** is based on the **Cyber Security Strategy for Montenegro 2018-2021**, which defines mechanisms and instruments for implementing the interests of national security. In institutional terms, the establishment of the Directorate for Information Security and Computer Incidents (CIRT) in 2012 was a key measure in the field of information and cyber security. The National CIRT is the central institution for coordinating the prevention of and protection against online security incidents and other security risks. Until 2020, this body was an organisational unit of the Ministry of Public Administration, Digital Society and Media, and coordinated the work of local CIRT teams. In accordance with the Law Amending Law on Information Security, the Information Security Council has been established, as a framework for monitoring and improving cyber security in the public and private sectors. In addition, the National Security Agency, the Ministry of Defence, the Ministry of Interior, the Ministry of Justice, Human and Minority Rights and the Directorate for Protection of Classified Information have been identified as institutions responsible for cyber security. In addition, a **High-Tech Anti-Crime Group** has been established in the Ministry of Interior with the aim of strengthening the capacity of state law enforcement agencies. This institutional body deals with the issue of high-tech crime, such as classic acts of computer crime, child pornography, payment card misuse and copyright abuse. In addition, a Memorandum of Understanding was signed between Montenegro and NATO, which should facilitate cooperation and assistance between Montenegro and NATO in the field of cyber security (*Digital Agenda Observatory, 2020*).

Since Montenegro joined NATO on June 5, 2017, the cyber security field has become even more important. The Cyber Security Strategy of Montenegro 2018-2021 was created in accordance with international standards in order to build an integrated, functional and efficient cyberspace. The National Council for Information Security and Protection of Important IT Infrastructure oversees the implementation of the cyber security strategy. According to the Global Cybersecurity Index 2018 of the International Telecommunication Union, Montenegro ranks 61st out of 175 member states. On May 17, 2019, Montenegro became a member of the European Centre of Excellence for Countering Hybrid Threats based in Finland.

Amendments to the Law on Data Secrecy (adopted at the end of 2020) transferred the activities of CIRT teams to the Directorate for Protection of Classified Information, which operates within the Ministry of Defence (MoD). It is important to point out that the Ministry of Public Administration, Digital Society and Media is in the process of consultations during the development phase of the draft Cyber Security Strategy of Montenegro 2022-2026, as well as the Action Plan for 2022.

Key Challenges, Problems and Findings

- Relatively high prices of trust services are listed as an important barrier to mass use of services, so the widest possible use of free trust services on the new ID card should be considered.
- It is necessary to insist on the mandatory use of trust services for the entire public administration in order to streamline public administration procedures, which would serve as an example to other sectors.
- Another important and achievable goal based on experiences from other countries should be the full digitalisation of proceedings involving legal entities. The use of e-services by companies in Montenegro, starting with those through which the most frequent interaction with public administration bodies is implemented, would ensure the full use of digital identity at least for the business sector and legal entities.
- The non-existent link between the eID and existing trust services, as well as the unique identification number (JMB) and other identifiers for citizens, including the link between VAT, PIB and eID for legal entities is one of the key obstacles to wider use of e-services.

- It is necessary to improve and adapt existing as well as develop new eID systems and mechanisms in order to meet the requirements of the service provider, i.e., the type and level of e-service. Special attention should be paid to systems that operate on "mobile platforms", "smart" phones and other portable personal devices, and in that sense, improve the electronic identification system for the use of mobile technologies. (According to the last published monthly Report conducted by EKIP, at the end of October 2021, the number of mobile telephony users in Montenegro was 1,241,241, which corresponds to a penetration of 200.19%.)

Availability, interoperability and data management

Value and availability of data

Data is the driver and basic resource of economic development based on knowledge and innovation. The use of data creates new products and services based on the real needs of users, increases productivity and business efficiency, ensures the creation of evidence-based policies and improvement of public administration services. However, the use of data also raises important questions about trust, privacy and security, and how the benefits of using the data are distributed. In order to create additional market value,

it is necessary that the business sector and the Government use available and valid data for innovative solutions and good decision-making, which includes the existence of infrastructure for data collection, processing and availability, while respecting the principles of trust and protection.

In order for the Government to be at the service of citizens and the economy, it is necessary to ensure the collection of reliable and real-time data on web platforms that monitor statistics and through research reports, which makes access to "data of great importance" more important than ever. Although data is often not available in real time or in an appropriate format, the Government should take action and make data accessible to all with a responsible approach. On the other hand, the economic sector through more efficient use of data, not only generates accelerated economic development, but also creates additional value in the market and significant benefits for its business.

Data should be treated as a public good, simply because it is generated by the community, and its value is in use and reprocessing in order to create social benefits. Data created by institutions should be more accessible to all, not only to other institutions and authorities, but also to researchers, the business and civil sector, academia and citizens. In addition to availability, data sharing and access should be two-way. This means that the public sector should ensure access to data of public importance, but also that the business sector should provide access to its data to the Government, while respecting the principles of trust and privacy, to ensure better insight into the development of individual economic sectors and thus create evidence-based public policies. The government, the business sector and all those who use the data should build trust that they will manage personal data safely, reliably and ethically, and that the data will be protected in accordance with the law.

There is currently insufficient data available that can be reused in an innovative way to create added value, including those needed to develop artificial intelligence. It is Artificial Intelligence (AI) that is a very useful tool for sorting data, creating schemes for their use and identifying trends for making business and other decisions. Opening up data and reusing it for productive purposes is the basis of data management in order to make full use of its value and availability. Opening up data has direct implications for the economic and public sectors to innovate and support the creation of digital products and services that improve the lives of citizens by generating new economic value. Data is created with the money of all citizens and that is why their opening should be the main benefit for the community, so that through access to data one makes decisions of vital importance. The recently adopted Directive 2019/1024 of the European Parliament and of the Commission on open public administration data and their reuse ensures that the public sector makes as much data as possible easily available for use, especially to the business sector, but also to civil society and the scientific community, thus strengthening system transparency and institutional responsibility. Public administration in Montenegro produces and collects a large amount of information and data that have significant economic potential and by publishing them in an open format, they become available to a wider range of users. In August 2018, the Open Data Portal (data.gov.me) was launched, where proactive publishing of state data in a machine-readable format began. During 2018, 39 data sets were published that are continuously updated, while in 2019 the portal was improved with new

functionalities, in accordance with the guidelines of web accessibility. In June 2020, the portal was integrated with the European Open Data Portal, so that national data sets are available to the wider, European public from the moment of integration. During 2021, the portal was redesigned, and work is underway to improve it, both in terms of functionality and in terms of improving open data sets. Currently, the Portal contains 147 sets of open data, published by 20 institutions from 15 different thematic fields. The total number of downloaded data until the preparation of the Strategy is 61,672, and the data are available in excel, cvs, xml and json formats. The portal contains information available for re-use together with metadata in machine-readable and open format, in accordance with openness standards, in a way that facilitates search. It is this open document format that is independent of the software platform, while machine-readable data is structured in such a way that the software application can easily identify, recognise and retrieve reusable data.

Establishment of the Open Data Portal and publishing data of public administration bodies in an open format significantly contributes to the improvement of transparency, accessibility, as well as efficiency in the work of the Government and public administration bodies.

According to the Study on Implementation of Open Data Concept in Montenegrin institutions published by the Chamber of Commerce, within the ODEON project, in March 2021, the most represented institution publishing open data is the Statistical Office (MONSTAT), which publishes 30 groups of data sets on the portal, which is slightly less than the total number of data sets they have at their disposal). The Ministry of Education, Science, Culture and Sports is in second place with 28 data sets in which details on the number of children in preschool and school institutions in Montenegro are presented. The most common data on the portal are those in the fields of statistics (30), labour and social protection (29) and education (28), while the least represented data sets are in the field of finance, energy, mining and human rights.

Regarding the information that is most often downloaded from the Portal, the National Report and Plan for Improvement of Montenegro (2020) states that they are:

- Salaries of MPs, nominated, elected and appointed persons in the Parliament of Montenegro (1559)
- Educational institutions in the school year 2019/20 (887)
- Number of students in primary schools - total by gender, language of instruction and type of educational institutions ownership in the school year 2020/21 (864)
- Electronic Fiscalisation Taxpayers (860)
- Hospitability facilities providing accommodation, food and beverage service (860.4)

However, despite this encouraging data, there is still the problem that about half of the databases are provided by only two institutions, namely the Directorate of Statistics and the Ministry of Education, Science, Culture and Sports, and these are mostly data sets that are standard statistical data and which can most easily be converted into open data sets, due to the method of collection and further processing.

These are indicators that it should be acted in accordance with the EU Directive, and, in addition to standard open data sets, identify data sets of high value and importance, categorised according to the established methodology: geospatial data, environmental protection data, meteorological data, statistical data, company and ownership data, mobility. Identifying and publishing data sets of great importance contribute to a direct response to the needs of civil society, economy, academia and citizens and significantly reduces the number of requests for information in accordance with the Law on Free Access to Information. However, despite the legal obligation, most public institutions still do not publish data in an open format. Publication of data in open format is regulated by the Law on Free Access to Information. Amendments to this Law are being prepared and the main challenges have been identified, including the technical requirements for a digitalised process for access to information. The law will present additional progress in access to data and information, however, it is necessary to consider the introduction of a penal provision for non-publication of data in an open and machine-readable format, so that institutions are more up-to-date and responsible when preparing open data sets. In addition to the data sets themselves, it is important to ensure that they are constantly updated, in order to overcome the problem of late statistical processing of data sets of great importance and ensure their use value in real time. However, data sharing does not have to be limited to relevant institutions within Montenegro. Data can be shared with other entities, such as the European Union, for the purpose of creating electronic services that citizens of Montenegro can use under the same conditions as citizens of EU member states.

In that sense, at the time of writing the strategy, EU-COVID 19 platforms and applications are being created in Montenegro, which will be connected to the existing system of the European Union. This will connect the registers managed by Montenegrin institutions with the registers of the European Union member states that have relevant information in the field of health.

This is the first service of this type in Montenegro, which shows how the connection of data from registers owned by different countries will be reflected in the creation of additional value for Montenegrin citizens, because they will be able to use the same service as citizens of EU member states. Following this example, Montenegro should continue to increase the number of services that will be based on access to data platforms of other EU countries.

In this sense, the European Data Strategy sets out a plan to create a Common European Data Space, open to data without borders, containing all data, including personal and sensitive business data. This space would be safe and protected, and the economy would have access to large sets of high-quality industrial data, which would encourage growth and support the creation of new economic value.

One of the key challenges in the age of technological progress is the way personal data is used. The government should ensure that data protection laws respond to the intense pace of change, and that innovations created through the use of personal data are ethical and responsible. Legitimately collected and stored personal data could be disclosed knowingly or intentionally, risking the confidentiality of individuals, which is particularly risky in the health care sectors where, in essence, personal data is most sensitive. Therefore, data protection breaches should be reviewed, and stricter sanctions imposed for intentional and negligent use of personal data. Data protection in Montenegro obliges any Government body to inform data subjects/owners in case their personal data are not collected directly from the subject

and their further processing is planned. The notice must be published before the start of the processing of personal data. It contains information on which specific data will be processed and to which third party it will be transferred. The data subject has the right to submit a written request to any Government body to inform him or her whether they are processing some of his or her personal data and to expect a response within 15 days. This right may be limited if necessary for the purpose of national defence, national and public security, crime prevention, detection and prosecution of perpetrators crime, protection of economic and financial interests, and protection of other people, their rights and freedoms, to the extent necessary to achieve the purposes for which the restriction is introduced. When it comes to monitoring the protection of privacy, the Agency for Personal Data Protection and Free Access to Information is responsible for monitoring the application of the Law on Personal Data Protection. In performing the tasks within its scope, the Agency is independent and has the status of a legal entity, with advisory powers. (Digital Agenda Observatory, 2020).

Data Management

Public sector data is generated and stored in a number of institutions. In order for the Government to provide continuously and qualitatively services to users, it is necessary to have an infrastructure that will enable the availability of the right information at the right time, which means that full interoperability of the system must be ensured through the connectivity of registers. Connectivity and interoperability are the basic precondition for creating complex electronic services (levels 4 and 5) fully harmonised with the identified needs of citizens and the economy.

The European Data Strategy defines a framework for cross-sectoral management, access and use of data that aims to facilitate the use of data for innovative business. In November 2020, the European Commission adopted the European Data Governance Act. This regulation seeks to improve the availability of data in the EU by increasing the exchange of public data, strengthening trust in data intermediaries, and strengthening exchange mechanisms. In addition, the act indicates that the interoperability and quality of data, as well as their structure, authenticity and integrity are key to exploiting the value of data, especially in the context of AI application. In order to encourage the use of interoperability in the public sector and beyond, it is necessary to introduce a number of digital tools to make its application as simple as possible. Through the provisions of this act, the European Commission encourages the exchange of data between the economy and the Government in the public interest, supports the exchange of data between economic entities among themselves, especially addressing issues related to the rights to use jointly generated data. In addition, only where special circumstances so require, the European Commission seeks to make access to data mandatory, under fair, transparent, proportionate and/or non-discriminatory conditions.

The Law on Administrative Procedure (LAP) and the Law on Electronic Government introduced the principle of collecting data ex officio. These two legal solutions enable more efficient work of public administration bodies and the improvement of the quality of public services provided by the public

administration, but the introduced principle of obtaining information ex officio has not been sufficiently applied.

As the LAP introduced official responsibility for the exchange of information, there is now a legal obligation to do so. However, this Law does not require the use of a specific platform for the exchange or sharing of information electronically, but the Law on Electronic Government stipulates that all public administration bodies that keep records and registers within their competence in electronic form and manage information systems are obliged to share data electronically through the Single Electronic Data Exchange System (SEDES).

The infrastructure for electronic information exchange was established at the end of 2018, and there is currently an exchange of data between several important state registers such as the Central Population Register, the Central Register of Business Entities, the Register of Material Benefits Beneficiaries, the Education Register, the Central Register of Obliged Entities and Insured Persons. In practice, data exchange still often takes place in the traditional way - on paper or on CD - that involves the risk of data being compromised or lost. At the same time, there is an electronic exchange between individual bodies through web services, using the so-called peer-to-peer principle (P2P), and it is estimated that there are about 50 such web services that are currently functional. As these are mutually regulated exchanges between different bodies through various agreements, which provide functional and security aspects of the exchange, it is very difficult to persuade these institutions to switch to the exchange through the new central SEDES platform with its infrastructure offering a centralised, secure system, with possibility of storing exchange logs and with monitoring that shows the number of completed inquiries on a daily and monthly basis.

Reluctance to share data is also linked to organisational aspects, such as a clear division of responsibilities across the value chain of e-services. Service level agreements have not yet been formulated, causing day-to-day problems between state institutions. How these agreements determine who can access data, what restrictions exist and how data should be protected, they are very important from the point of view of secure data exchange. At the same time, the existence of such agreements is important for promoting data exchange and placing data in a specific and clear context. In the absence of a service level agreement, when an incident occurs during the provision of an e-service, the parties may not know who is responsible for resolving the issue. In addition, the support service, which is left to external associates, works according to the schedule every day in the office from 8 am to 5 pm, instead of being available 24/7. Since public service providers take full responsibility, uncertainty and lack of control in the provision of e-services are key obstacles to enhancing interoperability through the Single Information System for Electronic Data Interchange (SISEDE). The establishment of a Service Level Agreement (SLA) between service owners and data exchange system owners with clear responsibilities and service requirements is essential as such, along with adequate funding to support meeting these requirements.

Based on the data of the Statistical Office of Montenegro, the official statistics of Montenegro are based on data collected with a delay from the moment of occurrence of the phenomenon they show. Disclosure

of data up to 9 months after the end of the period to which it relates, reduces their use value for creating current policies, and it is therefore more used to quantify policy effects. Global crises (financial, migrant, COVID-19) have shown that in order to solve them effectively, it is necessary to have data in practically real time. Therefore, the digitalisation of Montenegro in the 2022-2026 period should create new opportunities for the system of official statistics of Montenegro through the consolidation of data and full application of the once-only principle.

As for the development of interoperability, it is necessary to point out the international agreements that Montenegro has signed. In this part, it is especially important to emphasise the following:

- Memorandum of Understanding with the EU on Montenegro's participation in the programme for interoperability solutions and common frameworks for European public administration, economy and citizens - ISA2 programme;

- Memorandum of Understanding on Regional Interoperability and Trust Services in the Western Balkans - Strengthening Regional Cooperation in Digitalisation Field.

Key Challenges, Problems and Findings

- There are legal bases in the existing legislation that allow access to public information and access to personal data, but in practice, the answers to these requirements are "hand-made". Catalogued and available information would enable fast and automated responses of public bodies and relieve them of the preparation of responses, which would significantly contribute to user satisfaction and optimisation of public administration procedures.
- The Open Data Portal exists, it is maintained, and it offers opportunities to focus on more relevant, interesting and automated data sets. Proactive automatic publishing of datasets can improve data usage and reuse. Shifting from the publication of generated reports after a certain period (as in the case of statistics up to 9 months) to the publication of raw data in real time will increase the usability of data and their value for decision-making. This will improve the capacity for better and more proactive response of public policies, economy, science, non-governmental organisations. Standardised, well-described, reliable and real-time data must aim to increase the widespread use of data and consequently improve processes in all segments of society.
- Insufficient number of (quality) data sets on the Open Data Portal. Although the new Open Data Directive provides a recommendation and specification for the publication of high value datasets (such as geospatial data, data on environmental protection, meteorological data, statistical data, enterprises and ownership, mobility), and although work has been done to raise quality and quantity of data, however, this was not enough to achieve a larger number of such data sets that increases the full potential of open data.
- All cyber security services should be fully functional 24 hours a day, 7 days a week.

- Creating preconditions for making public administration data available for reuse and secure exchange of certain categories of data, following the recommendations of the European Data Strategy and the European Data Governance Act.
- The end user should be allowed access to personal data collected and used by public authorities, provide a reminder of expiring personal documents and improve other formal communication with public administration. Involve the data protection authority in all-important developments related to e-services and e-government. Increase data control and privacy protection needed to increase trust in the information society.
- New opportunities should be created for the system of official statistics of Montenegro through the creation of a single Data Centre, managed by MONSTAT, which would be open and serve the analytical needs of the private, public, scientific research sector of Montenegro and beyond.

Digital Connectivity

The development of broadband access in the period of implementation of the Information Society Development Strategy 2016 - 2020 was marked by a significant increase in the availability of high-speed broadband access networks (access speeds greater than 30Mb/s) in the field of fixed electronic communications networks, while the significant development of access network with fiber optics (FTTH) in all municipalities in Montenegro (mostly in urban and suburban parts) should be emphasised in particular. In the area of mobile electronic communications networks and services, this period was marked by improved availability and increased capacity of mobile broadband data transmission services over 4G networks.

These activities were carried out thanks to significant investments made by operators of electronic communications networks and services in Montenegro. In the five-year period (2016-2020), investments amounted to slightly more than €440 million, or an average of about 39% of total revenues in the electronic communications sector, except in 2020, when due to the COVID-19 pandemic they were slightly less. This level of investment is significantly above the average in EU member states. Such high level of investment in the electronic communications sector confirms the fact that Montenegro has a predictable and stable regulatory framework, which has created equal conditions for all participants in the electronic communications market and which encourages competition as the best form of regulation.

The Information Society Development Strategy 2016-2020 defined clear goals for achieving progress in the areas of broadband infrastructure, which were largely in line with the objectives of the Digital Agenda for Europe, namely:

- basic broadband access - coverage: 100% of the population by 2018,
- high-speed broadband access (30 Mbit/s or more) - coverage: 100% of the population by 2020,
- Ultra-fast broadband access (100 Mbit / s or more) - usage: 50% of households by 2020.

The stated goals were set too ambitiously, because this strategy, as well as the accompanying documents, did not envisage all available mechanisms applied in the EU as an incentive to finance accessibility for areas for which there is no commercial interest in covering them (primarily rural areas).

Based on data collected by the Agency for Electronic Communications and Postal Services, provided by operators of electronic communications networks and services, and the atlas of demographic data on the number of households and residents by facilities (data from MONSTAT and the Real Estate Administration), at the end of 2020 the availability of high-speed broadband access was 80%. It is especially important to point out that fiber access networks (FTTH) are available in 66.7% of households in Montenegro.

The penetration indicator of broadband connections in relation to the number of households is 93.19%. while the share of households using ultrafast broadband access, with access speeds over 100 Mb / s was 28.79%[61].

Composite coverage of the population of Montenegro with the signal of mobile networks at the end of 2020 amounted to approx. 99% for GSM technology (2G), approximately 98% for UMTS technology (3G) and approx. 98.5% for LTE technology (4G). The number of users of mobile electronic communications services who, at the end of 2020, accessed the Internet was 539,547, which represents the penetration of mobile broadband access in relation to the total population of 87%. LTE technology implemented in the networks of mobile operators in Montenegro provides maximum transfer speeds of 150 Mb/s to the user (downlink) and 50-75 Mb/s from the user (uplink), in a channel width of 2x20 MHz and using 64-QAM modulation and 2x2 MIMO techniques. By applying the technique of aggregation of LTE carriers in two or three bands, depending on the width of the engaged spectrum, relatively higher speeds are achieved in the downlink (specifically, up to 300 Mb/s in the base station service zones where 2CA technique is implemented, i.e., up to 375 Mb/s at locations where 3CA technique is implemented).

In the area of the development of electronic communication networks and infrastructure, it is necessary to emphasise the international agreements that Montenegro has signed, and based on which it has committed to meet certain obligations within certain time limits. In this part, it is especially important to emphasise:

- Memorandum of Understanding on the 5G Digital Transformation Plan for the Western Balkans;
- Roadmap for reducing the price of roaming services between the EU and the Western Balkans;
- Regional roaming agreement.

According to the Survey on the degree of satisfaction of users of electronic communications services, in addition to a high degree of use, users of electronic communications services show a very high degree of

[61] Final Report on Implementation of Information Society Development Strategy of Montenegro 2016-2020

satisfaction with their quality, but also their prices in all market segments. The percentage of users satisfied with the quality of fixed telephony services is 79.7%, mobile services 84.7%, Internet access services also 84.7%, while 86.1% of users are satisfied with the quality of AVM content services (Agency for Electronic Communications and Postal Services, May 2021)

However, according to the Human Development Report for Montenegro 2020 - Towards a Digital Future for All (UNDP), the digital approach in Montenegro is unevenly distributed between urban and rural areas (80% vs. 63%, respectively), between the north and the south of the country (65% vs. 79%, respectively), and large differences can be observed in the use of the Internet by young people and those over 65 (99.6% vs. 72.8%, respectively). It should be noted that more recent data from the Statistical Office of Montenegro (MONSTAT) on the level of ICT use in households and by individuals show that in 2020 the gap between urban and rural areas decreased from 17% to 14%, namely, from 84.9 % of urban and 70.9% of rural areas connected.

Based on data from the survey on the Use of Information and Communication Technologies in Montenegro in 2020 (MONSTAT), persons who stated that they have used the Internet in the last 3 months, mostly do so every day or almost every day. The percentage of Internet use is almost every day higher for men and amounts to 89.2%, while for women it is 88.9%. The results of the survey show that with the increase in income, the percentage of households that have the Internet is growing, so that 98% of users with income over €600 use the Internet, 88.2% with income from €300 to €600, and 46.2% with income up to €300. When it comes to the territorial representation of the Internet in households, it is the lowest in the north and amounts to 69.5%, while in the southern region it is the highest and it is 88.5%.

When it comes to data centres and internal information systems, some government institutions maintain their own data centres and internal information systems, however, the development, implementation and maintenance of these resources are usually left to the private sector. The providers of these services are usually regional or international companies.

The Law on Determining and Protecting Critical Infrastructure defines the following sectors: energy, transport, water supply, health, finance, electronic communications, information and communication technologies, environmental protection, functioning of state bodies, and other areas of public interest. Critical infrastructure is determined on the basis of criteria related to the assessment of possible consequences of disruptions of operations or possible termination of critical infrastructure operating in the field of energy, transport, water supply, health, finance, electronic communications and information and communication technologies, environmental protection, functioning of state bodies, as well as in other areas of public interest. Therefore, the telecommunications infrastructure is classified as a critical infrastructure and more precise criteria for the identification and protection measures of critical ICT infrastructure must be defined in the sector.

Key Challenges, Problems and Findings

- It is necessary to work on further increasing the availability of ultra-high speed electronic communications networks through which high quality services can be provided, using all available mechanisms (sharing the built infrastructure of existing operators in other sectors, coordinated construction of multi-sector infrastructure, reduction of construction costs, simpler way of obtaining permits , preparing incentives for the development of digital infrastructure, etc.).
- Introduction of 5G mobile communication networks and their dynamic development that will enable the development of new services in various sectors of the economy (e.g. Internet of Things - IoT).
- There is a need to improve the understanding and clear definition of the critical role of digital infrastructure that would provide better security and reliability not only for ICT networks and services, but also services in other critical infrastructure sectors that directly or indirectly depend on electronic communications infrastructure security and reliability.

Skills and Education

Implementation of digital transformation, as well as participation in the digital market is not possible if there is no required level of digital skills. In order to identify which digital skills are needed to participate in the market, it is first necessary to define them. The European Commission has established that digital competence/digital skill means confident, critical and responsible use and engagement of digital technologies in learning, work and participation in society. These include digital literacy, communication and collaboration, digital content creation (including programming), security (cyber security related competencies) and problem solving. (Human Capital Digital Inclusion and Skills, EC, 2019)[62]. As technology continues to change, so does the set of digital skills needed. Digital skills go beyond technology itself and general descriptions may not be appropriate when applied to some specific environments.

Accordingly, the International Telecommunication Union (ITU, 2018) categorised digital skills into three levels - basic, intermediate and advanced - but stressed that the acquisition of digital skills is a continuous phenomenon. The United Nations Educational, Scientific and Cultural Organisation (UNESCO, 2018) has defined three areas of digital competence: (1) understanding and integration of technological competences, (2) applying technological knowledge in solving real and specific problems and (3) creating new knowledge. The lack of skills/competencies in Montenegro is recognised as critical, and accordingly in the process of preparing the *Digital Education Strategy* this challenge should be recognised.

When it comes to general skills categories in the digital economy, educational institutions and teachers should continue to focus their programmes and activities on developing technical, managerial, personal and social skills in order to create:

- "Digital" citizens (people who purposefully and confidently use digital technology to communicate, find information and buy goods/services).

[62] https://digital-strategy.ec.europa.eu/en/policies/desi-human-capital

- Digital workers (people who have the ability to evaluate, configure and use complex digital systems. These tasks often require basic programming skills).
- Digital creators (people who have the skills to build digital technology - usually software development).

According to the Digital Skills Insights document (ITU 2019), the division of digital skills is as follows:

- Technical skills, where the most relevant skills are the development and integration of company's information technology systems, knowledge of security standards and communication, virtual communication and the use of digital media, big data analytics (big data), artificial intelligence and cloud systems.
- Main managerial skills, which include complex problem solving, decision making, service orientation, negotiation, leadership, teamwork, autonomy, delegation of tasks, mentoring, flexibility and ability to work under pressure.
- The most important personal skills, i.e., ability and readiness to learn new things, emotional intelligence, analytical and logical skills, critical thinking, communication and networking, leadership, reliability and responsibility, adaptability, active cooperation, autonomy and creativity.
- Finally, the most sought after social skills are teamwork, ability to be committed and cooperative, ability to transfer/acquire knowledge, cooperation in synchronising processes, intercultural and language skills, research skills, professional ethics and cognitive flexibility.

Digital skills are a basic tool and an advantage not only for employees, but also for the unemployed who want to participate in the labour market. These skills have proven necessary for almost all occupations, **from primary to managerial positions**. As the work environment becomes more complex and interconnected, they become more and more interesting for employers, and the level and type of digital skills become crucial for inclusion in the labour market.

In recent years, governments, academia and industry have been extremely concerned about the skills and competencies required by new jobs in the digital transformation era. Based on data from public consultations for the preparation of the Montenegro Digital Transformation Strategy 2022-2026 (held in May 2020), the business sector identifies the insufficient number of students from IT-oriented faculties in relation to market needs. The need for a larger number of IT professionals and a more diverse range of skills among graduates is recognised.

The challenge of the lack of digital skills in public institutions, as well as expertise and civil society in general, has been recognised in other strategic documents and highlighted by the Operational Working Group for the development of the Strategy.

The research on the *Assessment of Need for Training of Public Administration Employees* was conducted by the Damar Agency, with the support of the UNDP Office in Montenegro in June 2021. The aim of the research was to analyse the need for training of employees in public administration institutions, in order to effectively plan and implement trainings to strengthen the skills of civil servants, especially in inclusive

digital management, open data management and introducing gender equality, but also in other areas, relevant to improving the legal and institutional framework for more efficient and accountable governance. The results of the research showed, among other things, that:

- Public administration employees assess themselves as digitally literate (average score 6.7) and that more than 1/4 of public administration employees believe that they are very well familiar with the field of digital literacy related to identity management, i.e., passwords that enable IT system to identify users and grant them appropriate access. On the other hand, employees are the least familiar with the area that deals with recognising threats to privacy, including identity theft, because 9.3% of employees in public administration heard about this area for the first time, while 47.2% heard about the mentioned area, but they are not familiar with what it specifically includes.
- As for legal acts that regulate issues in the field of digital management, e-government, data protection and use, 6 out of 10 employees in public administration are not familiar with of this. Only 6.0% are fully familiar with the regulations governing the mentioned areas, while 32.8% of employees stated that they are partially familiar.
- More than half of the employees (55.1%) believe that they lack skills related to the Origami system, and that acquiring these skills would improve the implementation of activities in the jobs in which they are engaged. In second place is Excel (45.9%), and in third place is PowerPoint (32.2%). Employees who participated in the survey were least interested in improving their skills in Outlook and Word.

The results of the survey indicate the need to organise various trainings in the form of workshops, seminars and the like, in order to better acquaint employees in public administration with the acts governing the field of digital management, e-government, data protection and use. In addition, a better campaign is needed within the public administration system itself on the importance of digitalisation and e-services, as the results of the research showed that employees are not sufficiently familiar with the digitalisation process. In addition, in order to strengthen work capacity, it is necessary to conduct regular training, in order to improve skills related primarily to Origami system, Excel and Power Point, but also applications related to online communication.

As for digital skills and attitudes of citizens about ICT, the research ICT as Driver of Further Development of Montenegro[63]" (IPSOS Public Affairs, 2018) states the following:

- Nearly two-fifths of citizens (38%) do not have a sufficient level of digital skills to use the Internet, i.e., either they are completely illiterate digitally (22%) or have only the most basic Internet skills (16%). On the other hand, just over a third of citizens (36%) estimate that they have enough skills to achieve what they want on the Internet, mostly or completely, with ease. Finally, approximately one in four citizens (26%) rates their skills only moderately.

[63] www.undp.org/content/dam/montenegro/docs/publications/NHDR/NHDR2018/UNDP_Report_ICT_3.10.pdf

- There are significant differences among citizens in the use of the Internet and digital competencies for its use, with the key dimension of the digital division of society being the age structure of citizens, but the gap is also noticeable in terms of educational structure of citizens. Namely, the frequency of Internet use, as well as the level of digital skills, systematically decrease with age, and increase with the level of education. For example, in the age group of 56 to 65, 65% of citizens never use the Internet, while in the group of citizens with the lowest education, 37% state the same. In addition, 3% of citizens aged 56 to 65 have a high level of Internet skills, compared to 71% of citizens aged 18 to 25. In addition, among citizens with primary and lower education, 27% assess that they have a high level of skills in using the Internet, while this is the case with 32% with secondary education and 54% of citizens with higher education.
- The majority of citizens (77%) believe that ICT has generally had a positive impact and that it has contributed to the improvement of various segments of people's lives in Montenegro. Although the majority estimates that the contribution is positive in all areas, citizens see the benefits of using ICT to a greater extent in everyday life than in the areas of economic development, and least in the area of democratisation of society. The use of e-services in the everyday life of citizens is among the last three in terms of the positive contribution of ICT.
- Despite the forgoing, citizens also recognise the negative consequences of the use of ICT, especially in social relations, which is recognised in the widespread opinion that the mass use of these technologies has led to alienation and general dehumanisation of society (with which 77% of citizens also agree).
- Although communication with other people is the most widespread area of using ICT in everyday life and the area in which citizens most positively assess the contribution of ICT to improving life, when it comes to the coherence of communication, nearly half of citizens (49%) prefer direct face-to-face communication.
- The key division in attitudes towards the contribution of digital technologies to changes in the personal lives of citizens, as well as in the case of attitudes towards their impact on people's lives in general, is based on Internet usage intensity, age and level of education. While 85% of active Internet users estimate that the penetration of ICT has improved their own lives, only 53% of occasional users believe so, and only 13% of those who do not use or rarely use the Internet. Also, the experience that with the penetration of new technologies nothing has changed in their lives is much more common among older than younger citizens and citizens with lower levels of education than among citizens with secondary and higher education.

In 2019, the Ministry of Science presented the Smart Specialisation Strategy of Montenegro 2019-2024. This strategy identified ICT as a sector with strong economic potential and transformed it into a strategic priority. However, it also identified as a weakness that education is not market-oriented, and that the outflow of ICT professionals and the lack of information awareness and literacy pose a threat.

Given the pronounced problem of qualitative and quantitative shortage of IT staff, the Chamber of Commerce conducted a survey on scarce IT occupations in 2020. The results of the survey indicate that

employers are very dissatisfied with the digital competencies of their employees, while on the other hand, employees believe that the level of their digital competencies is quite sufficient to perform work tasks. This indicates a lack of knowledge about digital tools and how they can increase efficiency, effectiveness and productivity (Final Report and Implementation of Information Society Development Strategy 2016-2020, 2021)

On the other hand, according to MONSTAT data published for 2019, the unemployment rate of young people aged 15 to 29 in Montenegro was 38.7%. The problem of unemployment is further emphasised in a comparative perspective - the average youth unemployment rate at EU level is 15.2%, and rates range from 6.1% (Iceland) and 6.2% (Germany) to 39.9% (Greece). Having this in mind, Montenegro is at the top of the countries in the region when it comes to youth unemployment, but the unemployment rate is twice as high as the European Union average. Removing barriers to the access of this population to the labour market, as well as reducing the unemployment rate have been recognised as priorities of Montenegro, which is confirmed by the current *Youth Strategy* that is in effect until 2021. Taking into account that the Information Society Development Strategy of Montenegro 2016-2020 defines the IT area as one of the most important sectors for economic development and prosperity of the country, the goal is to raise community awareness of the need for collective action to solve this problem.

Montenegro has a fairly high percentage of formally educated population: 90% when it comes to secondary education and 56% when it comes to tertiary education. However, 14% of tertiary education graduates nevertheless work in semi-skilled occupations (European Training Foundation[64], 2019). Historically and traditionally, there is a much better offer of educational programmes when it comes to initial than continuous and lifelong learning (European Training Foundation[65], 2020).

Access and participation are relatively well provided - Vocational Education and Training (VET) is attended by two thirds of secondary school students (International Standard Classification of Education (ISCED) level 4), and early school leavers represent only 5.7% students. Continuous attention is paid to inclusion in education. A quarter of young people aged 15 to 24 are enrolled in vocational education (one of the largest proportions in the region, indicating good progress towards goal 4 of sustainable development). The overall level of education is comparable to the EU average, but the insufficient quality of education and training hinders the complete transfer of the level of education to economic productivity, employment and social development. **Adult learning and lifelong learning remain underdeveloped, apart from the diverse but limited offer of active labour market measures** (European Training Foundation[66], 2020)

In June 2020, the Minister of Education, in cooperation with UNICEF, invited the international community to a coordination meeting of the online education sector. The progress made in education reform since

[64] https://www.etf.europa.eu/en/publications-and-resources/publications/skills-mismatch-measurement-montenegro

[65] https://www.etf.europa.eu/en/publications-and-resources/publications/continuing-professional-development-vocational-teachers-9

[66] https://www.etf.europa.eu/en/publications-and-resources/publications/continuing-professional-development-vocational-teachers-9

2016 and future priorities were highlighted. The development of a hybrid model was proposed, including distance learning as an integral part of education and training, as a response to the COVID-19 crisis. Continued support from the European Training Foundation (ETF) in the field of work-based learning and teacher training has been sought in response to ongoing specific needs arising from the crisis.

As for lifelong learning and retraining, legal frameworks have already been established in Montenegro. The National Strategy for Teacher Education in Montenegro 2017−2025 emphasises the need for continuous professional development of teachers and training in order to focus on digital skills. The Vocational Education Strategy 2015-2020 advocates the introduction of various forms of continuing professional development (CPD), including digital and online learning and platforms for sharing good practice and providing formal and non-formal opportunities for teachers and trainers to improve their digital skills. However, the teaching profession requires a university degree in a relevant field, with no specific requirements for digital skills, which are not assessed either during employment or later in the course of work.

The adult education system is primarily developed by the Ministry of Education, Science, Culture and Sports and the Centre for Vocational Education, in cooperation with other institutions. It is regulated by the Law on Adult Education, the Law on National Professional Qualifications, the Law on National Qualifications Framework, the General Law on Education and Upbringing, and other secondary legislation. In accordance with the Law on Adult Education, this field is an integral part of the national education system. Licensed adult education providers offer vocational training, programmes to enhance key competencies, including digital skills and competencies, as well as special vocational training programmes, and professional and personal development.

To date, digital skills remain underdeveloped in continuing vocational education and in this regard, it is necessary to expand the number of trainings, improve plans and stimulate the unemployed to retrain. Most continuing vocational education providers cite the lack of modern hardware and the lack of licensed teaching software, which is a major obstacle to digital and online learning (Digital Skills - Online Learning in Montenegro, European Training Foundation[67], 2017).

First of all, it is necessary to reform the education system (from pre-school to higher education) with the aim of developing digital literacy as one of the most important skills for the 21st century. The development of digital education as well as digital competencies of pupils and students in the education system is conditioned by other reform changes and directions of development in all areas of educational policy. Informatics and computer science should be included as a compulsory subject for students in the fifth grade of primary school, and a compulsory subject in secondary schools (now Informatics is an elective subject in the first year). Within this subject, students should acquire knowledge about information and communication technologies, digital literacy and the basics of computing. In addition, in preschool age, through the application of visual programming languages in children, digital skills and logical thinking in

[67] https://www.etf.europa.eu/en/publications-and-resources/publications/digital-skills-and-online-learning-montenegro

problem solving can be developed. As for higher education, curricula need to be brought closer to the real needs of the labour market, including dual education and lifelong learning.

Key Challenges, Problems and Findings

- Lack of digital skills (in addition to lack of information and awareness) is a key obstacle to digital development (noted in all analyses and by the vast majority of stakeholders).
- Lack of digital skills in the formal education system results in a rigid education system and outdated content in the field of informatics and digitalisation, so the whole line of formal education programmes must be renewed to create a better basis for acquiring and applying digital skills for future use of digital technologies and better foundation for professionals in digital development.
- There are a significant number of ICT graduates at universities each year, but the ICT sector cites a lack of trained professionals as one of the key development challenges. On the other hand, the "brain drain" of ICT graduates is identified, so the reasons for this situation must be investigated and must be an integral part of the Strategy.
- Lack of digital skills in certain groups (e.g. unemployed, civil servants, management structures, the elderly, etc.) results in poor position of these groups in the labour market, poor use and quality of existing e-services and slower digital development of various specific sectors (e.g. public administration, small and medium enterprises, introduction of Industry 4.0, participation of non - governmental organisations, etc.). Therefore, it is necessary to introduce specialised programmes and lifelong learning programmes for certain target groups.
- Lack of basic digital skills for smart and safe use of the Internet, information and understanding of e-services, use of eID among the general population, are key barriers to social digital development, so educational and promotional activities for the general population should be upgraded or developed.
- One of the key problems and challenges is the problem of access to digital technologies, both at the individual level and at the level of institutions and sectors. A number of families do not have digital devices and therefore do not have the opportunity to access information and develop digital skills. The problem of equipment exists at the institutional and sectoral level as well (e.g., the student/computer ratio in the education system is 15: 1).

ICT Sector

The report of the Global Innovation Index for 2020 ranks Montenegro 49th out of a total of 131 economies covered by this survey, while in terms of infrastructure, Montenegro ranks 53rd. Montenegro ranks 13th in terms of imports of ICT services and 43rd in terms of exports of ICT services (as a percentage of total trade). The current share of the ICT sector in GDP is 3.7% (MONSTAT, 2020). The strategic goal set in the Information Society Development Strategy 2016-2020 in the field of e-commerce was to bring the share

of ICT in GDP to 6%, which would reflect economic growth and job creation in other sectors, as well as make this share of e-commerce in total commerce to reach 1.5%.

A comprehensive analysis of the ICT sector cannot be conducted due to the lack of official multi-year statistics on the number of ICT companies and the number of employees in this sector. However, based on periodic research of international institutions and national organisations, it is possible to create a picture of the degree of development of the domestic ICT market:

- Based on the data from the Digital Innovation Profile[68] published by the International Telecommunication Union - ITU[69]) in 2020, there are 970 companies within the ICT sector that employ 4,441 workers, which compared to 2019 means an increase in the number of companies by 17%, and the number of employees by 15%.
- According to the data from the report of the Chamber of Commerce of Montenegro (Assumptions for the development of digital transformation on the cross-section of the situation in Montenegro - review from the perspective of the IT sector, 2020), according to the registration activity code, in 2018, 790 companies submitted their final statements of accounts, and 748 companies did it in 2019. Another 80 of them could be conditionally included in this group because they sell both IT devices and mobile phones. Out of a **total of 828 companies**, 275 companies reported revenue of €0.00, and 738 companies have 5 or fewer employees (out of that number, 655 companies have 1 or 2 employees, and 565 only one employee). **One thousand employees work in 28 companies, which have almost 80% of the turnover of the IT sector. Less than 30 companies have revenues of more than €1,000,000**.

The Montenegrin ICT sector is still at an early stage of development and has a lot of potential for improvement. Its development largely depends on state aid and the improvement of e-government services. The ICT sector in Montenegro is recognised as one of the most important sectors for future economic development.

Based on the Digital Innovation Programme of Montenegro, out of 88 patents held by national inventors in 2018, only six are digital (Digital Innovation Profile[70], 2020). It is also recognised that the development capacity of companies is low for several reasons: insufficient research and development expenditures, minimal use of ICT and advanced technologies (cloud, big data, block chain, AI, IoT, 3D printing, machine learning, robots / drones, etc.) and the lack of innovative business models offered by the collaborative economy (Digital Innovation Profile[71], 2020).

There is a realistic basis for establishing digital solutions in the following areas: tourism, real estate, smart cities, environment, health and well-being, education, business and trade, e-government and citizen

[68] https://www.itu.int/dms_pub/itu-d/opb/inno/D-INNO-PROFILE.MONTENEGRO-2020-PDF-E.pdf

[69] www.itu.int

[70] https://www.itu.int/dms_pub/itu-d/opb/inno/D-INNO-PROFILE.MONTENEGRO-2020-PDF-E.pdf

[71] https://www.itu.int/dms_pub/itu-d/opb/inno/D-INNO-PROFILE.MONTENEGRO-2020-PDF-E.pdf

engagement. The Montenegrin tourism sector in particular offers numerous opportunities for innovative technology-based solutions.

However, Montenegro still has a long way to go to use the potential it has in its IT sector. Every year there are more than 300 computer science graduates from 4 faculties from the University of Montenegro (Faculty of Electrical Engineering and Faculty of Natural Sciences and Mathematics), Mediterranean University (Faculty of Information Technology) and University of Donja Gorica (Faculty of Information Systems and Technologies). Several other institutions and organisations are also working on the development of the Montenegrin IT system. In that sense, the Science and Technology Park has a very important role, which is designed as a networked infrastructure with a central unit in Podgorica and impulse centres in Niksic, Bar and Pljevlja. The Science and Technology Park of Montenegro (NTP CG) in Podgorica was registered as a legal entity on September 20, 2019, when it officially started operating. Works on the reconstruction and adaptation of the facility where the NTP CG should be located began in May 2020, and it is expected that the NTP CG could start operating at full capacity by the end of 2022. In addition, the Technopolis Innovation and Entrepreneurship Centre in Niksic was opened in 2016 as the first impulse centre of the Science and Technology Park and the first phase of the NTP project. M: tel digital factory, the first ICT hub in Montenegro, was opened in 2017 by the mobile operator M: tel. BIO-ICT, Centre of Excellence in Bioinformatics, was launched by the former Ministry of Science with the aim of applying science and ICT technology primarily in sustainable agriculture and environmental protection. In addition to this, there is the Centre of Excellence for Digitalisation of Risk Assessment in Food Safety Field and Precise Certification of Food Products Authenticity FOODHUB, Centre of Excellence for Biomedical Research (CEBIMED) at the Institute Dr. Simo Milosevic, etc. Finally, the Montenegrin Business Angels Network (MBAN) was established in April 2018. From the aspect of non-formal IT education, projects for training of employees according to the ECDL standard have trained over 2,000 health workers and over 3,000 employees in education and public administration, and so far in Montenegro over 9,000 employees and citizens have passed ECDL certification. This project provided at least a minimal knowledge of ICT skills. There are also a large number of unemployed young people with technical background who can become a competitive IT workforce after adequate training.

In recent years, some of the largest foreign IT companies have opened their development centres and offices in the Western Balkans, including Montenegro. For example, Microsoft opened its office in Montenegro in 2007. Other global and regional companies such as Telenor, S&T, Saga, Com Trade and United Group are also present in the market. 4G signal coverage is about 98%. The number of broadband network users increased by 15.4% compared to the previous year. About 80% of households have an active broadband internet connection. The current number of companies using e-commerce is around 24%, and the Government's goal is to increase it to 45% by 2024. Given that about 700,000 people live in Montenegro, the domestic market is quite small, and the government is the largest employer and largest buyer in the country. This gives additional importance to Government policies related to the local digital ecosystem.

Regarding the regulatory framework, there are several important documents related to the ICT sector in Montenegro:

- The Cyber Security Strategy of Montenegro 2018-2021 was created in accordance with international standards in order to build an integrated, functional and efficient cyberspace.
- The Innovation Strategy (2016-2020) sets three main goals: increase capacity for innovation and technological development, strengthen instruments for networking and cooperation of actors in the innovation system and strengthen the potential for innovation in the business sector.
- The Information Society Development Strategy 2016-2020 was created in accordance with EU standards. The document defines key sectors, such as infrastructure/broadband access, information security, human capital, e-commerce, e-education, e-health, e-connectivity, e-government, research and development and innovation.
- Other important documents include the Smart Specialisation Strategy (2019-2024), the Innovative Start-up Promotion Programme in Montenegro (2019-2021) and the Centre for Excellence Promotion Programme.

Montenegro has recognised the potential of entrepreneurship and innovation, especially in the ICT sector, as a strong potential for smart growth. Government policies and strategies are strongly directed at promoting and strengthening corporate innovation and innovation growth, as factors of further economic development, which will lead to visible results in the transformation of the Montenegrin economy.

The interest of the Government should be to encourage the development of specific digital solutions in cooperation and partnership with ICT companies, which will improve the living and working conditions of citizens and the economy. Innovation policy is necessary for the full integration of entrepreneurial policies, the introduction of mechanisms that will slow down the outflow of talent in the innovation and entrepreneurship field and accelerate the pace of creation of innovation ecosystems.

The analysis of the IT sector in Montenegro conducted by the Digital Transformation Committee of the Montenegro Managers Association (*Assumptions for Development of Digital Transformation and Cross-Section of Situation in Montenegro - Overview from Perspective of IT sector, 2020*) indicates key issues:

- **The impression is that the IT sector in Montenegro is insufficient, even poorly developed and absolutely not competitive at the regional lev**el.
- **The basic characteristics of the IT sector** are an average small number of employees, small financial, and thus the development potential of IT companies and work in a small and underdeveloped market in terms of informatics.
- **IT companies employed 1,515 workers in 2019**, 0.9% more than last year. The income of the IT sector amounted to slightly more than €62 million, i.e., 3% less than in the previous reporting period. The sector's profit was over €9 million, an increase of 8.6%, but a loss increase of 48.6% was recorded. The data refer to companies registered for computer programming, consulting, repair, production, trade and other information service activities. Having in mind the method of "counting", a different statistical processing of the IT sector and the formation of a **register of active IT companies** at the Chamber of Commerce of Montenegro imposed itself as mandatory.

There is no strategic document in Montenegro related to the development of the IT sector. Independently or within the Montenegro Digital Transformation Strategy 2022-2026, this document should address the strategic approach to the development of the IT sector in Montenegro, from planning an adapted education system with increasing the number of students in IT disciplines, planning specialist courses for IT engineers, employment incentives in the IT sector, incentives for the introduction of quality systems in IT companies (especially ISO 20000 and ISO 27001), private-public partnership in the implementation of strategic IT projects and the involvement of as many local IT companies in the implementation of IT projects as possible. The future of the IT sector as an export segment of the Montenegrin economy should be defined as the final and long-term goal.

As for strategic IT projects (worth even several million euro), almost none in the recent past have been awarded to Montenegrin IT companies because few of them today have the capacity to deal with such challenges. And what is unfavourable, a serious outflow of staff is possible because the situation in Western markets is such that due to the sharp increase in demand for IT professionals, countries outside the EU are becoming their significant source of missing informatics energy.

Access to finance remains an important challenge, especially for small and medium-sized enterprises. These companies cannot meet the relatively strict requirements for bank lending, including high collateral, turnover, credit history and other conditions. Moreover, they have limited alternatives to bank financing. In its 2021 Southeast European Competitiveness Report, the OECD identified some progress in increasing funding for small and medium-sized enterprises (SMEs), but the challenge remains.

Data on the percentage of employed ICT experts in the total number of employees show that Montenegro lags behind the CEE-11 countries with 1.8%, while the EU has between 3.6% and 3.9%.

Despite the adoption of the Strategy for Development of Micro, Small and Medium Enterprises in Montenegro 2018-2022, progress in promoting the digitalisation of business and e-commerce is slow. The programme of the Ministry of Economic Development to improve the competitiveness of the economy includes a special budget line for digitalisation of business, which can finance more than 60 companies. A similar business digitalisation programme in 2018 was received by only 10 companies that applied. This reveals a pattern of limited efficiency and impact of such programmes, explained by a combination of factors such as low resource allocation, demanding application and project management procedures and inconsistencies with real market needs (*OECD, Southeast European Competitiveness Report 2021*).

Within the smart specialisation (S3), the ICT Committee of PKCG prepared a SWOT analysis of the ICT sector, which represents a valuable analytical view and basis for the development of the strategy. The following key findings can be highlighted.

There are important **strengths** on which we can build future development:

- Presence of internationally well-integrated excellent research teams/researchers;
- Developed higher education system;

- Availability of highly educated workforce;
- Attractive location and country size for pilot projects based on new technologies;
- Ecological preservation, availability and diversity of natural resources;
- Good telecommunication infrastructure;
- Presence of large international companies;
- Existence of a satisfactory legal and institutional framework.

The key **weaknesses** of the ICT sector, which the Strategy needs to address have been identified as

- Lack of "critical mass" in the scientific and research community in the digitalisation field due to fragmentation and weak cooperation;
- Generally insufficient transfer of knowledge and technologies from European knowledge centres and weak connection of R&D institutions with the business sector;
- Insufficient investment and participation of the public and private sector in research and innovation activities, which must take into account the needs of micro and small enterprises;
- Lack of data on innovation and development that are in line with the requirements of the European Union and available to the economy and the scientific and research community.

There are important **opportunities** that should be better used for faster digital development, such as:

- Access provided to leading international funds for research and innovation;
- Provided further access to large international research infrastructures (CERN, EMBL, etc.)
- Availability of natural resources and technogenic minerals for new industrial applications;
- Southeast Europe Implementation of "large research Infrastructure Sustainable Technologies" - SEEIIST;
- Establishment of a Science and Technology Park and development of centres of excellence;;
- Using human potential for research and innovation in the diaspora;
- A more active role of clusters in the innovative ecosystem.

But there are also dangerous **threats** that need to be identified and addressed by measures to combat them

- Outflow of highly qualified research and innovative human resources;
- Competition at the regional and global level at the economy level and development of ecosystems for digital development at the society level;
- Insufficiently developed traffic infrastructure;
- Administrative barriers to investment and business development.

Business sector entities and their associations identify the lack of IT and related professional profiles as one of the main limitations of the IT industry development and point out the difficulties in the work system that affect the ability to attract and retain the necessary IT professionals.

The business sector also identifies an important barrier in the fragmentation and relative underdevelopment of the local IT industry compared to foreign companies, which affects business opportunities and further widens the gap between local and international players. Strengthening links between domestic IT companies can increase local capacity and increase their competitive position in the market.

Based on information from business sector entities, the circumstances that accompanied the COVID-19 pandemic had less impact on the operations of the ICT sector, compared to other sectors. Through infrastructure and services, the ICT sector has played an important role in overcoming the problems caused by the pandemic. The smooth and continuous operation of numerous e-services is ensured, as well as the integrity and continuity of networks operations in the conditions of significantly increased traffic and user requirements for additional capacities and higher transmission speeds. Although underdeveloped, the IT sector immediately responded to a number of requests for new e-services and software solutions, having proved necessary for work from home, e-learning and the application of distance learning programmes, e-payments, e-commerce, thus demonstrating all the advantages of the IT industry reflected in its flexibility, without the need for resources that are unavailable or non-renewable. (Information Society Development Strategy, Final Report, June 2021).

Key Challenges, Problems and Findings

- In order to increase the quality and quantity of the IT industry in the GDP of Montenegro, the key challenge is the availability of qualified staff through the continuous development of IT skills. In public tenders, foreign IT companies often gain an advantage over domestic ones, so mechanisms should be developed that would enable domestic companies to be more competitive and foster the development of the domestic IT industry.

- Create a supportive employment environment for IT staff, both from Montenegro and abroad. It is necessary to prepare a plan for scholarships for the best students by the state, universities, local governments, IT companies with the obligation to employ students (that are granted scholarships) in domestic companies after graduation.
- Establish cooperation with educational institutions already at the secondary or university level of education, which could significantly improve the attractiveness of studies and the quality and applicability of students' knowledge.
- The classification of employees in the ICT sector by gender has not been recognised, and the possibility of further monitoring and reporting from a gender perspective should be recognised for this challenge.
- Establish cooperation between universities, high schools and (IT) companies and wider industry (branches of the economy defined as suitable for skills development in the Smart Specialisation Strategy) in order to create curricula tailored to labour market needs and define qualifications that would focus on scarce occupations.
- Create incentive to create qualified educational staff with digital skills and an understanding of rapid digital development at all levels of education. This shortcoming presents a key obstacle to attracting young people to use and even develop digital solutions.
- Create conditions in the business environment to support start-ups in the IT sector.
- As innovations mainly come from start-ups with less than 20 employees, while larger local companies are less active in the field of innovation, create incentives and programmes to keep all companies active in this segment.

Digital Awareness of Montenegrin Society

Insufficient efficiency in the implementation of projects from the digital agenda is a consequence of insufficient interest and cooperation of various actors from public administration institutions and the business sector, in terms of leadership and proactive management of the digital agenda, and ultimately the realisation of goals.

The Ministry of Public Administration, Digital Society and Media is active on its social media accounts (Instagram, Facebook, Twitter) and shares content related to the ministry's activities with citizens on a daily basis. However, the number of people who follow the accounts of MPADSM is not large, and does not exceed a few thousand on each of the social networks. Accounts on social networks of the Government of Montenegro have a significantly larger number of followers, over 30,000, but the topics of digitalisation and other similar content are not sufficiently promoted on them. The campaigns conducted by MPADSM have mostly received the support of numerous companies from the IT sector, **but there have been no major campaigns aimed at the general population using communicatively effective messages in the digitalisation field.**

An inspiring practice is the campaign of the Ministry of Education, Science, Culture and Sports, the Police Administration, the Ministry of Public Administration, Digital Society and Media and the Ministry of the

Interior named **Digital Literacy and Protection of Children and Youth on the Internet**. The goal of the campaign is to promote safe and responsible use of the Internet and modern technologies with a focus on children and youth. As part of the campaign, panel discussions are being held, at which, in addition to representatives of the departments, partners in the field of information security and digital skills, as well as psychologists and high school students are participating.

Another project that contributes to the promotion of digitalisation in Montenegro is the Balkathon competition, implemented in 2020 and 2021 with the support of the Regional Cooperation Council (RCC). Balkathon is an opportunity to promote digital smart solutions, as well as to network young people and start-ups to work on innovative solutions, but also to respond to the needs arising from the pandemic. In addition to the above, other competitions of this type are important for the promotion of digitalisation, such as CoronaThon, Spark.me Startup Adventures and others.

The Ministry of Public Administration, Digital Society and Media is developing the ObavijestiMe (InformMe) platform, which is a new tool in communication between the state administration and citizens. Namely, citizens will receive notifications, information on public calls and competitions, status of transactions, requests or applications submitted in state administration bodies or local self-governments by SMS, e-mail or letter. **A significant benefit of this platform is raising the awareness of citizens about digitalisation and how much it means for simplification and efficiency in communication with the administration when obtaining certain services.**

In order to create holistic and sustainable solutions in the digitalisation field, it is necessary to implement continuously and in cooperation with various stakeholders activities aimed at increasing public awareness of the importance and benefits of digitalisation, especially in the use of electronic services, created according to citizens' need, which would influence also their motivation to contribute to purposeful digitalisation.

It is necessary for Montenegro to focus its additional efforts on digitalisation of society in order to increase economic growth and better position its country in relation to the Western Balkans and Europe (OECD 2021 Report Competitiveness in Southeast Europe).[72]

Key Challenges, Problems and Findings

- The level of understanding and perception of digital development of society is difficult to measure, but it is in the cultural and sociological environment that one of the key challenges in the digitalisation process is recognised, which even leads to insisting on traditional non-digitalised processes in companies, public institutions and society. Due to the importance of digital development as a crucial horizontal factor for the entire economy and society, successfully addressing this challenge must be one of the focuses of the strategy. Therefore, this challenge needs to be solved by using a communication, anthropological and sociological approach, but also

[72] OECD (2021), Competitiveness in South East Europe 2021: A Policy Outlook, Competitiveness and Private Sector Development, OECD Publishing, Paris, https://doi.org/10.1787/dcbc2ea9-en.

by applying other, non-IT expertise that can contribute to building an affirmative attitude towards digital development.

SWOT Analyses

Based on the review of digital maturity in certain areas in the previous chapters, a basic SWOT analysis has been prepared that summarises a lot of information into high-level general knowledge.

STRENGTHS	OPPORTUNITIES

• Numerous activities have been implemented since 2016 and have laid the foundation for further development and digital transformation.
• Basic laws prepared or adopted.
• A large number of public e-services that exist and are available on one central e-government portal, as well as on specialised portals (e.g. e-health).
• Open data activities initiated.
• High recognition of the development potential of digitalisation.
• eID activities and trust services in place.
• A single system for data exchange (USEDE) between registers in the field of state administration has been established.
• High motivation of various stakeholders (Government, business, academia, NGOs).
• Geographical proximity, cultural proximity, good knowledge of English, as well as lower labour costs and ease of working together make Montenegrin IT staff and companies attractive to European clients.
• Human capital and education - staff with a solid general education that can be adapted to the specific needs of the market.
	• Application of new models of communication between the state and citizens through social networks in order to:
	  ○ raise awareness of e-services and their benefits;
	  ○ conduct marketing campaigns on digitalisation (on social networks).
	• Established and active cooperation with international organisations and active relations with reference countries.
	• The Common Regional Market of the Western Balkans (November 2020) creates an opportunity and a need to accelerate the digital transformation of Montenegro and take advantage of numerous synergies at the regional level.
	• Learning opportunities from countries that have recently made progress in the field of digital transformation.
	• Make public administration data available for reuse and secure exchange of certain categories of data following the recommendations of the European Data Strategy and the European Data Management Act
	• Development of open data sets of great importance in accordance with the EU Directive in order to increase the use value of data and their reuse for productive

• Developed and quality infrastructure.	purposes • Faster development of the ICT sector and its spill over effect (driver of digital transformation). • Strengthening the market position of ICT in the region. • Existing successes in the Montenegrin environment provide an opportunity to promote the best ideas, innovations, projects and partnerships in order to achieve the momentum of transformation. • Competitiveness of the countries in the region, which is reflected in the offer of highly qualified professionals whose labour costs are among the lowest in Europe. • Using human potential for research and innovation in the diaspora. • The state administration has a nominal desire to heed the advice of companies and the ability to react quickly as a small state. • Development of gender responsible digital services • Modern technologies and business trends are driving the need for new services. • Activities undertaken for networking of professionals in Montenegro and in the region. • Successful start-ups that serve as an incentive to develop this type of business. • European Union funds as a source of funding and the EU accession process that accelerates the overcoming of legal obstacles.
WEEKNESSES • Lack of coordination at central and high level regarding the implementation of digital transformation activities at	**THREATS** • Challenges in bridging the gap between strategy and actual implementation. • Citizens' distrust of e-services

national and sectoral level and high fragmentation of working bodies • Bottom-up access stronger than top-down governance • Insufficient digital skills and IT skills in public administration and society as a whole • Lack of ICT human resources • Low public investment in IT development. • Size and structure of the market: the market is dominated by small IT companies that are oriented to the domestic market where the largest client is the state. • A not-adapted education system that fails to teach general digital and programme literacy in primary and secondary schools and slow changing university education system with poor links with industry. • In a large number of primarily small enterprises, investing in information and communication technologies is still seen as an additional cost. • Low level of e-services digitalisation and lack of quality user-cantered service design, which also results in poor use of existing public e-services by citizens. • Lack of indicators to monitor the level of digital transformation at the national level and key performance indicators for e-services and the digital economy • Expensive Internet infrastructure of enterprises and not-adapted laws make it difficult to provide online services. • Less availability of various resources such as hubs, collaboration spaces, accelerators, innovation centres and various forms of support for alternative forms of business in this area (start-up,	• Continued brain drain due to more attractive conditions in other countries/regions. • Further strengthening of international companies' position threatens the local ICT economy. • Faster digital development in other countries further highlights Montenegro's relatively slow progress in digital development/maturity. • Strengthening Montenegrin dependence on external knowledge due to the low absorption capacity of the public administration system. • Changes in the political arena that affect the prioritisation of digital transformation. • Montenegro, like other small countries, depends on trends in global change and local practical application of existing technologies. • A small market will significantly hinder the development of large specialist companies. • The non-export-oriented perspective of IT development is largely related to the economic progress and economic development of Montenegro. • The presence of hiring external associates and freelancers in the future may lead to a reduction in the number of staff available on the labour market. • Innovation mainly comes from start-ups with less than 20 employees, and larger local companies generally remain indifferent to innovation

freelancing). In particular, the lack of mentoring for beginner development. • Ease of employment of individuals from Montenegro leads to the fact that the best staff easily makes the decision to leave domestic companies and start working for fees for foreign companies. • There is a lack of formal state support for the IT sector in recognition of the potential to develop the overall economy. • Insufficiently developed digital awareness of Montenegrin society.	

III VISION AND STRATEGIC DIRECTIONS IDENTIFIED

Fast digital development available to everyone –
a chance for the long-term success and prosperity of the whole society

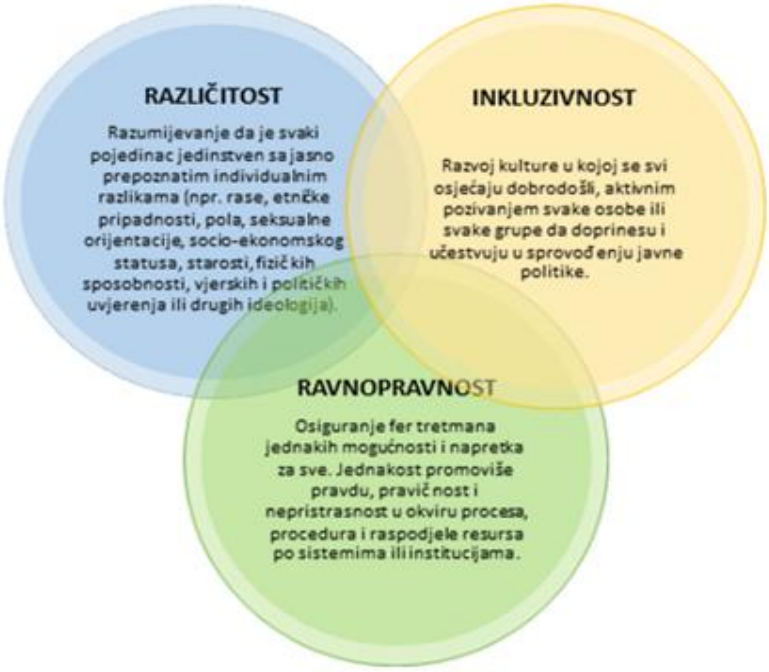
It is necessary to have a clear vision of the results to be achieved and the readiness of all participants to participate equally in creating a digital society, for the initiative of digital transformation of the whole society to give positive results, and for strategic documents and accompanying action plans to be an effective tool for implementing such initiatives. In that sense, in defining the vision and results, no element of the future digital society should be neglected, because its exclusion from the entire system (starting from the situation analysis, through defining goals and vision of development, to implementing various solutions) cannot create a complete whole. i.e., digital society. Although strategic frameworks vary from country to country, what is common to all is the need for a synergistic role of all participants/elements that make up the digital society.

In the previous period, Montenegro has established a good basis for the development of the digital society, which needs to be further improved in parallel with the progress of technology. However, if reliable infrastructure, sets of quality and open data and a high level of automatic exchange are not provided, it is not possible to create e-services in accordance with the needs of citizens and the economy, nor to provide access to users under equal conditions. The core of the transformation towards digital society is in the establishment of quality physical and technological infrastructure, as well as in providing available high quality data and their proper use in order to create new value. Data is a huge resource for improving people's lives, addressing societal challenges, generating new economic growth and securing Montenegro's competitive position in the digital transformation process, but one should have in mind that data management poses challenges to trust, privacy, security and data usage with full respect for legal norms and ethical principles.

Transformation is not possible if there is no leadership and political will at the highest level in a country. The existence of leaders, their support (in institutional, political, normative and even financial terms) as well as a high level of understanding and readiness to accept digital change, are a prerequisite for good results. In Montenegro, as the *Situation Analysis for Preparation of Montenegro Digital Transformation Strategy 2022-2026* has shown, a clear and detailed normative system has been established, which is one of the steps and preconditions for creating a digital society. Further adequate application of legal solutions will depend on the commitment of the Government towards implementing digital transformation.

The presence of an IT-educated workforce, the engagement of local IT-educated experts and raising public awareness of the importance of application but also education in the field of digital technologies and changes, are a condition for creating a knowledge society on which the digital society rests. Education and training, from the lowest level of education to the highest level and level of adult education through specialised topics, in the long run, can give positive results. Raising public awareness of the importance and benefits that technology and technologically supported solutions represent is an indispensable

element in the process of digital transformation. Montenegro identifies the need to strengthen this element of the digital society, because without knowledge and knowledge sharing it is not possible to implement or use the solutions of a digitally transformed society. In addition, quality and inclusive education based on the smart use of digital technologies is a prerequisite for the sustainability of all other measures and interventions. Initiatives and activities of the business sector are important both for strengthening the (digital) economy and for society as a whole, because this category is one of the key drivers of innovative solutions and the application of such solutions in practice. Recognising the key role of the ICT sector in Montenegro, supporting their initiatives and innovative solutions, involving this sector in digital transformation processes, with the common goal of creating an equal society based on knowledge, will give good results for the entire Montenegrin digital society.



Having in mind all the above key elements in the process of creating a strategic framework and its initiatives, through the Digital Transformation Strategy 2022-2026, Montenegro must develop digital infrastructure systematically and in a balanced way, provide accurate, up-to-date and secure data, develop digital solutions, optimise , connect and digitalise processes and services and provide everyone with equal access to these solutions. Engaging all these elements together will foster social development, which should be based on the principles of equality and accessibility, so that everyone can feel the benefits of digital transformation. If digital technologies are expected to help create a better and more competitive society, joint initiatives and activities of all elements of a society, with all the specifics that characterise each individual element, will make Montenegro progress in the process of digital transformation and, due to its specifics, record fast growth and development in the function of creating a better and sustainable digital society. Digital development is a priority today in almost all countries of the world. Understanding the "speed" of progress is more important than the reference positions that different digital development indices represent, because success will not only be measured in comparison to others but also in relation to previous stages of digital development. In that sense, Montenegro has a potential advantage because as a smaller country, it can react quickly to technological opportunities and more easily provide the necessary infrastructure, and that is one of the bases that should be used in the implementation of this Strategy. The vision of faster development in today's digital world is an ambitious and powerful motivator, but it must be based on the principles of respect for diversity, equality and inclusion.

In order to build better an inclusive digital society in Montenegro, it is necessary to provide equal conditions for all citizens on the path of the knowledge society and work on overcoming the digital divide in every respect. The modern digital society must be built on the values of equality, inclusiveness, openness and equal opportunities for all. This means that each individual must be an equal member and user of the digital ecosystem, but at the same time must take part of the responsibility for the progress of society whose benefits he/she uses.

Therefore, it is necessary to integrate activities that reduce digital exclusion in every respect. Although providing access to information and communication technologies and services can give equal opportunities to all citizens, it is not the only guarantee of the use of technologies and benefits that individuals and society as a whole can achieve. It is therefore necessary to work on raising the awareness of all social groups about the opportunities that these technologies provide in everyday life. On the other hand, the social and economic exclusion of vulnerable groups can be overcome by creating electronic services that will recognise the contribution that these groups can make to society. Having this in mind, the strategic directions be considered individually through appropriate activities within the action plans that will accompany this strategy.

STRATEGIC GOAL I
IMPROVING CAPACITIES AND CAPABILITIES FOR DIGITAL TRANSFORMATION OF MONTENEGRO
EFFICIENT AND EFFECTIVE COORDINATION AND MONITORING OF DIGITAL TRANSFORMATION
IMPROVING DATA AVAILABILITY, INTEROPERABILITY AND DATA MANAGEMENT
INCREASED COVERAGE AND MODERNISATION OF ELECTRONIC COMMUNICATION INFRASTRUCTURE
DEVELOPMENT AND IMPROVEMENT OF DIGITAL KNOWLEDGE AND SKILLS OF MONTENEGRIN SOCIETY
RAISING THE AWARENESS OF CITIZENS AND THE ECONOMY ABOUT THE IMPORTANCE OF DIGITAL DEVELOPMENT
IMPROVING THE QUALITY, QUANTITY AND USE OF E-SERVICES
IMPROVEMENT AND DEVELOPMENT OF THE ICT SECTOR
STRATEGIC GOAL II
STRENGTHENING DIGITAL AWARENESS OF MONTENEGRIN SOCIETY AND DIGITAL COMPETITIVENESS OF ICT SECTOR

The challenges in the digital transformation of Montenegro identified in the Situation Analysis are addressed through two strategic goals that reflect the Montenegrin digital reality and continue to be channelled within seven operational goals through priority areas or activity groups to achieve desired progress.

The first strategic goal focuses on **Improving Capacities and Capabilities for Digital Transformation of Montenegro**, and the second on **Strengthening Digital Awareness of Montenegrin Society and Digital Competitiveness of ICT sector.**

IV STRATEGIC AND OPERATIONAL GOALS WITH ACCOMPANYING INDICATORS

Strategic Goal I:

Improving Capacities and Capabilities for Digital Transformation of Montenegro

Successful digital transformation or long-term rapid digital transformation must include all key development elements of the so-called smart communities.

Balanced development of all parts of society is ensured through coordinated management, interconnected processes reduce the negative impact of silos and provide holistic services to citizens and the economy. Unambiguity, availability and security of data are the basic prerequisites for the efficient functioning of all services and strong integration into "back-office" systems. Powerful and secure infrastructure enables stable and fast implementation of all digital solutions so that it is always available and reliable. The key success factor is, of course, the knowledge of end users of digital services, the knowledge of employees who use digital systems in the workplace and the knowledge of developers who create new services and digital tools.

All performance factors of Montenegro's internal digital development are addressed with four operational objectives.

OPERATIONAL OBJECTIVE 1.1

Efficient and effective coordination and monitoring of digital transformation

Due to its nature, digital infrastructure requires central management and coordination, in order to ensure compatibility and execution of numerous processes and technologies. The coordinating role at the broadest social level, which includes the smallest sectors of the economy, science and academia, NGOs and the state, will be the responsibility of the national coordinating body established after existing models of digital coalitions abroad. This will ensure the balanced development of compatible systems, the use of horizontal functionalities and also encourage proactive coordination of digital development of individual segments of society. Increased quality of coordination and established mechanisms for monitoring the progress of digital transformation will also ensure greater efficiency and transparency in the use of resources and create other synergies.

OPERATIONAL OBJECTIVE 1.1	Efficient and effective coordination and monitoring of digital transformation		
Indicator	Baseline value	Target value by 2024	Target value by 2026

Percentage of proposals accepted by the national coordinating body, out of the total number proposed by the sectoral coordinating bodies	0	70%	100%
Percentage of conclusions adopted by the Government of Montenegro based on the recommendations of the national coordinating body	0	80%	100%

OPERATIONAL OBJECTIVE 1.2

Improving data availability, interoperability and data management

Availability of quality and accurate data is a key prerequisite for quality digital services and management of electronic and other systems. In order to achieve this, it is necessary to provide a comprehensive legal framework for secure data exchange in terms of access rights, as well as technical capabilities for secure data storage and exchange. In addition to the availability of data, the strategy actively encourages the creation of new digital solutions that will exploit the potential of existing data by using and reusing data. Greater transparency and openness of data will have a positive effect on increasing the transparency of public institutions. Improving the quality and availability of data will result in better electronic services for citizens, enterprises and public administration and, last but not least, significantly improve decision-making and planning processes.

OPERATIONAL OBJECTIVE 1.2	Improving data availability, interoperability and data management		
Indicator	Baseline value	Target value by 2024	Target value by 2026
Number of institutions that publish data on the Open Data Portal	20	100	200
Number of electronic registers in the meta - register	12	80	150
Percentage of eServices kept in the catalogue of e-government services, which can collect data from more than one register per query	n/a	10% of all electronic services from the e-services catalogue	20% of all electronic services from the e-services catalogue

OPERATIONAL OBJECTIVE 1.3

Increased coverage and modernisation of electronic communication infrastructure

The availability of adequate ICT infrastructure is the basis for all digital services, both for their development and for their widespread use. In addition to digital skills, infrastructure is a key prerequisite for the widespread use of developed digital solutions. Therefore, the strategy envisages systematic planning of infrastructure development, presentation of new modern technologies, systematic provision of efficient and secure channels between key entities, which ensures the availability of the so-called "last mile" and sufficient backbone capacity. Thoughtful architecture at the state level is very important in providing infrastructure because it ensures harmonious development and cooperation of the private sector. Moreover, it manages the development of less commercially interesting parts of the communication infrastructure through a system of incentives (e.g. financial, tax, etc.). ICT infrastructure is already defined as critical infrastructure[73] in Montenegro, so as such its development will focus on availability (last mile), security (cyber security) and redundancy.

OPERATIONAL OBJECTIVE 1.3	Increased coverage and modernisation of electronic communication infrastructure		
Indicator	**Baseline value**	**Target value by 2024**	**Target value by 2026**
Share of citizens using the Internet	**82,2%**	**86%**	**89%**
Percentage of household coverage with fixed BB at the speed of 100Mbps +	**76,7%**	**81.6%**	**86,4%**
Percentage of population coverage by mobile BB at the speed of 10 Mb / s +	**97,2%**	**98%**	**99%**

OPERATIONAL OBJECTIVE 1.4

Development and improvement of digital knowledge and skills of Montenegrin society

Available infrastructure, affordable services and the current needs of individuals or organisations are not sufficient for the widespread use of digital solutions if an adequate skill level is not established. Digital skills should be developed in the earliest stages of schooling, and later upgraded through secondary education and then develop specific qualifications during tertiary education. The formal part of education to tertiary level will be improved and monitored through the activities of the *Education System Digitalisation Strategy*, *and accordingly* the Digital Transformation Strategy in particular identifies three separate groups of digital knowledge that need to be strengthened, namely: users, employees and

[73] **The Cyber Security Strategy 2022-2026** recognised the strategic goal: A system for the protection of critical information infrastructure established. Where it is defined through two operational goals: Amendments to legal solutions in the field of critical information infrastructure protection and Adoption of a list of critical information infrastructure.

developers. In order to increase the level of digital skills, the Strategy defines activities in the field of formal education, lifelong learning for all target groups of citizens and a number of activities related to raising the skills of employees in the public and private sectors. A significant place belongs to increasing the percentage of employed women/IT professionals, as well as strengthening the level of knowledge and skills in the fields of STEM and digital transformation. An important part of providing knowledge and skills (especially in the group of "developers" of ICT solutions) is the system of incentives to strengthen career guidance. In the public sector, through the improvement of the digital learning platform (e-Learning) in the Human Resources Administration, but also for the planning and design of specific courses to upgrade the skills of officials providing digital services, digital knowledge will be built and digital skills necessary for effective digital transformation will be adopted. Digital literacy at different levels of complexity and for different purposes is one of the key competitive advantages of modern society in the modern world, and therefore Montenegro will intensify its efforts to create conditions for long-term and rapid digital development.

OPERATIONAL OBJECTIVE 1.4	Development and improvement of digital knowledge and skills of Montenegrin society		
Indicator	**Baseline value**	**Target value by 2024**	**Target value by 2026**
Percentage of graduates of study programmes in the IT field in relation to the total number of graduate students at all universities	**8%**	**12%**	**15%**
Number of trained citizens from a vulnerable group of citizens who attended ICT trainings with adult education organisers	**0**	**300**	**600**

Strategic Goal II:

Strengthening Digital Awareness of Montenegrin Society and Digital Competitiveness of ICT sector

The reality of the implementation of a large part of strategic documents is often not great because many goals, although well planned and realistic, are often not achieved, and measures do not bring the desired effects. In the digitalisation field, there is no doubt among experts about the necessity and justification of the development and use of modern digital solutions, but this goal cannot be achieved if the general public does not recognise their own and collective benefits from the developed digital environment and its wide use. In the Situation Analysis, awareness of the importance of digital development was identified as one of the key challenges. With this strategic goal, special attention is paid to electronic services, which

represent a great potential for improving the efficiency of public administration as a system, as well as for improving services to citizens and the economy. The ICT industry development is systematically addressed and the activities aim to contribute to increasing added value, improving the structure of employees, reducing brain drain and attracting talent from abroad. As the well-developed ICT sector is one of the key drivers for the modernisation of the entire economy, the measures are aimed at the development of the local ICT sector and its role in the development of ICT infrastructure.

Thus, the second strategic goal emphasises the importance of awareness, understanding and action of both citizens and the economy, with the systematic improvement of electronic services and strengthening the ICT sector.

OPERATIONAL OBJECTIVE 2.1

Raising the awareness of citizens and the economy about the importance of digital development

Understanding the necessities and advantages of digital development in the broadest sense should not be taken lightly. Understanding also cannot be increased by sporadically communicating common benefits. Since digital transformation is a long-term process that requires broad mobilisation of people and all types of organisations, this operational objective deals with systematic conceptualisation and planning of arguments, communication channels, key messages and their bearers in the form of a comprehensive communication campaign. This will enable a more targeted and coordinated increase in the understanding of natural persons and legal entities about the individual and collective benefits of digitalisation. It is also important to pay the necessary attention to the organisation of campaigns in order to promote an accessible and safe digital society for women and girls. In order to achieve this goal efficiently, it is essential that different entities communicate synchronous messages and highlight the same benefits through different channels in different ways. To this end, enhanced internal coordination within the state administration is envisaged.

OPERATIONAL OBJECTIVE 2.1	Raising the awareness of citizens and the economy about the importance of digital development		
Indicator	**Baseline value**	**Target value by 2024**	**Target value by 2026**
Percentage of state authorities actively involved in the communication campaign	/	50% of state authorities in relation to the total number	75% of state authorities in relation to the total number
Percentage of citizens informed about the availability and use of electronic services	22% of citizens consider themselves mostly or fully familiar with electronic services	45% of citizens consider themselves mostly or fully familiar with electronic services	65% of citizens consider themselves mostly or fully familiar with electronic services

Percentage of the economy informed about the availability and manner of using electronic services	87% of economy consider themselves mostly or fully familiar with electronic services	90% of economy consider themselves mostly or fully familiar with electronic services	95% of economy consider themselves mostly or fully familiar with electronic services

OPERATIONAL OBJECTIVE 2.2

Improving the quality, quantity and use of e-services

The level of digital maturity of a country is reflected primarily through the phase of development and use of electronic services for citizens and the economy. There are currently a large number of electronic services in development stage in Montenegro, and their daily use is well below expectations. This objective focuses on systematically increasing the attractiveness, quality, quantity, interoperability and ease of use of electronic services, in order to avoid the growing challenge where supply is much higher than demand. The performance of an individual e-service is primarily assessed through the intensity of its use. Future activities focus on holistic principles for the development of user-oriented services. In order to create a better user experience, it is necessary to improve the national eID scheme and through targeted activities to adapt existing as well as develop new eID systems and mechanisms, and especially to improve the electronic identification system using mobile technologies, while it is necessary to point out to the need of clear disaggregation of collected data by gender, along with gender harmonisation of electronic data exchange services. Also, the widespread use of **interoperable electronic services** connected to the state IT system is the most efficient way to modernise and rationalise the state administration, which in this way can best get closer to the citizens.

OPERATIONAL OBJECTIVE 2.2	Improving the quality, quantity and use of e-services		
Indicator	Baseline value	Target value by 2024	Target value by 2026
Online Services Index (OSI)	0,5412	10%	20%
Share of unique users who used an ID card for identification/signature when using electronic services	n/a	20%	50%
Number of users of electronic identification and trust services (excluding the Ministry of the Interior)	20.519	22.570	27.084

OPERATIONAL OBJECTIVE 2.3

Improvement and development of the ICT sector

Accelerated development of the ICT economy will be achieved through greater availability of ICT products, greater usability of digital solutions in all industries and public systems, and with systemic support and promotion of innovation. The defined measures will increase the domestic market potential of the ICT industry, as well as the possibility of penetrating the international market. Concrete measures to achieve these goals are, on the one hand, improving business conditions (subsidies and incentives - external actions), and on the other hand measures to encourage internal modernisation, innovation, new knowledge and partnerships (competitiveness - internal measures). Montenegro can successfully use its size to respond quickly and adapt to technological developments and new market opportunities, as infrastructural and regulatory conditions are actually easier to provide in smaller countries.

OPERATIONAL OBJECTIVE 2.3	Improvement and development of the ICT sector		
Indicator	Baseline value	Target value by 2024	Target value by 2026
Number of active ICT companies	970	1.115	1,230
Number of employees in ICT companies (data disaggregated by gender)	4.441	4.885	5.500

V KEY ACTIVITIES FOR IMPLEMENTATION OF OPERATIONAL OBJECTIVES

Objective 1.1. Efficient and effective coordination and monitoring of digital transformation

Through the realisation of activities of this objective and articulation of appropriate leadership and building models of decision-making and grouping of knowledge, and thus animating a wider range of stakeholders, a stable system will be established, flexible enough to meet future challenges and demands of digital transformation and rapid technological and social change.

Key activity bearers in the implementation of this objective are Government of Montenegro / Secretariat General of the Government of Montenegro, MPADSM, MONSTAT

Partners: PKCG, AmCham, MMA, Foreign Investors Council

Activities The activities identified as key activities in implementing this objective are:

- ***Establishment of a national coordinating body at the social level in order to improve the process of digital transformation of Montenegro***
- ***Preparation of an analysis of the existing management, advisory, infrastructure at the level of public administration relevant to the process of digitalisation and digital transformation, with a recommendation for the improvement of the Council for Electronic Government***
- ***Preparation of an analysis of the existing personnel and technical-technological infrastructure with a proposal for defining the optimal organisational form for the operational implementation of IT development and support in public administration***
- ***Establishing a system for monitoring key indicators of digital transformation through regular reporting at the national level***
- ***Establishment and strengthening of a working group/commission for monitoring the implementation and realisation of the Strategy activities***

Through the establishment of a national coordinating body at the social level, analysis of the existing advisory, personnel and technical-technological infrastructure, public administration will make a significant contribution to creating appropriate legal frameworks and infrastructure, creating modern e-government, raising information security level, supporting start-up ecosystem, digitalisation of business processes, paperless business, etc.

Objective 1.2. Improving data availability, interoperability and management

For a state tailored to citizens, focused on providing services, it is important to ensure through implementation of activities that various organisations and information systems can cooperate and exchange information, i.e., to ensure efficient cooperation of all public administration actors as well as automation of exchange and quality integration of processes at all levels.

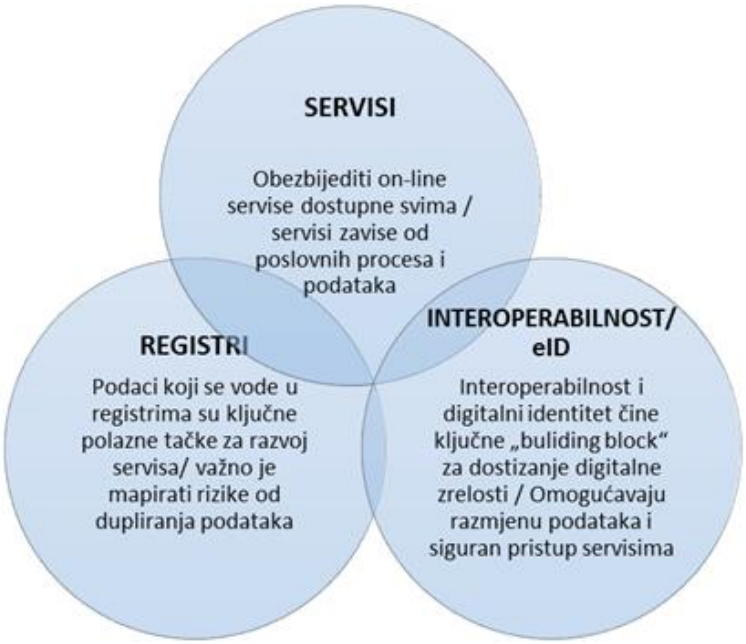
In the process of exchanging information and data, two levels of exchange are recognised: public and closed. The public exchange takes place through the Open Data Portal, while the closed data exchange takes place through SEDES.

State authorities should use data that other government agencies have already collected from individuals and companies, instead of burdening them with seeking the same information several times or collecting information from one government authority just to pass it on to another government authority. Although this exchange of information between authorities is formally legally provided, in practice, it does not happen and therefore it is necessary to standardise and systematise digital databases/registers and the data exchange between them. It is important that all ministries and other state authorities with SEDES, which will require support and guidance from the body responsible for SEDES, as well as taking targeted

measures to motivate ministries and authorities to publish and link registers in accordance with the legal obligation.

Timely access to high-quality data in an easy-to-understand format is also a necessary prerequisite for making better business decisions. In order for companies, organisations and individuals in Montenegro to make good decisions, they need good data from government sources.

Better access to high-quality data can help companies and communities make better decisions, while creating new opportunities for Montenegro to grow and prosper, which is the ultimate goal we want to achieve during the implementation of this Strategy.



Institutions responsible for activities: MPADSM, MESCS, MoI, UZK, MONSTAT

Partners: PKCG, NGO sector, IT community, state authorities and institutions recognised as owners of registers with personal data

Key activities that need to be implemented to achieve this goal have been identified within the priority areas:

- ***Digitalisation of registers and ensuring the accuracy of data through a secure connection, in accordance with the Law on Electronic Government***
- ***Promotion of possibility of usability and innovation based on open data***
- ***IN identification number - the use of which needs to be promoted as a basis for launching e-services to improve the Digital Transformation process***

By drafting a list of technical interoperability standards, establishing new functionalities and developing guidelines for institutions as providers and/or consumers of SEDES services, along with holding workshops to fully implement the Law on Administrative Procedure on the principle of conducting administrative activities in one place will create conditions for institutions to electronically fulfil the obligations of collecting documentation ex officio in a fast and reliable way.

Possibilities of using and functions of open data in order to increase the number of institutions that publish data on the open data portal and increase the number of data sets of "high importance" should be promoted in different ways: showing examples of inspiring practices for innovative use of open data in Montenegro and the EU; maintaining hackathons for business communities and start-ups to create innovative solutions using open data; development of appropriate guidelines for institutions on the manner and importance of publishing data in an open format, etc.

Objective 1.3. Increased coverage and modernisation of electronic communication infrastructure

One of the basic and necessary preconditions for the digitalisation process is to increase the coverage of the population with broadband access (fixed and mobile). Expanding the availability of fixed broadband access with speeds of 100Mbps + as well as the introduction and wider distribution of 5G services are key items for accelerated and quality progress and approaching the goals of the EU document European Gigabit Society by 2025.

Institutions responsible for activities: MED, PKCG, MPADSM, EKIP

Key activities that need to be implemented to achieve this goal are defined within the following fields:

- ***Prescribing goals, measures and models for the development of broadband access, with goals that will be largely in line with the EU document European Gigabit Society by 2025***
- ***Introduction of a high level of 5G network coverage and increased use of Internet access***
- ***Increasing the speed of communication links between key state institutions from 1Gbit/s to 10Gbit/s***
- ***Establishing encrypted communication between key state institutions***

The necessary preconditions are the harmonisation and adoption of appropriate legislation harmonised with the EU legislation, but also the preparation and later implementation of the National Broadband Expansion Plan. Of course, it is necessary to establish a national office for broadband access that would monitor all this. All these activities in the key domain are within the competence of MED. In addition, an indispensable element is the modernisation and improvement of the infrastructure of key state institutions through capacity building and encryption of communication between these institutions in accordance with all applicable standards because data security and availability is a mandatory element in any digital society. This part of the implementation is within the competence of the MPADSM, and one part will be implemented through the ***Cyber Security Strategy 2022-2026***.

Objective 1.4: Development and improvement of digital knowledge and skills of Montenegrin society

The development and improvement of digital knowledge and skills of all population groups is a prerequisite for the digital transformation of a society. On the one hand, the development of electronic services has an effect if citizens have a sufficient level of digital knowledge and skills to be able to use electronic services. Secondly, digitalisation of business processes in public administration is possible if employees have the appropriate level of digital knowledge and skills to conduct processes in this way (process cases received electronically, process requests submitted through the electronic service, etc.). Thirdly, the digitalisation development depends on the IT staff that must be regularly educated and follow the technological changes that occur with the development of technology. Fourthly, obtaining digital knowledge and skills is the basis for encouraging employment, because today it is necessary for every job that the employee has basic knowledge of computer use.

In addition, one of the goals of the Strategy regarding digital skills is to balance between "hard" and "soft" skills. In that sense, when we talk about "hard" skills, we need to engage in two directions: improving the knowledge of engineers for specific areas of IT knowledge needed by the market and retraining highly educated unemployed people for basic technical jobs in the IT industry. This project should be implemented together with ICT and the academia.

Institutions responsible for activities: MESCS, MPADSM, UZK, Agency for Control and Quality Assurance of Higher Education

Partners: PKCG, Employment Agency of Montenegro, ICT clusters, Science and Technology Centre, CSO, UNDP, UNICEF, Adult Education Organisers, PWD Organisations, Universities

Key areas for implementing activities aiming to achieve this goal are:

- ***Improving the formal education system***
- ***Encouraging employability through the establishment of a support system for the acquisition of knowledge and skills***
- ***Improving digital knowledge and skills in public administration as well as empowering civil servants in their education and further career development***
- ***Improving digital knowledge and skills for vulnerable groups of citizens (elderly population, people with disabilities, RE population, etc.) in the process of lifelong learning.***

Improving the formal education system

Digital transformation starts from the transformation, i.e., from the digitalisation of the entire educational system, starting from preschool education to higher education. As for the formal education system, the **Education System Digitalisation Strategy** will cover all levels of education up to higher education, while this strategy will include activities that impact higher education. The main goal of these activities is to change the initial education in many study programs (teacher education, lawyer education, etc.). The change implies changes in study programs that may lead to re-accreditation of study programs. In addition, it is important to pay special attention to increasing the number of students at faculties in the field of IT, which is why it is necessary to develop a scholarship system.

Encouraging employability through the establishment of a support system for the acquisition of knowledge and skills

Reducing the number of unemployed is one of the basic goals of every country. Today, enabling citizens with digital skills is the basic education that needs to be offered to the unemployed because these skills are in demand in almost all jobs, and the level of knowledge depends on the requirements of a particular job. The implementation of trainings for the unemployed is realised through the adult education organisers. In order for citizens to be able to attend adequate training through which they will acquire the necessary level of knowledge and skills for employment, it is necessary to conduct an analysis of the offer on the side of adult education organisers and initiate accreditation of new ones if the analysis shows the need. After that, it is necessary to organise a series of trainings in order to create conditions for potentially new employment, thanks to the acquisition of the required knowledge.

Improving digital knowledge and skills in public administration as well as empowering civil servants in their education and further career development

Activities (Annex 3) related to the improvement of digital knowledge and skills in public administration as well as the empowerment of civil servants in their education and further career development, will be recognised and implemented through the **Public Administration Reform Strategy 2022-2026**, more precisely through Operational Objective Public Administration Attractive Employer - an efficient system of promotion and rewards based on monitoring the results of work, evaluation and continuous improvement.
Levels of digital knowledge and skills in public administration, depending on the workplace, are a prerequisite for successful modernisation and digitalisation of the public sector. Every employee must have basic digital skills, but also specialised in relation to which job they cover and what they need for work. In this regard, it is necessary to create a basic training programme through several modules, which would enable the acquisition of basic knowledge of computer use, word processing programmes, spreadsheet programmes, presentation programmes, Internet use, safe use of technology and online collaboration programmes. Specialised training must be in line with the needs of specific services (finance, law, etc.). In addition, it is necessary to conduct regular training on the use of all application solutions implemented in public administration. Special attention should be paid to personnel with jobs in IT field.

In order to create an efficient, professional, responsible and citizen-oriented public administration, it is necessary to create a systematic and continuous process of professional training and development of employees in the field of digital and complementary skills, and enable their continuous development. Citizens' needs in terms of quality policies, processes and services can be met, and digital Montenegro can be developed only by empowered civil servants, which is why the launch of the **Digital Academy** - a platform for education and connecting of all relevant actors who work on building digital and leadership skills of civil servants, students and vulnerable groups – is of strategic importance. Also, changing the overall work culture, developing product management and "soft" skills as a discipline in working on numerous projects and programmes, using modern tools, will be a completely new learning experience for civil servants, which will be realised through the Digital Academy project and ultimately affect their daily work results.

Adopting the concept of the Digital Academy and developing the Ilijas online education platform, represents a strong impetus to the professional development of employees. However, although the activities of this project will be monitored in particular through the Public Administration Reform Strategy 2022-2026, broader strategic priorities are focused on overcoming the digital divide and continuing education for not only civil servants but also the general public with special reference to marginalised groups. Through the General Programme of the Academy, which may be subject to additional adaptation, trainings/courses for human-cantered design and change management, project management vs. product management, agile management and others will be conducted.

The Academy also aims to include and educate students, marginalised groups and the elderly in the field of digital transformation and skills, aiming to bridge the digital divide and intending that no citizen in Montenegro will be left without the opportunity to acquire skills for the 21st century, despite social, material, demographic and other obstacles they encounter.

One of the goals of the entities involved in the work of the Digital Academy is to motivate students to work in self-organised, multidisciplinary teams on tasks as close as possible to those they will actually meet. Thus, every place of learning will eventually become a place of work, and every place of work will also become a place of learning, which all goes in the direction of developing technical, managerial, personal and social skills, the result of which are:

- "Digital" citizens: people who purposefully and confidently use digital technology to communicate, find information and buy goods/services and perform daily tasks;
- "Digital" civil servants/employees: people who have the ability to evaluate, configure, develop and use complex digital systems;
- "Digital" creators: people who have the skills to build digital technology and innovate in this domain.

Improving digital knowledge and skills for vulnerable groups of citizens (elderly population, people with disabilities, RE population, etc.) in the process of lifelong learning

Modern digital society must be built on the values of equality, inclusiveness, openness, equal opportunities, so it is necessary to integrate activities that reduce digital exclusion in every respect and to plan training for vulnerable groups with regard to improving digital knowledge and skills. Trainings must be tailored to the target groups in terms of dynamics or other educational needs, depending on whether they relate to young people, the elderly, the unemployed, the RE population, PWDs, women, rural citizens and other vulnerable categories, whether they are target groups who are users of electronic services and/or potential candidates for employment. Through this area, the elderly population could be encouraged to use technology in order to use some electronic services more efficiently, such as eHealth for scheduling or ordering prescriptions, and for example persons with disabilities to use technology to increase employment opportunities in administrative jobs, as well as the population categories that may be identified as a vulnerable category in employment.[74]

Operational Objective 2.1: Raising the awareness of citizens and the economy about the importance of digital development

One of the key challenges identified in the digitalisation process is the level of understanding and perception of citizens and the business community on the importance of digital development that is difficult to measure. Digital transformation or digital development of society is a process that requires continuity in implementation, while it is the situation with the COVID-19 pandemic that has contributed to a small change in citizens' awareness of the perception of digitalisation of the processes and their necessity in everyday life. In order to create holistic and sustainable solutions in the digitalisation field, it is necessary to continuously and in close cooperation with various stakeholders (business community, civil society, etc.) implement activities aimed at raising citizens' awareness of the importance and benefits

[74] The envisaged activities are in part complementary to the goal of "Improving the socio-economic and legal position of Roma and Egyptians in Montenegro, promoting an inclusive and open society based on the promotion of equality, combating and eliminating all forms of discrimination, anti-Gypsyism and poverty", recognised by the **Strategy of Roma and Egyptians Inclusion 2025.**

of digitalisation, especially in the field of electronic services created according to the needs of citizens, which would affect their motivation to contribute to purposeful digitalisation.

Institutions responsible for activities: MPADSM, PKCG

Partners: MEK, MoI, MESCS, ZOCG, NVO, UNDP, state authorities that are part of the internal coordinating body as well as the key state authorities of the targeted e-services

Activities that will be implemented in order to promote the importance of digital development and raising awareness of citizens will be implemented through two key areas aimed at the following:

- ***Defining and implementing a unified communication campaign in the field of digital transformation and monitoring the effects of performance***
- ***Increasing the awareness of citizens and the economy about the importance and benefits of digital transformation (through a single communication campaign at the state and local level).***

Establish an internal coordinating body of the state administration for defining and implementing a communication campaign in the field of digital transformation and monitoring the effects of performance

Through the implementation of a group of activities whose realisation it is planned to *establish an internal coordinating body of the state administration for defining and implementing a communication campaign in the field of digital transformation and monitoring the performance effects*, the necessary preconditions for implementing a communication campaign (strategy) in the field of digital transformation for citizens and business community will be created, as well as to define annual communication plans. In this way, the emphasis is on a special communication campaign that would recognise and contribute through one-year communication plans through promotional activities to raise awareness of citizens and the economy about the importance of digital development, and through contribution to promotional activities of all identified key projects through strategy.

The Ministry of Public Administration of Digital Society and Media, as the bearer and coordinator of most of the recognised activities through this measure, will establish an internal coordinating body consisting of all relevant representatives of state administration, which will define “the Communication campaign in digital transformation field for citizens and the economy with the accompanying annual communication plan “as well as monitoring of the performance effects. The key role in this operational goal is the role of the internal coordinating body that will define the umbrella communication campaign, which will monitor the implementation of all activities defined by the strategy through various promotional activities and communication channels, in order to influence change of the digital awareness of citizens and the economy about importance of all segments that are an integral part of digitalisation.

Increasing the awareness of citizens and the economy about the importance and benefits of digital transformation (through a single communication campaign at the state and local level)

Implementation of identified promotional activities and events through direct contact with as many citizens and representatives of the economy as possible, and in order to obtain relevant feedback that is important for further planning of digital society development, will indirectly impact the increase in

awareness of citizens and the economy about the importance and benefits of the society's digital transformations. A much larger number of channels of communication with citizens and the economy, as well as key promotional activities will be identified through a special communication plan and communication campaign after the establishment of the coordinating body, which are activities from the previous measure.

The Ministry of Public Administration, Digital Society and Media, in cooperation with other stakeholders and identified partners, will implement a number of promotional campaigns and activities in order to inform citizens and the economy better. Implementation of the Citizens' and Business Community Satisfaction Survey on Electronic Services in Montenegro and the promotional campaign on the benefits and use of targeted e-services for citizens and the business community are activities identified within the project E-Services and Digital Infrastructure as a Response to COVID 19, and which are implemented in cooperation with the UNDP, and are funded by the Delegation of the European Union. In addition, MPADSM will implement the Caravan of Digital Education for Citizens/Business Community, while within the same measure the event Digital Age Economy will be organised by the Chamber of Commerce of Montenegro.

Operational Objective 2.2: Improving the quality, quantity and use of e-services

The introduction of basic electronic public services is progressing gradually, but not at the speed that users expect. With this operational objective, we strive to increase the availability of key public services in the coming period, while strengthening the adoption of innovative ICTs, and on the other hand to increase the quality of available electronic services and make them more accessible and visible to increase their use. Progress towards this goal is also closely linked to the establishment of a digital identity system that is secure and easy to use. In order to create a better user experience, it is necessary to improve the national eID scheme and through targeted activities to adapt existing but also to **develop new eID systems and mechanisms**. **It is especially necessary to improve the electronic identification system with the use of mobile technologies**.

Institutions responsible for activities: MPADSM, MFSS, MoI

Partners: MZD, UNDP and Operational Team

Key activities that need to be implemented in terms of improving the quality, quantity and use of e-services have been identified through two priority areas:

- ***Development and optimisation of user-oriented electronic services***
- ***Improving the application of eID and electronic trust services in order to further develop and mass use of e-services***

In order to use properly the benefits that the digital society brings, citizens and businesses must be given access to public online services. They should not only be available, but also easily accessible on various devices and platforms, inclusive and user-friendly.

Development and optimisation of user-oriented electronic services

Convenience, accessibility, value and motivation are important aspects of increasing the use of electronic services from both the private and public sectors. For users, convenience means an intuitive and seamless interface and services that are available when needed. The true value of digital services comes with further automation, availability and a clear value offer.

The Montenegro Digital Transformation Strategy 2022-2026 identifies the principles of user-oriented design, placing the user at the centre of digital services development, while the Public Administration Reform Strategy 2022-2026 will establish the measurement of service satisfaction through modern tools for this field. Some of the indicators that can be used in assessing user satisfaction are usefulness, usability, ease of finding, credibility, availability, desirability effect and value.

The Ministry of Public Administration, Digital Society and Media, as the bearer of most activities, will more precisely define the way in which public administration bodies should realise their services in electronic form, through group of activities, by developing a Methodology for Development of User-Oriented Services and by forming an Operational Team to monitor and propose development and optimisation of existing processes in digital form. Furthermore, the establishment of new electronic services, high level of sophistication, for citizens and the economy that will be based on electronic data exchange and/or the possibility of electronic payment through electronic payment systems is an activity that will implement services of importance to citizens and the economy, with the possibility of fully submitting a request to the public administration.

In addition, the Public Administration Reform Strategy 2022-2026 defines the launch of the Montenegro Digital project, aiming at implementing digital transformation at the level of the entire Government, modernising public administration, strengthening internal capacities, optimising IT costs in order to enable sustainable and purposeful development of digital services and the best user experience for citizens, which will:

- ***Define digital standards and standardise technology at the level of the entire Government***
- ***Provide modular procurement and optimise consumption in the area of procurement of IT equipment, software solutions, licenses and implementation of digital solutions***
- ***Create an open digital market***
- ***Agile development of policy processes and platforms according to the needs of citizens***

Improving the application of eID and electronic trust services in order to further develop and mass use of e-services

An important set of activities in the realisation of this operational objective inevitably includes the existence of a widespread and accepted digital identity for all citizens and residents, which is an important prerequisite for the digital transformation of society.

Figure: Three pillars of digital identity implementation

Identity management
Identity management, entry solutions, registration body, governmental and/or other, officially designated identity providers
Tools for identity verification and granting expressed consent – authentication and signature
High security technology for authentication and signature
Integrated services – reliable parties offering secure access, verification and signing of a transaction
Reliable parties that may have benefits out of service using API and integration

In order for electronic public administration services to cover all types of administrative procedures, it is necessary that users can identify themselves in a secure way. This process requires the development of digital identity concepts and tools. Through activities under this measure, **the Ministry of Interior**, which manages key registers that are crucial for the establishment of electronic services for citizens, but also for the digitalisation of other processes requiring identity verification, will work on establishing new electronic services based on user identity verification with a new identity card. In addition to this, the possibility of inspection of the registers kept by this institution will be established by establishing electronic services for inspection of personal data from the registers, as well as checking by users which institution used their personal data.

MPADSM will continue to work on establishing a system for secure identification and authentication of users, through the Single-Sign-On system. In this way, they would ensure raising public awareness of the use of digital identity, and simplify and provide more efficient access of citizens and the economy to all electronic services.

Operational Objective 2.3: Improvement and development of the ICT sector

The growth and development of ICT is identified as a key prerequisite for achieving economic and social development and improving efficiency at the global level. Montenegro has the potential to be competitive in the global market with the IT sector, but in order for this sector to be in the function of digital transformation and economic development, as well as increasing the quality and quantity of IT industry in GDP of Montenegro, Government support measures must aim for it to become a new strong industry with high export potential. Only with adequate support measures, can the IT sector and digitalisation become catalysts for the development of an innovative economy and strengthen traditional industries too.

The Smart Specialisation Strategy 2019-2024 strategic vision of Montenegro's development is based on increasing the competitiveness of the economy, through smart growth, sustainable growth and inclusive growth, focusing on three key strategic goals, one of which is **modernised and digitalised Montenegro**. ICT is defined here as a horizontal sector that provides information technology support to selected priorities, and the development and application of ICT are recognised as crucial factors for economic development[75].

Institutions responsible for activities MPADSM, MFSW, MED, Investments Agency, MoI, academia (universities), Investment and Development Fund of Montenegro, ICT sector

Partners: Business Associations, Innovation Fund of Montenegro, Science and Technology Park of Montenegro, Investment and Development Fund, business sector

Key activities defined in order to support the achievement of this goal are identified within specific categories:

- ***Availability of ICT equipment in order to overcome the digital divide***
- ***Implementation of mechanisms to support the growth and digitalisation of companies' operations***
- ***Digital transformation of organisations (economy, NGOs, education)***
- ***Definition and implementation of a mechanism for the development of an innovative ICT ecosystem***
- ***Increasing exports, internationalisation of ICT companies and increasing the share of domestic ICT companies in international tenders***

Availability of ICT equipment in order to overcome the digital divide

The digitalisation of the economy and society in itself without adequate government leadership cannot erase the differences and gaps between individuals, households, business sectors and geographical areas, rich and poor or different social groups. In order to take steps to overcome part of the social gap and in accordance with the principles of inclusion, equality and accessibility on which the mission of the Ministry of Public Administration, Digital Society and Media is based, this ministry will be responsible for following activities and subsidies, which will support socially vulnerable categories as well as pupils and students, in order to overcome the digital divide and increase the availability of ICT equipment.

Implementation of mechanisms to support the growth and digitalisation of companies' operations

An important set of activities in the realisation of this operational objective should inevitably include the implementation of appropriate mechanisms to support the growth and digitalisation of companies, in the implementation of which key institutions would be the Ministry of Economic Development and the Ministry of Finance and Social Welfare. Some of the identified activities and mechanisms through which the implementation of mechanisms that contribute to supporting the growth and digitalisation of business operations could be implemented during the implementation of this Strategy are:

[75] *Assessments of economic impact of COVID-19 on business sector and development perspectives of Montenegro; UNDP, UNESCO and UN Women, October 2020*

- Exemption of taxes and contributions to newly established IT companies, reduction of income tax by the amount of the company's investments in new services, products and technologies, exemption of taxes and contributions to newly hired IT staff employed for the first time, exemption from taxes and contributions to newly hired IT staff (exemption entitlement would be acquired by companies that have a higher number of employees at the end of the business year compared to the previous year)

- Subsidies for all companies investing in digital transformation (the amount of subsidy depends on the level of development of the company and the complexity of digital transformation it implements, but certainly should not exceed 50% of project value) and subsidies for all companies investing in digital transformation from tax cuts to the company's profits.

Certainly, when defining Action Plans and dynamics of implementation of activities, in addition to the prepared situation analysis from which the objectives of this Strategy originated, important new facts should be taken into account, i.e., current institutional changes and changes in the legal framework and programmes started by the Government of Montenegro, during the period of preparing this Strategy in order to avoid overlap, i.e., to contribute to the realisation of this and other goals in the best possible way with precisely defined activities. Thus, when defining the first Action Plan 2022-2023 of this Strategy, one should have in mind that the implementation of the new Law on Incentives for Research and Innovation began on October 4, 2021, and that it includes IT companies that base their development on innovation. Since the test period of application of this law is in progress, the effects of the implementation of the prescribed measures should be considered, so that new amendments to this law can be proposed after that and/or possibly proposed amendments to some other laws, which apply to IT companies in a broader sense, not just those involved in innovation. At the same time, the Ministry of Finance and Social Welfare planned and started preparing major changes to the entire tax policy, which include a wide range of tax reliefs (e.g. reduction of taxes on IT equipment, reduction of taxes on new employees, etc.) in which IT companies can be partially identified too.

In addition, the **Strategy for Development of Micro, Small and Medium Enterprises in Montenegro 2018 - 2022** envisages the implementation of the activity Subsidies for All Companies Investing in Digital Transformation, through the Digitalisation Support Programme Line within the Programme for Improving Economic Competitiveness, and in order to harmonise strategic framework of Montenegro, this activity, due to overlap, cannot be the subject of the first Action Plan of this Strategy. However, since the Strategy for the Development of Micro, Small and Medium Enterprises expires at the end of 2022, it is necessary to monitor both the results of these activities and future implementation either through one of the sectoral strategies or through the next action plans of the Digital Transformation Strategy. Especially bearing in mind that this sector, due to its specificity and the needs of investing in digitalisation, can hardly fit within the lines defined for it as a small segment of SMEs, and that recognising the IT sector as a special strategic development sector is a key prerequisite for economic and social development and efficiency improvements at the global level.

Digital transformation of organisations (economy, NGOs, education)

Joint participation in ICT projects, through partnerships with academia and scientific organisations, with grants for innovative projects to support cooperation between the research community and the economy,

is one of the prerequisites for broader digital transformation and quality connectivity and action of its actors. The Strategy will also monitor the implementation of regulations concerning facilitations for digital nomads recognised through the ***Programme for Attracting Digital Nomads in Montenegro until 2025***, in order to maintain continuity and map the potentials of attracting deficient staff from abroad, as well as conduct activities to create environment for attracting foreign investment funds to the ICT sector.

Definition and implementation of a mechanism for the development of an innovative ICT ecosystem

By monitoring the number of supported innovative programmes and projects from the ICT sector and incentives for research and innovation in ICT in the field of new technologies in the economy, the implementation of these mechanisms will be controlled and they will be further supported and strengthened through programme activities of the Innovation Fund and Technology Transfer Office.

Increasing exports, internationalisation of ICT companies and increasing the share of domestic ICT companies in international tenders

Activities that include incentives for companies exporting IT services and products, subsidies for study visits abroad in order to conclude new deals on the international market and organise ICT conferences and similar events in Montenegro, were recognised as a necessary but not sufficient prerequisite for true internationalisation ICT companies and increasing the share of domestic ICT companies in international tenders. The Law on Public Procurement does not prohibit the association of domestic companies and joint participation in international tenders, but on the other hand, institutions do not encourage this type of partnership when calls are published through appropriate conditions and ways in which bids are assessed.

VI DESCRIPTION OF ACTIVITIES OF COMPETENT AUTHORITIES AND BODIES FOR MONITORING STRATEGY IMPLEMENTATION

The key institutions identified in the implementation of activities through the identified operational objectives of the Strategy are: Government of Montenegro/Secretariat General of the Government of Montenegro, Ministry of Public Administration, Digital Society and Media, Ministry of Education, Science, Culture and Sports, Ministry of Interior, Ministry of Economic Development , Ministry of Finance and Social Welfare, Agency for Electronic Communications and Postal Services, Chamber of Commerce of Montenegro, Human Resources Administration, Statistical Office of Montenegro - MONSTAT, Personal Data Protection Agency, Agency for Quality Control and Quality Assurance of Higher Education, Investment Agency , Investment and Development Fund, academic and IT community.

The Ministry of Public Administration, Digital Society and Media is tasked with creating public policy that regulates the public administration system in Montenegro and implements digital transformation. The basic precondition for the realisation of strategic and operational goals, defined by the Montenegro Digital Transformation Strategy 2022-2026 is the consistent implementation of activities prescribed by the action plans for the Strategy implementation. After the adoption of the Strategy and the accompanying Action Plan, one of the identified activities is the formation of the Digitalisation

Commission to monitor the implementation of the Strategy, while the Ministry of Public Administration, Digital Society and Media as a key bearer of the digitalisation process participates in the implementation of most activities under all operational objectives identified by the strategy.

The Ministry of Education, Science, Culture and Sports is tasked with planning, implementing and improving education policy as well as implementing key accredited programmes in order to acquire knowledge and skills. One of the basic factors of digital transformation is the development of digital skills and competencies of all groups of the population, which means that the Ministry of Education, Science, Culture and Sports participates in many activities identified in the measures "Improving the formal education system" and "Encouraging employability through the establishment of a support system for the acquisition of knowledge and skills".

The Ministry of the Interior manages key registers that are crucial for the establishment of electronic services for citizens, but also for the digitalisation of other processes that require identity verification, and through this strategic document it participates in the implementation of numerous activities identified in measures "Development and optimisation of user-oriented electronic services" and "Improving the application of eID and electronic trust services in order to further develop and mass use of e-services".

The Ministry of Economic Development, with the priority of investing in development and innovation by implementing innovation policies in order to strengthen knowledge-based economic development, and through facilitations and subsidies overall contributes to the digital transformation of society by implementing activities identified in the measures Implementation of mechanisms to support the growth and digitalisation of companies' operations, development of an innovative ICT ecosystem, digital transformation of organisations and increasing exports, internationalisation of ICT companies and increasing the share of domestic ICT companies in international tenders.

The Ministry of Finance and Social Welfare is responsible, inter alia, for preparing proposals for economic policy of Montenegro, and through amendments to numerous regulations and implementation of various mechanisms to support digital transformation of organisations, it participates in the implementation of activities identified through measures Implementation of mechanisms to support the growth and digitalisation of companies' operations, development of an innovative ICT ecosystem, as well as increasing the share of domestic ICT companies in international tenders.

The Agency for Electronic Communications and Postal Services, in accordance with the competencies prescribed by the Law on Electronic Communications and the Law on Postal Services, has a significant role in implementing activities, especially those related to the development of electronic communications infrastructure, availability of electronic communications services and timely introduction of new technologies by registered operators.

The Chamber of Commerce of Montenegro participates in the organisation of expert discussions with the business sector in order to determine the needs of entrepreneurs, proposing members for working groups, providing expert opinions and, above all, organising key events in the society digitalisation field. The role of the Chamber of Commerce through the strategic document was recognised during the process of document preparation, initiating and forming a Consultative Group of business representatives, which contributed to the quality of the document, and participates in the implementation of activities recognised under measures of preparing certain analyses as well as organising events aimed at raising awareness of the economy about the importance and benefits of digital transformation.

The Human Resources Administration has a role to support, inter alia, public administration reform, guided by the basic principles of efficient and effective service-oriented public administration in order to establish a modern service and as initiator of changes in human resources management field to participate in implementation of numerous activities contributing to improvement of digital knowledge and skills in public administration as well as empowering civil servants in their education and further career development.

The Statistical Office of Montenegro – MONSTAT, as the competent body for the production of official statistics with the role of official statistics holder in the Montenegrin statistical system ,participates in the implementation of activities through the establishment of a system for monitoring key indicators of digital transformation through regular reporting at the national level.

VII MONITORING, REPORTING AND EVALUATION

In accordance with the Methodology of Policy Development, Development and Monitoring of Strategic Documents Implementation, the Montenegro Digital Transformation Strategy 2022-2026 defines a plan for monitoring, reporting and evaluation.

Monitoring will ensure regular collection and analysis of data on the achievement of goals and results during the implementation of activities. Specifically, it will be focused on the Action Plan and the implementation of annual activities envisaged by the plan. The Activity Implementation Monitoring Report will mainly address result indicators with reference to performance indicators, if such data would be available.

Institutions identified through the Strategy and through the Action Plan as well as through the document Passport of Indicators will monitor individual objectives and related indicators. Institutions tasked with implementing the activities from the Montenegro Digital Transformation Strategy 2022-2026 shall submit to the Ministry of Public Administration, Digital Society and Media (MPADSM) data on the level of implemented activities from the Action Plan for previous year, by the end of January of the current year. In the next four-year period, they will report to MPADSM and submit all the necessary data requested by the Ministry, as the managing institution for the digitalisation process.

A Commission for Monitoring Implementation of Montenegro Digital Transformation Strategy will be formed to monitor the implementation of the Strategy and monitor the quality and dynamics of planned activities, whose members, in addition to representatives of the Ministry of Public Administration, Digital Society and Media, can be, as needed, representatives of the following institutions, whose activities were identified in the Strategy: the Ministry of Interior, Ministry of Economic Development, Ministry of Finance and Social Welfare, Ministry of Education, Science, Culture and Sports and the Chamber of Commerce of Montenegro. The Commission will be formed after the adoption of the Strategy.

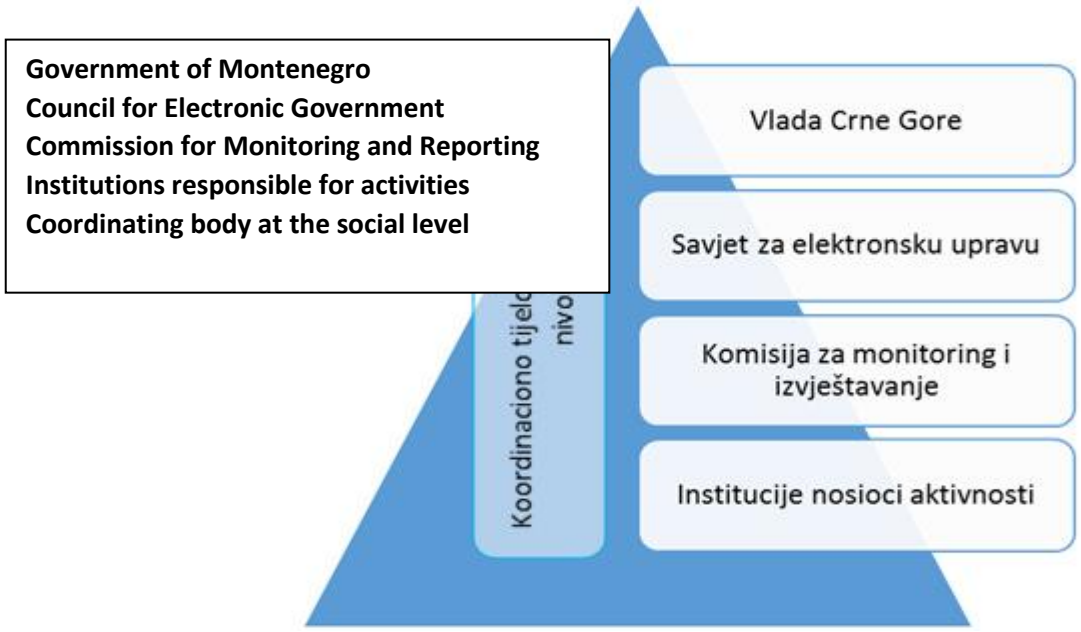
In addition, in June 2021, the Council for Electronic Government was established, with a changed concept and composition of members in relation to the previous one. The innovation of this advisory body was

necessary, given the scope and importance of digitalisation of processes and development of e-government in the coming period and its work will focus on activities carried out by public administration bodies to achieve operational goals, which are the basis of this strategic document. The tasks of the Council for Electronic Government defined by the Law on Electronic Government are to:

- inform the Government of Montenegro on all important issues related to the development of electronic government and information and communication technologies;
- direct, coordinate and monitor activities related to the development of e-government, between state authorities, state administration bodies, local self-government bodies, local government bodies and other bodies, in accordance with Articles 1 and 2 of the Law on Electronic Government;
- consider expert issues in the field of information and communication technologies, related to the development of electronic government;
- consider draft regulations, secondary legislation, strategic, planning and other documents in the field of e-government and information and communication technologies, in order to digitally transform Montenegro;
- initiate changes in the existing legislation in the field of digitalisation and e-government;
- propose measures for harmonisation of the legislative and administrative framework in order to improve the development of e-government;
- work on improving cooperation in the field of electronic administration and information and communication technologies between state authorities, state administration bodies, local self-government bodies, local government bodies and other bodies, in accordance with Articles 1 and 2 of the Law on Electronic Government;
- work on the improvement of international cooperation in the field of electronic administration and information and communication technologies;
- form operational and professional working teams, as temporary bodies, if necessary;
- submit a report on its work to the Government of Montenegro, at least once a year

Professional and administrative support for the work of the Council for Electronic Government will continue to be provided by MPADSM.

In addition to this, the Strategy envisages, within the objective 1.1. Efficient and effective coordination and monitoring of digital transformation, in accordance with EU recommendations and examples of good practice from countries in the region, the establishment of a broad coordinating body at the social level that would bring together all structures and sectors of society (public, business, NGO and academia) with the aim to monitor and improve the digital transformation process. The founding acts of this body will regulate clearly and precisely the manner of coordination between state authorities, economy, science and academia and the civil sector in the service of contributing to the digital transformation process, as well as the specific role and contribution of all sectors to the Strategy monitoring process.



Digital transformation process management and monitoring system

The implementation of the Montenegro Digital Transformation Strategy will be realised through two action plans, the first of which is for the period from 2022 to 2023 and the second from 2024 to 2025. The action plans will contain an overview of the activities required to achieve the operational objectives, as well as the bearers of activities and partners for each of them, deadlines for implementation, performance indicators, as well as the amount of funds and the method of financing.

MPADSM is tasked with gathering data and preparing annual reports on the implementation of the Action Plan within the Commission for Monitoring Implementation of Montenegro Digital Transformation Strategy, which will serve to identify possible delays in the implementation of activities and make recommendations for overcoming them. The annual report will be prepared in accordance with the Methodology of Policy Development, Preparing and Monitoring of Strategic Documents Implementation and it will contain the following elements:

- Short introductory summary with a general assessment of the implementation of the strategic document
- Specific values and fulfilment of result indicators (and performance indicators if available)Information on financial resources spent, in relation to the plan, with sources of financing
- Identified challenges and recommendations for more efficient realisation of objectives
- Changes, if any, in the deadlines for achieving the goals
- Gantt chart or other tabular presentation of achieved goals.

In order to create an objective report, various data sources will be used - starting with data provided by relevant institutions, materials prepared for the Government, reports on the implementation of the authorities work programmes, interviews with contact persons, NGO materials, as well as research and reports of international organisations. All reports will be presented to the Council for Electronic

Government for adoption and to the Secretariat General of the Government of Montenegro for opinion. After the adoption by the Government, if the need arises, the MPADSM will update the Action Plan by the end of May this year at the latest. In addition to the annual reports, the MPADSM will also, within the Commission for Monitoring Implementation of Montenegro Digital Transformation Strategy, prepare the Final Report on the Implementation of the Strategic Document. The reports will also be published on the website of the Ministry of Public Administration, Digital Society and Media.

In order to determine the relevance and fulfilment of goals, efficiency of development, effectiveness, impact and sustainability of the strategy, in accordance with the Methodology, the evaluation of the strategic document is envisaged. The final evaluation will be conducted at the end of the implementation period, to assess the effects and performance of the Montenegro Digital Transformation Strategy 2022-2026, with an initial Situation Analysis for the adoption of the next strategic document. A combined method will be used to ensure objectivity in conducting the evaluation, and will be conducted by an independent expert, while the process will be coordinated by the MPADSM. Funds will be allocated, approved and used for these purposes in the budget of the Ministry of Public Administration, Digital Society and Media, which will be provided from the Government budget in the amount of up to €30,000. The evaluation will focus primarily on the achievement of objectives and performance indicators, and the report will be discussed at the Council for Electronic Government, and will be submitted to the Government through the GSV for adoption.

Financial Framework

The Montenegro Digital Transformation Strategy, i.e., its individual activities, will be financed from the budget, donor funds and funds provided through IPA 2020. Through the Action Plan for 2022-2023, to achieve all operational objectives, spending in the total amount of €4,433,420 is envisaged, while the next Action Plan for 2024-2025 will define the remaining financial resources.

The 2022 budget envisages financial resources for the implementation of the Montenegro Digital Transformation Strategy 2022-2026, in proportion to the defined activities and the necessary financial resources for their implementation.

Out of the total amount, the planned funds from donations amount to €1,171,420.

DONATION AMOUNT:	€1,171,420.00
AMOUNT FROM THE BUDGET:	€3,262,000.00
TOTAL BUDGET:	€4,433,420.00

VIII COMMUNICATION OF THE STRATEGY

The degree of understanding and perception of the digital development of society is difficult to measure, but it is one of the key challenges in the digitalisation process that is recognised in the cultural and sociological environment.

Due to the importance of digital development as a crucial horizontal factor for the whole economy and society, successful solving of this challenge is one of the focuses of the Strategy, which needs to be addressed using communication, anthropological and sociological approaches, but also other, non-IT expertise that can contribute to building affirmative attitude towards digital development.

In order to provide conditions for efficient and effective implementation of the Strategy, the process of policy communication of key actors in all sectors, the scientific community and the general public is of strategic importance.

Policy communication enables all actors and the public to understand policy cycles, identified goals as well as planned results, but also to ensure the participation of all necessary human and institutional resources, including the media. In this context, the Ministry of Public Administration, Digital Society and Media will seek to use both available and new mechanisms to ensure full understanding and acceptance of the policy at all levels of implementers, both existing and future policy users.

In order for the digital transformation of society in Montenegro to be successful, it is necessary to have involvement and active participation of a significant number of stakeholders, both those identified as direct bearers of the digitalisation process (internal public) and those targeted through contributing to increasing influence, change of opinion and greater mobilisation within the process of digital transformation - the external public. The internal public consists of employees in state administration and local self-government, while the external target public consists of the general public (citizens), media, NGOs, representatives of the economy, trade unions, academia and international organisations.

The practice is that the basic communication activities are mainly focused on three key channels: media relations, social networks (e.g. Facebook and Instagram page of the Ministry) and the official website of the institution. In order to raise public awareness and increase understanding of the needs and benefits of digital transformation of society, as well as to ensure a stronger effect of implementing promotional and communication channels, the Strategy identified the need to establish an internal coordinating body for defining and implementing communication campaigns in the field of digital transformation and monitoring performance effects. In this way, the initiated processes will be communicated through the so-called "umbrella" communication campaign that would identify various promotional and communication channels and activities through one-year communication plans and activities that would be implemented in order to improve the digital awareness of citizens and the economy. It is clear that digital transformation is no longer a matter of choice today and represents much more than the use of modern technology and internet tools. It is, in fact, a flexibility to adapt to changes that have never happened faster, and that is why we must help all citizens to adapt faster, master the necessary knowledge and skills and make the most of these changes, with all the benefits they can bring to them.

IX ACTION PLAN 2022-2023.

STRATEGIC GOAL I

Improving the capacity and capability for digital transformation of Montenegro

OPERATIONAL OBJECTIVE 1.1.	Efficient and effective coordination and monitoring of digital transformation		
Indicator	**Baseline value**	**Target value by 2024**	**Target value by 2026**
Percentage of proposals accepted by the national coordinating body, out of the total number proposed by the sectoral coordinating bodies	0	70%	100%
Percentage of conclusions adopted by the Government of Montenegro based on the recommendations of the national coordinating body	0	80%	100%

Activity impacting Operational objective implementation		Result Indicator	Competent institutions	Activity start date	Activity end date	Funds planned for activity implementation	Financing source
1.1.1	Establishment of a national coordinating body at the social level in order to improve the	National coordinating	Government of Montenegro at the initiative of	First quarter 2022	Second quarter 2022	No funds needed	

	process of digital transformation of Montenegro	body at the social level established	PKCG, AmCham, MMA, Foreign Investors Council				
1.1.2	Preparation of an analysis of the existing management, advisory, infrastructure at the level of public administration relevant to the process of digitalisation and digital transformation, with a recommendation for the improvement of the Council for Electronic Government	The Analysis from the recommendation prepared	Secretariat General of the Government of Montenegro with competent ministries (working group)	Second quarter 2022	Third quarter 2022	No funds needed	
1.1.3	Establishing and work of the commission for monitoring implementation and monitoring of the Montenegro Digital Transformation Strategy	Commission established Number of reports on Digital Transformation Strategy implementation	MPADSM	First quarter 2022	Fourth quarter 2023	€25,000	Budget of Montenegro
1.1.4	Amending the Decision on the supplement to the basic salary for performing task in	Decision Amended	Ministry of Finance and Social Welfare MPADSM	Third quarter 2022	Fourth quarter 2022	n/a	Budget of Montenegro

	certain jobs (Official Gazette of Montenegro No. 60/17, 36/18, 59/19, 28/21) in order to identify jobs in the field of ICT						
1.1.5	Preparation of an analysis of the existing personnel and technical-technological infrastructure with a proposal for defining the optimal organisational form for the operational implementation of IT development and support in public administration	Analysis prepared, with recommendations for the optimal organisational form and strengthening of existing capacities	MPADSM GSV	Fourth quarter 2022	First quarter 2023	No funds needed	
1.1.6	Establishing continuous monitoring of key digital transformation indicators through regular reporting at the national level	List of indicators defined and continuous measurement for them established	MONSTAT MPADSM	First quarter 2022	Fourth quarter 2022	No funds needed	

OPERATIONAL OBJECTIVE 1.2.	**Improving data availability, interoperability and management**

Indicator	Baseline value	Target value by 2024	Target value by 2026
Number of institution[76] that published data on the Open Data Portal	**20**	**100**	**200**
Number of electronic registers in the meta - register	**12[77]**	**80**	**150**
Percentage of eServices kept in the catalogue of e-government services, which can collect data from more than one register per query	**n/a**	**10% of all electronic services from the e-services catalogue**	**20% of all electronic services from the e-services catalogue**

FIELD	**Digitalisation of registers and ensuring the accuracy of data through a secure connection, in accordance with the Law on Electronic Government**

Activity impacting Operational objective implementation		**Result Indicator**	**Competent institutions**	**Activity start date**	**Activity end date**	**Funds planned for activity implementation**	**Financing source**
1.2.1.	Establish electronic records of all registered maintained in institutions which identified activity bearers supervise (in order to form sectoral registers	Number of records of sectoral registers	PKCG MESCS MoH MED MIF	Fourth quarter 2022	Fourth quarter 2023	No funds needed	

[76] Who have to comply with the Law on Free Access to Information

[77] Number of registers logged in meta-register

	and their logging to Metaregistar)		EKIP CBCG				
1.2.2	Holding trainings and workshops to fully implement the Law on Administrative Procedure on the principle of conducting administrative activities in one place (Obligation of collecting documentation ex officio and electronically	Number of trainings, workshops etc. held	UZK MPADSM	First quarter 2022	Fourth quarter 2023	€10,000	Budget of Montenegro
1.2.3	Preparing analysis of the current state of the system aimed to make automation more efficient and easier use of SEDES	Analysis prepared	MPADSM	First quarter 2022	Second quarter 2022	15.000 €	DEU donation
1.2.4	Establishing new functionalities of the SEDES system based on analysis conducted	Number of queries by citizens for inspection of their data Inspection of special systemic records enabled – to check	MPADSM	Second quarter 2022	Fourth quarter 2023	No funds assessment possible until Analysis is prepared	DEU donation

		whether anyone unauthorised reviews data on citizens					
1.2.5	Preparation of the list of technical interoperability standards (including users' demographic characteristics)	List prepared	MPADSM	First quarter 2022	Third quarter 2022	€10,000	Budget of Montenegro
1.2.6	Develop guidelines in the form of a guide for institutions, as SEDES services providers or users (in accordance with DEI principles)	Guidelines prepared	MPADSM	Second quarter 2022	Fourth quarter 2022	€3,000	Budget of Montenegro
FIELD		**Promotion of possibility of usability and innovation based on open data**					
Activity impacting Operational objective implementation		**Result Indicator**	**Competent institutions**	**Activity start date**	**Activity end date**	**Funds planned for activity implementation**	**Financing source**
1.2.7	Improvement of guidelines for publishing data in open format	Guidelines improved	MPADSM	Third quarter 2022	First quarter 2023	€2,000	Budget of Montenegro

1.2.8	Holding hackathons for business communities and start-ups to create innovative solutions using open data	One hackathon held	MPADSM PKCG	Third quarter 2023	Third quarter 2023	€6,000	Budget of Montenegro
1.2.9	Identifying and publishing inspiring practices for innovative use of open data in Montenegro and the European Union	Online document published: Overview of innovative practices accompanied with information with recommendations for improvement of using open data in Montenegro	MPADSM in cooperation with NGO sector, IT community	Fourth quarter 2023	Fourth quarter 2023	€1,000	Budget of Montenegro
FIELD		**Identification number**					
Activity impacting Operational objective implementation		**Result Indicator**	**Competent institutions**	**Activity start date**	**Activity end date**	**Funds planned for activity implementation**	**Financing source**
1.2.10	Harmonisation of legislation, governing personal identity of citizens, in order to identify use of IN	Legislation harmonised	MoI MPADSM	Third quarter 2022	Fourth quarter 2023	No funds needed	

1.2.11	Establishing electronic service of IN inspection by citizens	Electronic service established	MoI	First quarter 2022	Third quarter 2022	No funds needed	

OPERATIONAL OBJECTIVE 1.3.	**Increased coverage and modernisation of electronic communication infrastructure**					
Indicator[78]		**Baseline value**	**Target value by 2024**	**Target value by 2026**		
Share of citizens using the Internet		**82,2,6%**	**86%**	**89%**		
Percentage of household coverage with fixed BB at the speed of 100Mbps +		**76,7%**	**81.6%**	**86,4%**		
Percentage of population coverage by mobile BB at the speed of 10 Mb / s +		**97,2%**	**98%**	**99%**		
FIELD	**Development of broadband access in line with the EU document European Gigabit Society by 2025**					
Activity impacting Operational objective implementation	**Result Indicator**	**Competent institutions**	**Activity start date**	**Activity end date**	**Funds planned for activity implementation**	**Financing source**

[78] The stated target values of the indicators should be updated after the completion of the National Plan for Development of High Speed Broadband Networks and the development of the Strategy/Plan for the introduction of 5G in Montenegro

1.3.1	Establishing National Plan for Development of High Speed Broadband Networks	National Plan for Development of High Speed Broadband Networks established	Ministry of Economic Development (MED)	First quarter 2022.	Fourth quarter 2022.	€20,000	Budget of Montenegro
1.3.2	Harmonisation with EU legislation: Transposition and efficient implementation of the EU Directive on reducing costs of broadband access 2014/61/EU	The Law on Using Physical Infrastructure for Installation of Electronic High-speed Communication Networks Adopted	MED	Second quarter 2021	Fourth quarter 2021	No funds needed	
1.3.3	Transposition and efficient implementation of the EU Directive on establishing the European Electronic Communication Code 2018/1972	The Law on Electronic Communications adopted	MED	First quarter 2022	Fourth quarter 2022	€20,000	Budget of Montenegro
1.3.4	Establishing National Office /Directorate for broadband Internet Access	National Office /Directorate for Competitiveness in Broadband Access Field	MED	First quarter 2022	Fourth quarter 2022	No funds needed	
FIELD		**High level of 5G network coverage and increased use of Internet access**					

Activity impacting Operational objective implementation		Result Indicator	Competent institutions	Activity start date	Activity end date	Funds planned for activity implementation	Financing source
1.3.5	Preparation of Strategy/Plan for Introducing 5G in Montenegro	Strategy/Plan for Introducing 5G in Montenegro prepared	MED	First quarter 2022	Fourth quarter 2022	€20,000	Budget of Montenegro
1.3.6	Preparation of comparative analyses of prices of Internet access services prices for residential and business users in the regional and EU countries with recommendations for corrections if needed	Analyses with recommendations prepared	PKCG EKIP MED	Third quarter 2022	First quarter 2023	No funds needed	Budget of Montenegro
1.3.7	Allocation of radio frequencies from the 5G-intended ranges	The procedure for allocation of radio frequencies from the 5G-intended ranges conducted	EKIP MED	First quarter 2022	Fourth quarter 2022	€170,000	Budget of EKIP
1.3.8	Preparation of a study on designating of minimum amount of lump for granting approval to use radio frequencies	Study prepared	MED EKIP	First quarter 2022	Second quarter 2022	€30,000	Budget of Montenegro

FIELD		Speed of communication links between key state institution					
Activity impacting Operational objective implementation		Result Indicator	Competent institutions	Activity start date	Activity end date	Funds planned for activity implementation	Financing source
1.3.9	Preparation of a technical plan for increasing communication links' speed with approximate budget estimation	Technical plan prepared and budget estimated	MPADSM	Second quarter 2022	Third quarter 2022	No funds needed	
1.3.10	Technical implementation of 10Gbit/s communications	Number of institutions with which 10 Gbit/s communication is established	MPADSM	Second quarter 2023	Third quarter 2023	€200,000	Budget of Montenegro
FIELD		Encrypted communication between key state institutions					
Activity impacting Operational objective implementation		Result Indicator	Competent institutions	Activity start date	Activity end date	Funds planned for activity implementation	Financing source

1.3.11	Preparation of a technical plan for establishing encrypted communication between key state institutions with approximate budget estimate	Technical plan prepared and budget estimated	MPADSM	Second quarter 2022	Third quarter 2022	No funds needed	
1.3.12	Technical implementation of establishing encrypted communication	Number of institutions with which encrypted communications was established.	MPADSM	Second quarter 2023	Third quarter 2023	€100,000	Budget of Montenegro

OPERATIONAL OBJECTIVE 1.4.	**Development and improvement of digital knowledge and skills of Montenegrin society**		
Indicator	**Baseline value**	**Target value by 2024**	**Target value by 2026**
Percentage of graduates of study programmes in the IT field in relation to the total number of graduate students at all universities	**8%**	**12%**	**15%**
Number of trained citizens from a vulnerable group of citizens who attended ICT trainings with adult education organisers	**0**	**300**	**600**
FIELD	**Improving the formal education system**		

Activity impacting Operational objective implementation		Result Indicator	Competent institutions	Activity start date	Activity end date	Funds planned for activity implement ation	Financing source
1.4.1	Accreditation /reaccreditation of study programmes	Number of accredited/reaccredited study programmes	Agency for Control and Quality Assurance of Higher Education, Universities	First quarter 2022	Fourth quarter 2023	€30,000	Budget of Montenegro
1.4.2	Creating scholarship model for ICT programmes students	Scholarship model created	MESCS, MPADSM, PKCG, ICT clusters, Science and technology centre	First quarter 2022.	Second quarter 2022	€2,500	Budget of Montenegro
1.4.3	Providing scholarships for students from the ICT field	Number of students granted scholarship	MESCS, MPADSM, ICT clusters, PKCG, Science and technology centre	Second quarter 2022	Fourth quarter 2023	€36,000	Budget of Montenegro
FIELD		**Encouraging employability through the establishment of a support system for the acquisition of knowledge and skills**					
Activity impacting Operational objective implementation		**Result Indicator**	**Competent institutions**	**Activity start date**	**Activity end date**	**Funds planned for activity**	**Financing source**

						implementation	
1.4.4	Implementing one-stop-shop model for 75 young people with emphasise on digital skills improvement	Number of young people trained	MPADSM NVO	First quarter 2022	Second quarter 2022	€91,420	EC donation
1.4.5	Preparation of analysis of the programme offer from ICT field by adult education organisers	Report on analysis of the programme offer from ICT field by adult education organisers	MESCS, MPADSM, CSO, adult education organisers	First quarter 2022.	Second quarter 2022	€2,000	Budget of Montenegro
1.4.6	Creating and accreditation of new training programmes in the ICT field by adult education organisers	Number of new programmes accredited	MESCS, MPADSM, CSO, PKCG, ICT cluster, adult education organisers	Third quarter 2022	Fourth quarter 2022	€20,000	Budget of Montenegro
1.4.7	Implementation of training programmes in the ICT field by adult education organisers	Number of persons trained in the ICT field	MPADSM, ZZZCG, adult education organisers	First quarter 2023.	Fourth quarter 2023	€70,000	Budget of Montenegro
1.4.8	Preparation of an analysis establishing the existing level of knowledge and skills in	Analyses prepared	MPADSM UNDP	Third quarter 2022	Second quarter 2023	€50,000	Donor support

	STEM and digital transformation fields						
FIELD		**Digital knowledge and skills for vulnerable groups of citizens (elderly population, people with disabilities, RAE population, etc.) in the process of lifelong learning**					
Activity impacting Operational objective implementation		**Result Indicator**	**Competent institutions**	**Activity start date**	**Activity end date**	**Funds planned for activity implementation**	**Financing source**
1.4.9	Implementation of training for persons with disabilities in ICT field	Number of persons trained	MPADSM, Adult education organisers	First quarter 2023	Fourth quarter 2023	€42,000	Budget of Montenegro
1.4.10	Implementation of training for the elderly in ICT field	Number of persons trained	MPADSM, Adult education organisers	First quarter 2023	Fourth quarter 2023	€42,000	Budget of Montenegro
1.4.11	Implementation of training for RE population in ICT field	Number of persons trained	MPADSM, Adult education organisers	First quarter 2023	Fourth quarter 2023	€14,00	Budget of Montenegro
1.4.12	Implementation of trainings for persons with disabilities for using options of eAccessibility on the gov.me portal	Number of persons trained	MPADSM, PWD organisations	First quarter 2022	Fourth quarter 2023	€1,500	Budget of Montenegro

STRATEGIC GOAL II

Strengthening Digital Awareness of Montenegrin Society and Digital Competitiveness of ICT sector

OPERATIONAL OBJECTIVE 2.1	Raising the awareness of citizens and the economy about the importance of digital development		
Indicator	**Baseline value**	**Target value by 2024**	**Target value by 2026**
Percentage of state bodies actively involved in the communication campaign	**/**	**50% of state authorities in relation to the total number**	**75% of state authorities in relation to the total number**
Percentage of citizens informed about the availability and use of electronic services	**22% of citizens consider themselves mostly or fully familiar with electronic services**	**45% of citizens consider themselves mostly or fully familiar with electronic services**	**65% of citizens consider themselves mostly or fully familiar with electronic services**
Percentage of the economy informed about the availability and manner of using electronic services[79]	**87% of economy consider themselves mostly or fully familiar with electronic services**	**90% of economy consider themselves mostly or fully familiar with electronic services**	**95% of economy consider themselves mostly or fully familiar with electronic services**

[79] Survey with citizens and companies regarding the use and attitudes towards e-services in Montenegro, IPSOS / UNDP, 2019

FIELD		Defining and implementing a unified communication campaign in the field of digital transformation					
Activity impacting Operational objective implementation		**Result Indicator**	**Competent institutions**	**Activity start date**	**Activity end date**	**Funds planned for activity implementation**	**Financing source**
2.1.1	Establishing an internal coordinating body of the state administration for defining and implementing a communication campaign	Coordinating body established	MPADSM (PR department)	First quarter 2022	Second quarter 2022	No funds needed	
2.1.2	Preparation of guidelines for preparing communication campaigns in accordance with DEI principles	Number of gendered communication campaigns	MPADSM	First quarter 2022	Fourth quarter 2022	€5,000	UNDP donor funds
2.1.3	Preparation of Communication campaigns in the digital transformation filed for citizens and the economy	Communication Campaign and accompanying Communication Plan (CP)	MPADSM (coordinator) + other state authorities as part of the internal coordinating body + PKCG	Second quarter 2022	Third quarter 2022	€10,000	Budget of Montenegro

			+NGO + external expert (communicati on expert)				
2.1.4	Implementing activities from the communication campaign	Number of promotional activities implemented	MPADSM	Fourth quarter 2022	Fourth quarter 2023	€100,000	Budget of Montenegro
FIELD		**Awareness of citizens and the economy about the importance and benefits of digital transformation**					
Activity impacting Operational objective implementation		**Result Indicator**	**Competent institutions**	**Activity start date**	**Activity end date**	**Funds planned for activity implementa tion**	**Financing source**
2.1.5	Conducting the citizens' and business community satisfaction survey on electronic services in Montenegro	Number of surveys conducted	MPADSM UNDP	First quarter 2022	Fourth quarter 2022	€70,000	DEU donation
2.1.6	Organisation of caravans of digital education for citizens and business community	Number of caravans organised (by regions)	MPADSM, ZO, NGO	Third quarter 2022.	First quarter 2023.	€10,000	Budget of Montenegro

2.1.7	Development of promotional campaigns based on the results obtained by conducting surveys on citizens and business community satisfaction (decreasing digital gender divide, benefits of using targeted e-services for citizens and business community)	Number of video materials /info graphics for targeted e-services Number of campaigns for decreasing digital gender divide	MPADSM, key state administration bodies of targeted e-services, UNDP	First quarter 2022.	First quarter 2023.	€65,000	DEU donation
2.1.8	Organising events peer to peer mission: Digital age economy	One peer to peer mission held	PKCG, MPADSM, MED, ZO, NVO	Fourth quarter 2022.	Fourth quarter 2022.	€2,500	Budget of PKCG
2.1.9	Preparation of campaigns for promoting importance of digitalisations and use of new ID cards for citizens and business community	Campaign prepared and implemented	MPADSM, MoI, UNDP	First quarter 2022.	Second quarter 2022	n/a	United Kingdom Embassy donation

2.1.10	Organising promotional lecture in schools – Girls from ICT for girls in ICT	Number of lectures organised	PKCG MESCS	Third quarter 2022	Fourth quarter 2023	No funds needed	
2.1.11	Organising events /visits to ICT companies, where women mostly operate, for groups of 10 girls	Number of lectures organised	PKCG MESCS	First quarter 2022	Fourth quarter 2023	€500	Budget of PKCG

OPERATIONAL OBJECTIVE 2.2	**Improving the quality, quantity and use of e-services**		
Indicator	**Baseline value**	**Target value by 2024**	**Target value by 2026**
Online Services Index (OSI)	**0,5412**	**10%**	**20%**
Share of unique users who used an ID card for identification/signature when using electronic services	**n/a**	**20%**	**50%**
Number of users of electronic identification and trust services (excluding the Ministry of the Interior)	**20.519[80]**	**22.570**	**27.084**
FIELD	**Development and optimisation of user-oriented electronic services**		

[80] As of December 23, 2020

Activity impacting Operational objective implementation		Result Indicator	Competent institutions	Activity start date	Activity end date	Funds planned for activity implementation	Financing source
2.2.1	Establishing Operational Team for e-services development and interoperability	Interagency operational team established	MPADSM	First quarter 2022	Second quarter 2022	No funds needed	
2.2.2	Preparation of methodology at the level of state and local administration for standardisation and development of user-orientated e-services	Methodology prepared	MPADSM + Operational Team	Second quarter 2022	Fourth quarter 2022	€30,000	Budget of Montenegro (10.000,00) DEU donation (20.000,00)
2.2.3	Defining guidelines for reporting on electronic services of the public administration to MPADSM	Guidelines defined and adopted	MPADSM	First quarter 2023	Fourth quarter 2023	€2,500	Budget of Montenegro

2.2.4	Establishing new electronic services, of high sophistication level, for citizens and the economy, which will be based on electronic data exchange and/or possibility of electronic collection through the electronic payment system (NSNAT)	Number of electronic services of high sophistication level	MPADSM UNDP	First quarter 2022	Fourth quarter 2023	€280,000	DEU donation
2.2.5	Establishing service for reporting birth and death through which health institutions would electronically submit requests to MoI	Service developed	MoI MoH UNDP	Third quarter 2022	Third quarter 2023	€20,000	DEU donation
FIELD		**Application of eID and electronic trust services in order to further develop and mass use of e-services**					
Activity impacting Operational objective implementation		**Result Indicator**	**Competent institutions**	**Activity start date**	**Activity end date**	**Funds planned for activity**	**Financing source**

						implementation	
2.2.6	Establishing system for electronic identification and authentication NS eID (establishing Single Sign on places)[81]	NseID system established	MPADSM	First quarter 2022	Third quarter 2022	No funds needed	
2.2.7	Development of new services (service for submitting applications for ID cards, passport, driving license...) with the procedure of identification with certificates issued on ID card	Number of services established with the procedure of electronic identification	MoI	Second quarter 2022	Second quarter 2023	€15,000	DEU donation
2.2.8	Providing new ID card readers free of charge or at favourable prices	Number of free readers for citizens provided	MPADSM MoI UNDP	First quarter 2022	Fourth quarter 2023	€5,000	DEU donation

[81] As part of the establishment of the national digital ecosystem (NS eID, NS NAT, SEDES, eGovernment Portal, eInbox)

2.2.9	Establishing electronic services for inspection of personal data from registers, as well as checking by user which institution used their personal data	Service for inspection of personal data established	MoI	First quarter 2022	Fourth quarter 2023	€5,000	Donor funds

OPERATIONAL OBJECTIVE 2.3	**Improvement and development of the ICT sector**		
Indicator	**Baseline value**	**Target value by 2024**	
Number of active ICT companies	**970**	**1.115**	**1,230**
Number of employees in ICT companies	**4.441**	**4.885**	**5.500**

FIELD	**Availability of ICT equipment in order to overcome the digital divide**					
Activity impacting Operational objective implementation	**Result Indicator**	**Competent institutions**	**Activity start date**	**Activity end date**	**Funds planned for activity implementation**	**Financing source**

2.3.1	Providing discounts by the ICT companies in order to implement Subsidies for purchasing computer equipment by socially vulnerable categories and students	Number of ICT companies who provided discounts	ICT sector	First quarter 2021	Fourth quarter 2023	Budgets of companies	ICT companies donations
2.3.2	Subsidies for purchasing computer equipment and peripherals by socially vulnerable categories	Amount of subsidies granted for socially vulnerable categories	MPADSM	First quarter 2022	Fourth quarter 2023	€200,000	Budget of Montenegro
2.3.3	Subsidies for purchasing computer equipment and peripherals by pupils and students	Amount of subsidies granted for pupils and students	MPADSM	First quarter 2022	Fourth quarter 2023	€200,000	Budget of Montenegro
FIELD		**Mechanisms to support the growth and digitalisation of companies' operations and digital transformation of organisations (economy, NGOs, education)**					

Activity impacting Operational objective implementation		Result Indicator	Competent institutions	Activity start date	Activity end date	Funds planned for activity implementation	Financing source
2.3.4	Monitoring and analysis of tax policy implementation with recommendation to amend legal framework aiming to specifically recognise IT companies and IT staff	Number of initiatives /proposals put to Government of Montenegro	PKCG	First quarter 2022	Fourth quarter 2023	No funds needed	Budget of PKCG
2.3.5	Preparation of Analyses of necessary activities in order to fully implement eInvoice, with recognising and identifying obstacles for institutional implementation of the eInvoice	Analysis prepared	Ministry of Finance and Social Welfare, MPADSM, Business associations	First quarter 2022	Third quarter 2022	No funds needed	Budget of Montenegro

2.3.6	Amending legislation to enable implementation of eInvoice based on analysis	Legislation amended	Ministry of Finance and Social Welfare, MPADSM	Third quarter 2022	Fourth quarter 2023	No funds needed	Budget of Montenegro
2.3.7	Creating an environment to attract foreign investment funds to ICT sector	Amount of direct foreign investments in ICT	Investment Agency, Ministry of Finance and Social Welfare	First quarter 2022	Fourth quarter 2023	No funds needed	Budget of Montenegro
2.3.8	Implementation of legislation related to facilitations for digital nomads and attracting scarce ICT staff from abroad	Number of digital nomads	MoI	First quarter 2022	Second quarter 2022	No funds needed	Budget of Montenegro
2.3.9	Joint participation in ICT projects, through companies' partnerships with academia and scientific organisations	Number of ICT projects implemented, through companies' partnerships with academia and scientific organisations	Universities, Economy	First quarter 2022	Fourth quarter 2022	No funds needed	N/A

2.3.10	Grants for innovative projects to support cooperation between the scientific and research community and the economy	Number of projects of IT companies and S&R institutions supported	MED	First quarter 2022	Fourth quarter 2023	€600,000	500,000 IPA 2020, 100,000 Budget of Montenegro
FIELD		**Definition and implementation of a mechanism for the development of an innovative ICT ecosystem**					
Activity impacting Operational objective implementation		**Result Indicator**	**Competent institutions**	**Activity start date**	**Activity end date**	**Funds planned for activity implementation**	**Financing source**
2.3.11	Strengthening capacities of the Innovation Fund	Number of grants allocated by the Innovation Fund	MED, Innovation Fund of Montenegro	First quarter l 2022	Second quarter 2023	€350,000	Budget of Montenegro Donor funds
2.3.12	Establishing an Office of Technology Transfer	Pre-Feasibility Study prepared Office established	MED, Science and Technology Park of Montenegro	First quarter 2022	Third quarter 2023	€30,000	Donor funds

2.3.13	Support to innovative programmes and projects in the priority sector - ICT	Number of innovative programmes and projects supported	MED, Innovation Fund of Montenegro	First quarter 2022	Fourth quarter 2023	€1,000,000	Budget of Montenegro
2.3.14	Incentives for research and innovation in the ICT priority field in the area of new technologies in the economy	Number of granted incentive beneficiary statuses in the ICT priority field	MED	First quarter 2022	Fourth quarter 2023	n/a	The measure includes reductions, brakes or exemption in relation to the set of legally determined fiscal incentives
FIELD		**Exports, internationalisation of ICT companies and increasing the share of domestic ICT companies in international tenders**					
Activity impacting Operational objective implementation		**Result Indicator**	**Competent institutions**	**Activity start date**	**Activity end date**	**Funds planned for activity implementation**	**Financing source**
2.3.15	Incentives for companies exporting IT services and products	Number of loans granted	Investment and Development Fund of Montenegro (in cooperation with	First quarter 2022	Fourth quarter 2022	It is not possible to asses funds because it concerns granting loans on demand	Budget of Investment and Development Fund

			institutions competent for the field concerned)				
2.3.16	Subsidies for study visits abroad that aim to make new business in the international market	Number of subsidies through Program Line to Support Internationalisation within the Economy Competitiveness Improvement Programme	MED	First quarter 2023	Fourth quarter 2023	€200,000	Budget of Montenegro
2.3.17	Subsidies for organisation of ICT conferences, festivals, summits and fairs in Montenegro	Number of international and local events organised	MPADSM	First quarter 2022	Fourth quarter 2023	€200,000	Budget of Montenegro
2.3.18	Establishing instructions and recommendations in order to facilitate the participation of Montenegrin ICT companies in international tenders (possibility of additional plus for	Instruction published	Ministry of Finance, Labour and Social Welfare	Second quarter 2022	Third quarter 2022	No funds needed	

	consortia composed of local companies)						