DIGITAL SKILLS

Needs and Opportunities

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The document is prepared based on the research on digital skills supply and demand and related report, produced by E3 company.

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INTRODUCTION

This document presents the main findings of the *Research on the Current Offer and Needs of the Market in Relation to Digital Skills*, which is aimed at identifying the gaps, emerging needs and opportunities for action to improve both the supply and demand sides of digital skills, which would contribute to efficient development of a modern labour market which will be able to respond and maintain competitiveness on all fronts and in the face of all emerging trends.

Implemented by the company E3, the aim of the research was achieved through cooperation with a wide array of stakeholders from various levels of institutional, organizational and business authorities and competences. An integrated and inclusive approach to the overall project was taken with the aim not only of addressing and analysing digital and ICT skills from various perspectives, ranging from the systems of formal education to development of digital skills and their integration in the labour market, but also of determining an institutional and regulatory framework for future development and more efficient integration of digital skills in the Montenegrin labour market. Thus, this report provides not only an overview of the current level of digital skills of the workforce, but also a map of the potential areas for further action that can be taken at all levels, all of which are based on mutual cooperation of all the relevant stakeholders in all segments of society, thus including public institutions, the business sector, education providers, civil society and individual responsibilities in this process.

For the purpose of obtaining the highest level of detail and quality, several methodological approaches were implemented, including a **desk review** of the available data and information, a **quantitative survey among companies**, along with **in-depth interviews** and **focus groups** with several relevant and competent stakeholders. The analysis and results of the research are presented in this document, while the methodological approach is elaborated in Annex I.

MAIN FINDINGS AND RECOMMENDATIONS

DEMAND FOR DIGITAL SKILLS

The vast majority of the surveyed companies consider **that the level of digital skills of their employees' impacts the business performance of their companies**, recognizing that these skills positively influence their efficiency and productivity and that keeping up with the digital revolution is essential.

In more than half of the surveyed companies, there are currently no employees who do not have the digital skills necessary to perform regular business activities. Furthermore, in 21% of the companies there are a small number of employees (up to 30% of the total number of employees) who do not have the digital skills necessary to perform regular business activities. On the other hand, 8.5% of the companies reported that they have a large number of employees who lack the necessary digital skills.

Most large companies invest in the training of their employees, while a significant number of small companies also invest in the training of their employees. The companies which most invest in the training and development of their employees come from the sectors of **electricity supply, ICT, administrative and support service activities** and **education.**

The skills most needed for business processes in the companies are:[1] **communication via e-mail; searching, collecting and processing information by using ICT; use of Microsoft Word and Excel; marketing; and the use of programs/applications for e-business and communication through social networks**. Similarly, the skills identified which employees possess but which should be improved are: use of Microsoft Excel and Word, e-mail communication and marketing.

Employers' assessment of the level of digital skills of their employees shows that 83% of employees possess basic ICT skills, while only 32% possess specialized skills. In IT companies, the situation is, understandably, more in favour of specialized skills, which almost half of their employees have.

The majority of the surveyed companies consider that the greatest demand, when it comes to digital and creative skills, is for **social marketing managers, IT project managers, mobile app developers, professional photographers** and **front-end developers**. When it comes to employees' digital skills in a modern business environment, the companies consider that the following skills are essential: **managing business processes, design, management of change, data analysis** and **big data**.

The largest number of ICT companies consider that the highest demand for **IT specialists** is in the fields of: **information security, network infrastructure, mobile technologies, big data analysis, AI and IoT, cloud computing** and **business change management**. Companies outside the ICT sector but with designated ICT departments identify the lack of the following profiles: **developers,[2] data analysts, marketing, graphic designers, IT consultants, IT specialists and web designers/developers**. Apart from the abovementioned more general ICT occupations, employers have also expressed the need to hire **copywriters, UX/UI designers, quality assurance engineers, integrators (JR/SR), Java developers, .NET developers** and **AI specialists**.

1 In this order of importance.

2 In this order of importance.

The digital skills and occupations that Montenegro is currently missing, which have either been in demand for some time or which are going to be emerging in the following years, range from basic or core skills such as: **use of emails, the Microsoft Office package, digital marketing, IT project management, design, soft skills**, to more specialized skills such as: **programming, AI, machine learning, IoT, testing, quality assurance, cloud systems**, skills related to development of systems for **cryptocurrency trading**, including all aspects related to blockchain technologies, skills related to construction of **self-driving vehicles**, etc.

When it comes to those skills that are present but should be improved, the companies most reported **searching, collecting and processing information, use of Microsoft Excel and Word, communication via email and online meeting platforms, marketing, production of multimedia content, use of e-business applications and software**, and **use of software for data processing, design** and **ICT infrastructure maintenance**.

The occupations identified as currently being in **highest demand** are: **social marketing managers, IT project managers, mobile app developers, front-end developers, back-end developers, software architects, DevOps engineers, data analysts, GUI programmers** and **UX/UI designers**.

When it comes to the **emerging needs** in terms of ICT and digital skills, 23% of the companies are certain that their employees are going to have to develop new digital skills in order to match the emerging needs, such as: **digital and affiliate marketing, programming, cloud technologies and IoT, data processing and analysis, scrum, digital platforms and web development, video editing, graphic design, OTTs, Nagios**, and **Radius**. A significantly indicative aspect of the emerging needs lies in the fact that companies are still identifying **basic ICT skills and knowledge of the Microsoft Office package** as an emerging need of the market.

Under the influence of the COVID-19 pandemic, the need for the digital skills of employees increased, especially in the areas of **e-business, marketing**, and **data management**. Since the beginning of the pandemic, 16% of the companies started investing more in the **training of their employees** in this area. Additionally, the pandemic led to an **increase in investments in new technologies**, which was reported by 17% of the surveyed companies.

What has emerged as one of significant findings is that digital skills alone are not sufficient – they have to be combined with soft skills. Namely, **soft skills** are identified as being necessary and as going hand-in-hand with expert skills, and the education curricula at all levels, from primary to tertiary, should include: teamwork, critical thinking, assertive communication, conflict resolution, and creativity. As far as soft skills are concerned, respondents also identified a lack of **basic business skills** such as email and general business correspondence, preparation and delivery of presentations, business communication, etc. Young people also lack a knowledge of foreign languages, even though knowledge of **English language** represents a basic precondition for working at any company. **Practical experience** and hands-on learning are essential as well.

SUPPLY OF DIGITAL SKILLS

Half of the surveyed companies believe that the Montenegrin **education system** is producing a workforce with the required knowledge and digital skills in accordance with the market needs, while 49% believe that the educational system does not provide a workforce which has the scope and level of digital and creative skills which meet the needs of the market. The most mentioned reasons for the latter are programmes which are **not aligned with the market needs and fast-changing trends, a lack of practical experience of students** and a **general lack of experts in this area**.

In contrast to formal education, employers have shown more satisfaction with the degree to which the **non-formal system** of education manages to meet the needs of the market, whereby they primarily pointed out the fact

that it actively focuses on and responds to the current trends and needs.

When it comes to primary education, the interviewed stakeholders believe that textbooks for information technology are well designed but could be improved in terms of regularly updating the content. Also, related thematic units are studied within the subject *"Information technology and technical studies"*, which limits the space for digital skills-related topics to be studied during the teaching period. The topics of cybersecurity, personal data protection and management, cyberstalking and cyberbullying, and fake news are not sufficiently incorporated into education programmes in primary education.

When it comes to **secondary education**, besides a few exceptions of vocational schools, a certain **discontinuity** is evident when it comes to programmes that include digital skills, since computer science classes are attended for a maximum of two years in most schools at the IV-1 level of education, and only for one year in general secondary schools. Due to this discontinuity, students do not have the opportunity to acquire adequate knowledge that would recommend them for faculties in the field of technical sciences and digital skills in a broader sense.

One of key factors is related to the **teaching staff**, more precisely to their capacities to teach relevant digital skills, as well as a willingness to adapt to fast changes and engage in additional professional development in this area.

Most of the schools lack the **infrastructural capacities** which could support all the programmes that are studied within the curricula.

When it comes to **tertiary education**, faculties at all four Montenegrin universities provide one or more study programmes related to these topics. Some of the issues at this level of education are related to the **slow pace of change and adaptation to the market needs and latest trends**, which is fundamentally inconsistent with the development of digital technologies that are advancing at an exponential rate.

It also happens that students learn from outdated books and materials.
At private universities, there is a good practice of establishing **multidisciplinary programmes** that combine programming, economics, analytics and data.

Employers emphasized that the workforce which comes to their companies does not have all the necessary capacities to quickly adapt to the process, but they need, on average, an additional six months in order to start **working independently**. Another challenge is related to the fact that the salaries in the domestic market are not competitive when compared to the salaries offered by international companies or the salaries provided by start-up companies.

Private companies deem that young people, as a result of social pressure, would still rather search for a **safe position in the public sector**, than choose to work in a private company.

Boosting the **digital literacy of civil servants** was also mentioned, including development of a digital skills framework reflecting job-specific digital competences.

MAIN CONCLUSIONS AND RECOMMENDATIONS

Montenegro has an overall strategic framework conducive to digital transformation, innovation, development of digital skills and the digitalization of education. Still, there are certain gaps when it comes to the development of the capacities and skills needed to respond to the labour market needs and to seize the existing opportunities for digitally advanced citizens and workforce.

A lack of adequate training and a **mismatch between the education system and the needs of the labour market** represent the main obstacles to finding a digitally skilled workforce that would be able to meet the needs of the labour market and all business sectors in general.

Education (at all levels) should be **adapted to the needs of the fast-paced** digital transformation process and fast-developing labour market. Further capacity building of the **teaching staf**f, improvement of the **infrastructure** needed for teaching and **up-to-date teaching materials** are important elements to be improved at all levels of education. Also, students need to be provided with **opportunities for practical work experience** as early as possible. Starting from gaps at the

elementary level of education, it is necessary to ensure more classes and opportunities for learning digital skills, including how to safely navigate the online world. When it comes to **secondary education**, it is important to ensure **continuity of the programmes** for development of digital skills, to improve teaching staff capacities, as well the related **infrastructure and resources** needed for the quality organization of classes. General gaps in the system of **tertiary education** are related to a **lack of agility** when it comes to quick adaptations to the fast-changing digital environment, the **complicated and slow** administration process related to changing academic **programmes and a lack of integration of soft skills** into curricula related to digital and ICT skills.

Since there is still a large proportion of employees facing difficulties with the simplest digital skills, such as e-mail communication, one of the primary goals should be **investment in the overall development of basic digital skills**, in both the private and public sectors. Besides their current deficiency, they are also identified as being essential in the future, as a prerequisite for the overall improvement of more specialized skills and knowledge in the market.

Another course of action would entail **accessible, basic and advanced, education and training in digital skills for all groups of citizens**.

Particular attention should be paid to **leaving no one behind** and developing digital skills of groups that may not have had access to such training, including: women, the unemployed, people living in rural areas, people with disability, refugees, and the elderly, in order to avoid exclusion and a digital divide in the new era of the digital economy.

It is very important to build the capacities of women when it comes to digital skills, as well as to encourage them to engage in technical professions through education at STEM faculties and similar initiatives.

It would be important to transition from **project-based training** to more **systematic matching of training schemes with specific job offers** or **identified market needs**.

Basic business skills, such as email and general business correspondence, preparation and delivery of presentations and business communication should be built up since they go hand-in-hand with any technical skills.

Soft skills are identified as being even more inextricably linked to digital skills, and educational curricula at all levels, from primary to tertiary, should include teamwork, critical thinking, assertive communication, conflict resolution, creativity, etc. Young people also must improve their knowledge of foreign languages, especially **English**, while **practical experience** and hands-on learning are also essential.

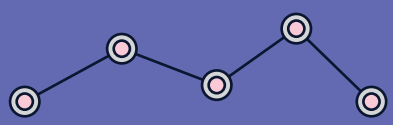
Changing the mindset and **culture of stable and safe jobs** in the public sector has to be addressed as well.

Continuous training of **public servants**, including at the management level, is also of the utmost importance. Besides digital literacy of all public servants, special attention should be paid to the capacities of the staff using digital systems.

Raising awareness about the scope, importance and relevance of digital skills and digital transformation for employment, the economy, inclusion and overall development is of utmost importance. The overarching issue that should also be addressed is observed **resistance to change and innovation**, which may be hindering progress in these areas.

All the activities aimed at the development of digital skills and the overall awareness about their importance and value will rely on **intersectoral cooperation**, with special emphasis on cooperation between educational institutions, national institutions and the business sector.

Finally, the development of digital skills cannot happen in a vacuum or in silos. Digital skills have to be observed and developed through creating wider links to soft skills, innovation, entrepreneurship, use of e-services, development of digital infrastructure, transparency and human rights.



DIGITAL SKILLS – CONCEPTS AND FRAMEWORKS

The Human Development Report 2020[3] identifies ***digitalization***, i.e. *digital transformation*, as one of the main drivers of the Montenegrin economy in the upcoming decades, whereby the following six main actions are identified as crucial 'to make a digital Montenegro a reality': *mastering digital skills; expanding the digital infrastructure; strengthening the business, start-up and ICT ecosystem; incentivizing innovation for digital transformation; transitioning to public administration e-services; and establishing a coordination body for the development of digital solutions*. Digital transformation is identified as one the strategic priorities and drivers of innovation, modernization, competitiveness and overall socio-economic development by the Government of Montenegro.[4] This trend related to the development of a digital economy has been present at the global and EU levels, as has the role of digital skills in economic development throughout the 21st century.

The European Commission's *"Key Competences for Lifelong Learning"*[5] defines **digital competence** as one of the eight crucial *"competences essential to citizens for personal fulfilment, a healthy and sustainable lifestyle, employability, active citizenship and social inclusion"*, which represents the overarching framework for this project. Digital competence is part of the revised European Reference Framework of Key Competences for Lifelong Learning, competences which all citizens should have. The European Digital Competence Framework for Citizens describes digital competences in the following five areas: information and data literacy; communication and cooperation; digital content creation; safety and well-being; and problem solving.

The term 'e-skills'[6] was adopted and used by the European Commission after it was introduced by the European e-Skills Forum in 2004, whereby this concept was used in response to growing demand for highly skilled ICT practitioners and users. In this context, the following distinction was made between e-skills:

- **ICT user skills**, required for effective use of ICT systems and devices: "*ICT users apply systems as tools in support of their own work, which is, in most cases, not ICT*";
- **ICT practitioner skills**, required for researching, managing, developing and designing, consulting, marketing and selling, integrating, installing and administering, maintaining and servicing ICT systems;
- **E-business skills (or e-leadership skills)**, needed to exploit the opportunities provided by ICT, producing more efficient and effective performance of different types of organizations, exploring the possibilities for new ways of conducting business and organizational processes, establishing new enterprises.

Regarding this, *ICT for Work* stresses the importance of digital skills and related concepts, such as digital competence, as "*key terms in the discussion on the kind of skills needed by citizens – in Europe and beyond – to participate and thrive in our society, not only in terms of citizens'* ***social and digital inclusion****, but also in terms of* ***employability*** *and* ***economic growth***".[7]

3 Human Development Report: On the Verge of a Digital Future, UNDP, 2020. https://hdr.undp.org/content/national-human-development-report-2020-montenegro

4 Work Programme of the Government of Montenegro for 2021, p. 6.

5 European Commission, Directorate-General for Education, Youth, Sport and Culture, Key competences for lifelong learning, Publications Office, 2019, https://data.europa.eu/doi/10.2766/569540

6 ICT for Work: Digital Skills in the Workplace, European Commission, 2016, p. 19.

7 Ibid.

Finally, this distinction between digital skills which has been adopted at the EU level includes: ***basic digital literacy skills; digital skills which relate to employment;*** and digital skills for ICT professions. When it comes to the related indicators, which have been defined by the European Commission in terms of Europe's digital performance, they are defined in the form of the Digital Economy and Society Index (DESI), which includes five dimensions: *connectivity, human capital, use of the internet, integration of digital technology and digital public services*.[8]

Overall, the analysis is based on the two primary digital competence frameworks established by the European Commission's ***EU DIGCOMP 2.0*** and ***The European Digital Competence Framework for Citizens***. The UN "*Global Framework of Reference on Digital Literacy Skills*" uses the EU DIGCOMP framework for monitoring, assessment and further development of digital literacy, thus this project was based on this framework as the most relevant and reliable 'tool' for benchmarked assessment and improvement of digital skills.

The OECD has defined ***digital skills*** as a key competence across OECD countries and the concept of ***digital competence*** is defined by the ***EU DIGCOMP 2.0 framework*** as a set of five key areas of competence,[9] which were used for assessment of skills throughout the analysis:

Information and data literacy: identify, locate, retrieve, store, organize and analyse digital information, judging its relevance and purpose;

- **1.1.** Browsing, searching and filtering data, information and digital content
- **1.2.** Evaluating data, information and digital content
- **1.3.** Managing data, information and digital content

Communication and collaboration: communicate in digital environments, share resources through online tools, link with others and collaborate through digital tools, interact with and participate in communities and networks, cross-cultural awareness;

- **2.1.** Interacting through digital technologies
- **2.2.** Sharing through digital technologies
- **2.3.** Engaging in citizenship through digital technologies
- **2.4.** Collaborating through digital technologies
- **2.5.** Netiquette
- **2.6.** Managing digital identity

Digital content creation: create and edit new content (from word processing to images and video); integrate and re-elaborate previous knowledge and content; produce creative expressions, media output and programming; deal with and apply intellectual property rights and licences;

- **3.1.** Developing digital content
- **3.2.** Integrating and re-elaborating digital content
- **3.3.** Copyright and licences
- **3.4.** Programming

Safety: personal protection, data protection, digital identity protection, security measures, safe and sustainable use;

- **4.1.** Protecting devices
- **4.2.** Protecting personal data and privacy
- **4.3.** Protecting health and wellbeing
- **4.4.** Protecting the environment

Problem solving: identify digital needs and resources, make informed decisions on the most appropriate tools according to the purpose or need, solve conceptual problems by digital means, creatively use technologies, solve technical problems, update one's own and others' competences.

- **5.1.** Solving technical problems
- **5.2.** Identifying needs and technological responses
- **5.3.** Creatively using digital technologies
- **5.4.** Identifying digital competence gaps.

8 Employment and Skills Aspects of the Digital Single Market Strategy, *European Parliament*, 2016, p. 15.

9 Skills for a Digital World, OECD, 2016, p. 27.

When it comes to the **role of digital competences in the labour market, polarization of the labour market** is defined in *ICT for Work: Digital Skills in the Workplace*[10] as a result of the digitalization of the economy, whereby this concept is "*leading towards higher demand for a highly skilled workforce, equipped with cognitive skills and technical skills to deal with the tasks and procedures required by new technologies, while, on the other hand, it has led to a decrease in demand for a medium-skilled and (although to a lesser extent) low-skilled or non-skilled workforce*".[11] On another note, the World Economic Forum has defined digital skills as being essential for the active and effective participation of the workforce in "*the fourth industrial revolution*", something that has significantly contributed to demand for ICT and a digitally skilled workforce in the COVID-19 economic context, which has led both employers and employees towards developing and implementing skills which can ensure a quick shift towards meeting the needs of fast-paced economic and market trends.[12] Moreover, the impact and significance of digitalization for specific sectors in the context of COVID-19 was identified by UN Montenegro, whereby they emphasize the role and significance of use of digital tools in the Montenegrin health system which emerged during the pandemic. Use of digital solutions has proven to be essential during the pandemic with "*focus shifting to new models of care, supported by digital technologies*",[13] although it is stated that there are still ongoing barriers to adopting digital tools.

Considering the abovementioned, digital and ICT skills have been defined as essential skills for the efficient and effective development of a modern and sustainable economy at the European and global levels. As identified in the **European Commission Report for 2021**, Montenegro's education system is facing numerous challenges. One of them is a skills mismatch for VET and higher education. Montenegro needs to be more focused on increasing investment in green and digital transition. The report stipulates that Montenegro has been achieving expected improvements in regard to requirements stipulated by *Chapter 10: Information Society and Media*, but that it should continue developing in this regard, along with complying with the provisions defined in the context of *Social Policy and Employment (Chapter 19), Science and Research (Chapter 25)* and *Education and Culture (Chapter 26)*.

THE INSTITUTIONAL, LEGISLATIVE AND STRATEGIC FRAMEWORK FOR A DIGITAL MONTENEGRO

The key institutions in charge of development and implementation of policies in the area of digitalization and digital skills are as follows:

1. **The Ministry of Public Administration** is responsible for creating a comprehensive normative framework that will ensure digitalization to full capacity, both within the public administration and in the procedures that citizens and businesses engage in with the public administration. The key laws that regulate this area are: the Law on Electronic Administration, the Law on Electronic Identification and Electronic Signatures, the Law on Information Security and the Law on Electronic Documents. Additionally, as a work framework, the ministry is guided by the Digital Transformation Strategy for the development of a digital Montenegro.

   The provision of services to citizens is one of the basic activities in public administration, and the processes of digitalization of services should enable efficient, transparent and high-quality provision of services. To that end, a unique counter for carrying out all public administration e-services was identified – the e-government portal www.euprava.me.

2. **The Ministry of Economic Development and Tourism** is responsible for the process of creating and implementing policies and programmes for the development of entrepreneurship and small and medium-sized enterprises. Policies for the development of micro, small and medium-sized enterprises, the development of women and lifelong entrepreneurship are followed through the realization and implementation of the defined measures and activities through the following three strategic documents:

   - The Strategy for the Development of Micro, Small and Medium-Sized Enterprises 2018–2022;
   - The Strategy for the Development of Female Entrepreneurship 2021–2024

10 ICT for Work: Digital Skills in the Workplace, European Commission, 2016.

11 ICT for Work: Digital Skills in the Workplace, European Commission, 2016, p. 4.

12 The Future of Jobs Report, World Economic Forum, 2020, p. 8.

13 The UN Socio-Economic Response Plan to COVID-19, UN in Montenegro, 2020, p. 18.

- The Strategy for the Development of Lifelong Entrepreneurial Learning 2020–2024.

  In the coming period, the Ministry of Economic Development plans to prepare the Programme for Improving the Competitiveness of the Economy. A set of financial and non-financial incentive measures will aim to encourage investments, the development of industry and processing and production capacities, encouragement of exports, digitalization and innovation in the introduction of international standards, which will contribute to strengthening their competitiveness in the domestic and foreign markets.

  In addition to the above, the ministry is in charge of supervising Tehnopolis, a separate company that provides a series of infrastructure and support measures that enable the opening up of new companies and the development of business based on new, innovative ideas and technologies. The mission of IPC Tehnopolis is to support the improvement of the national innovation and entrepreneurship system in Montenegro through a set of activities, the implementation of which will develop and improve innovation capacities and the innovation infrastructure for the needs of the overall sustainable economic development of Montenegro.

3. **The Ministry of Science and Technological Development** carries out administrative tasks related, among other things, to the connection of scientific institutions with economic entities, the application of scientific knowledge, technical and technological knowledge, inventiveness and innovativeness, in the function of creating and realizing new and improved products, processes and services; science and technology parks, innovation-entrepreneurial centres and other subjects of innovation infrastructure; stimulating innovation in entrepreneurship; support services for start-ups and other entities that perform innovation activities; implementation of incentive measures for the development of innovations in cooperation with other competent institutions; preparation of draft laws, other regulations and general acts in the field of innovation.

   In the light of the topic that is the subject of this report, it is particularly important to mention the *Science and Technology Park of Montenegro*, which was established with the aim of providing support and strengthening the potential of economic growth and development of Montenegro, through the establishment and growth of companies/teams in high-tech activities. STP Montenegro was founded in partnership with the Government of Montenegro, the Ministry of Science and the University of Montenegro. This institution plans to provide support for entrepreneurial ventures through the processes of incubation, financing, training, mentoring and connecting with technological innovation ecosystems, both regional and global.

4. **The Ministry of Education** is in charge of activities related to: the operation and licensing of education institutions; conditions related to the establishment and organization of the operation of educational-pedagogical institutions; recognition of foreign certificates for completed primary, secondary and high education; adoption and approval of educational programmes for preschool education and pedagogical development, primary education and pedagogical development, general secondary education, vocational education, education and development of children with special needs and adult education; enrolment policy for public higher education institutions; adoptions of norms related to the profile and education of teaching staff, expert associates and teaching associates, in both elementary and secondary schools.

5. **The Employment Agency of Montenegro** implements several programmes, the most important of which is the Active Employment Policy Programme. Active employment policy programmes are implemented in cooperation with education organizers and employers. The programmes are intended for conditionally employable persons from the register of unemployed persons. These are persons whose employment is conditional due to certain circumstances in the labour market. The goal is to increase employability and contribute to the employment of these persons.

   Some of the services offered by the EAM are services for jobseekers, services for employers and seasonal jobs. The main laws, strategies and plans that guide work of this institution are:

   The Law on Employment Mediation and Entitlements during Unemployment (“Official Gazette of Montenegro”, No. 24/19)

   - The National Employment Strategy 2021–2025
   - The National Employment Action Plan for 2022

6. **The Human Resources Administration** manages human resources at the national level, while its work is overseen by the Ministry of Public Administration. The HRA: implements programmes and plans for professional training and specialization, as well as other types of professional support in the area of education and development of human resources for the needs of the internal labour market and identification of possibilities for their adequate professional engagement; realizes analysis and surveys in the area of human resource management and planning; and organizes and implements programmes for professional training and education of civil servants and employees.

Besides the institutional stakeholders which are in charge of the creation and implementation of policies, there are other important stakeholders in this area, such as: providers of formal education, providers of non-formal education, private companies and associations which promote digitalization and digital skills, as well as international organizations which support institutional capacities and evidence-based policy making in this area.

The legislative framework in Montenegro provides an enabling environment for the development, implementation and provision of digital products and services, by stakeholders from both the private and public sectors. The relevant laws regulate the aspect of access to the relevant infrastructure, products and services, while they regulate the matter of responsibility and competences in this area, all with the aim of providing all citizens with fair and equal opportunities and access to such products and services.

The Law on Electronic Identification and Electronic Signatures represents one of the cornerstones of Montenegrin digitalization, development and the implementation of digital skills due to the fact that it ensures efficiency in the operation of the public and private sectors, all while ensuring a transparent, safe and enabling environment for the citizens. Additionally, the ***Law on Electronic Documents***, which ensures the officiality and security of electronic documents in both the private and public sectors, represents the second essential step towards a digital Montenegro tailored to the needs of its citizens. Finally, digitally based services are highly reliant on provisions of the ***Law on Information Security***, which ensures the overall compliance of all digitally offered services in terms of security, and this law represents the basis for the digital economy in Montenegro, since it guarantees full and equal rights to all its citizens in terms of security in the digital era.

Moreover, the Montenegrin legislative framework is tailored to meet the needs of national and international market and economic trends in the sense that it supports and incentivizes innovative activities and research. The ***Law on Innovative Activities*** incentivizes all the relevant stakeholders from the private sector and society as a whole to develop innovative products and services. Additionally, the *Law on Incentives for Research and Innovation Development* is also developed with the purpose of incentivizing research and innovation in all areas of expertise, and so this law is also aimed at promoting cooperation between different types of stakeholders, e.g. the private sector, NGOs and educational institutions.

The ***General Law on Education and Upbringing, the Law on Higher Education, the Law on Vocational Education and the Law on Youth*** represent the essential building blocks of the development of young people in Montenegro and they are currently tailored to meet the needs of the overall system, whereby they define the priority areas for specialization, cooperation between educational institutions and the relevant stakeholders, opportunities for professional development and social inclusion of young people. Taking into account the fact that the digital era is changing societies as a whole through rapid changes in economic trend and needs (which are reflected in the labour market), these laws are to be tailored not only to the needs of the education system, but to the needs of the labour market itself, which is to be achieved through adoption of provisions which will ensure more flexibility in terms of education programmes at all levels.

When it comes to strategic documents at the state level, Montenegro's vision regarding digital skills and technologies is primarily defined in the ***S3 Smart Specialization Strategy of Montenegro 2019–2024***, which defines its **2024 Vision** as a "*digital Montenegro with the use of advanced ICT solutions in all sectors of the economy and a developed IT awareness that enables dynamic and proactive access to new and innovative technologies*". S3 has become a key link bringing together several sector-level policies, which will serve as the basis for further national investments. Information and communication technologies are deemed to be the key technologies that should lead to an increase in competitiveness of the priority sectors: agriculture, energy, tourism and ICT.

Regarding its ICT priority, the S3 Smart Specialization Strategy defines two main aims:

- Improving the competitiveness of the ICT sector through innovative activities and
- Strengthening the digital economy.

Within the digital transformation programme, the objective is to reorganize and improve business processes in the priority areas of smart specialization and public administration through digital technologies. Digital transformation should enable the achievement of the most modern technological standards, the development of e-infrastructure and the application of innovative ICT solutions at the state level.

Montenegrin strategic goals are related to **improvement and transformation of the public sector**, which is to be achieved through the strategic goals defined in the ***Strategy for Public Administration Reform 2022–2026***. The main strategic goals which are to be achieved regarding this are *Use of quality services by the citizens and businesses and Professional public administration.* Regarding digital skills and digitalization, the strategic goals which are to be achieved in public administration, so as to ensure the high quality of services and better conditions in the labour market, are:

OG 1.2
Paperless administration

OG 3.2
Public administration – an attractive employer through adoption of the Digital Academy and development of ILIAS platform for online education.

Montenegro is committed to implementation of the ***Cyber Security Strategy 2022–2026*** which identifies significant gaps in terms of awareness of the citizens and senior management regarding cyber-security – thus posing a significant risk to the safe use of digital services. These issues are to be addressed through realization of the following strategic goals (SGs): *SG 1 – Improved capacities for cyber-defence and crisis situation management caused by cyber-attacks/incidents of higher significance; SG 2 – An improved system of protection of critical information infrastructure; SG 3 – Strengthening responses to cyber-crime and a harmonized system of data protection; SG 4 – Improvement of the education system in area of cyber-security in the public and private sectors*. The essential operative goals which represent an opportunity and call for action for a wide array of national and international stakeholders from the public and private sectors include:

OG 1.1
Strengthening the impacts on the highest level of management, with the aim of ensuring optimal financial, organisational and human resources for development of cyber capacities.

OG 1.6
Establishing a base of talents and volunteers who are engaged in cyber-security.

OG 2.3
Improvement of the education process for employees of the Ministry of Internal Affairs, the Police Administration and the judiciary

OG 4.1
Implementation of an education programme and education about cyber-security and safe use of ICT at all levels of education

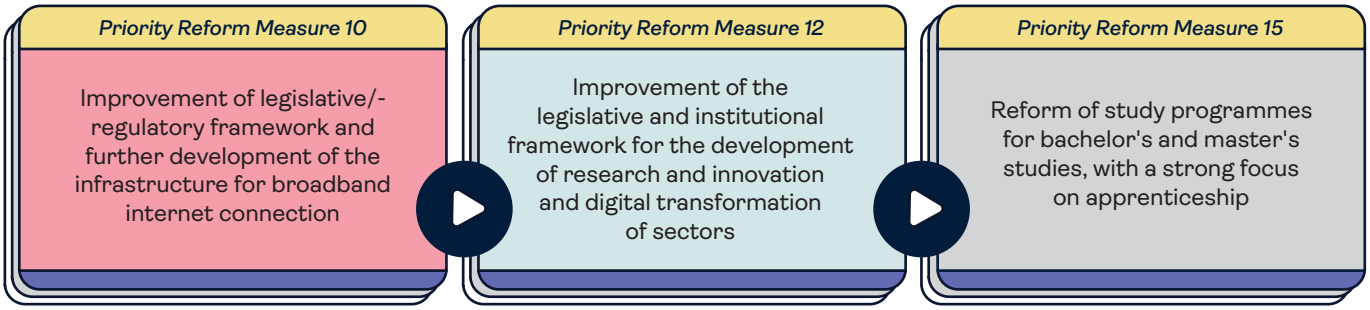
OG 4.2
Centralization and promotion of educational material and information about the available programmes and training

OG 4.3
Adoption of the main guidelines for obtaining and improvement of cyber-skills in the public and private sectors

OG 4.4
Realization of a programme of education for employees in the public and private sectors about cyber-security

The Economic Reform Programme 2021–2023, as one of the leading frameworks for the further development of Montenegro, points out the importance of digitalization in the area of creating an integrated digital market in the upcoming years. It identifies the following development sectors: energy and traffic; agriculture, industry and services; business sector and reduction of the informal economy; research, development, innovation and digital transformation; reforms related to economic integration; education and skills; employment and the

labour market; social protection and inclusion, including health protection. In this regard, some of the principal priority measures defined in accordance with the European and global trends are related to:



Education represents the cornerstone of development of digital skills. Thus, the ***Strategy for Digitalization of the Education System of Montenegro 2022–2027*** promotes the importance of digital skills through three principal strategic goals referring to the education information system, improvement of the digital ecosystem and improvement of the digital skills of teachers and students.

Montenegro's strategic framework highlights the importance of vocational education in the service of digitalization. The ***Strategy for Development of Vocational Education 2020–2024*** defines that *the teaching process shall be improved through use of digital technologies so that students may acquire digital competences* and that *teachers shall be provided with opportunities for improvement of digital competences and motivated to use digital technologies in the classroom*. All the interested stakeholders have the opportunity to implement measures related to the professional and vocational development of teachers, so as to provide them with more opportunities for development and successful integration of digital skills in the classroom.

The ***Adult Education Strategy 2015–2025*** defines five strategic goals related to key directions of development of the national system of adult education:

SG 1 *Improvement of the education information system*

OG 1.1.
Improvement of the legal framework

OG 1.2.
Improvement of the hardware infrastructure

OG 1.3.
Development and improvement of software components

OG 1.4.
Improvement of the processing, use, accuracy and reliability of data

OG 1.5.
Establishment of interoperability and development of electronic services

OG 1.6.
Improvement of the staff structure

SG 2 *Development and improvement of the digital ecosystem*

OG 2.1.
Establishment of a system for planning and development

OG 2.2.
Improvement of the legal framework

OG 2.3.
Improvement of the computer infrastructure in educational institutions

OG 2.4.
Development of digital education content

OG 2.5.
Establishment of a platform for independent learning

OG 2.6.
Improvement of online collaboration in all education institutions

SG 3 *Development and improvement of digital skills and competences*

OG 3.1.
Increasing the level of digital skills and competences of employees in educational institutions

OG 3.2.
Raising the level of the digital skills and competences of students

OG 3.3.
Improving the safe use of technology

OG 3.4.
Improving digital skills and competences as well as implementation of digital technologies through promotional campaigns

- An increase in the social inclusion of adult citizens through lifelong learning and educational activities;
- Improvement of the knowledge, skills and competences of adults for employment, labour market mobility and competitiveness;
- An increase in the competences of employees in order to achieve faster economic growth;
- Establishment of a quality assurance system in adult education;
- Provision of a flexible and sustainable adult education system.

The most recent strategic act – the ***Digital Transformation Strategy 2022–2026*** – defines specific strategic and operative goals for the digital transformation of Montenegro, which will be essential for the upcoming transformation of Montenegro's labour force and labour market. The essential strategic goals which will be achieved through the upcoming period are: **Improvement of the capacities and capabilities for the digital transformation of Montenegro and Strengthening the digital awareness of Montenegrin society and digital competitiveness of the ICT sector.** When it comes to the first goal, this includes the operational goal: *Development and improvement of the digital knowledge and skills of Montenegrin society*, which defines digital skills as a must at all levels of education. In order to increase the level of digital skills, the strategy defines activities in the area of formal education, lifelong learning for all groups of citizens and a series of activities related to raising the skills of employees in the public and private sectors. It envisages an increase in the percentage of employed female IT experts, as well as the strengthening of the level of knowledge and skills in the fields of STEM and digital transformation. In the public sector, it plans for an upgrade of the skills of public servants who provide digital services and implement digital transformation.

The ***National Employment Strategy of Montenegro 2021–2025*** also includes digital skills, through the following operational goals and measures:

OG 2: Creation of knowledge and competences for the labour market in the digital era.

Measure 2.1: Provision of IT education and training for a digital economy for all.

Measure 2.2: Improvement of the quality of vocational and higher education through an improvement of practical education with the aim of increasing the employment rate.

Montenegro is encouraging entrepreneurship and employment programmes for its citizens, as some of the main drivers of economic development through the ***Programme of Incentives for Innovative Start-Ups in Montenegro*** and the ***Programme for Improving the Competitiveness of the Montenegrin Economy***. These programmes stress the importance of encouraging entrepreneurship education at universities and of encouraging the development of existing business processes, products and services in order to strengthen the competitiveness of SMEs. The importance of these programmes in the era of digitalization of products and services lies in the fact that they promote the need for development of not only hard, but also **soft digital and creative skills**, which have been identified as essential for full integration into the digital and modern economy.

Digital skills have been identified as one of the guiding aspects of development of entrepreneurship and lifelong learning, thus Montenegro is dedicated to implementation and promotion of entrepreneurship through the formal education system, while the *Strategy for Lifelong Learning 2020–2024* identifies the following main strategic goals and calls for action:

Strategic Goal 1: *Improve development of entrepreneurial competences at all levels of formal education*	***Strategic Goal 2:*** *Improve the realization of entrepreneurial learning with non-formal education*	***Strategic Goal 3:*** *Increase the efficiency of operation of the system of entrepreneurial learning*
Measure 1.1.4. Create conditions for development of digital competences and improvement of financial literacy as an integral segment of entrepreneurial competences	**Measure 2.2.3.** Develop and implement programmes for stimulating entrepreneurship in key sectors (IT, green economy, digital economy, creative industries)	**Measure 3.2.5.1.** Organize a media campaign about the significance of entrepreneurial learning and the benefits of entrepreneurial learning for both individuals and the country (including digital skills and financial literacy)

RELEVANT INTERNATIONAL POLICIES AND TRENDS

There are several documents covering digital skills topics at the international level.

EU policy in this area is defined by the **European Skills Agenda**, a five-year plan to help individuals and businesses develop more and better skills and to put them to use.

The European Skills Agenda includes 12 actions organized around four building blocks:

A call to join forces in a collective action:

Action 1: A Pact for Skills

Actions to ensure that people have the right skills for jobs:

Action 2: Strengthening skills intelligence
Action 3: EU support for strategic national upskilling action
Action 4: Proposal for a Council recommendation on vocational education and training (VET)
Action 5: Rolling out the European Universities Initiative and upskilling scientists
Action 6: Skills to support the twin transitions
Action 7: Increasing STEM graduates and fostering entrepreneurial and transversal skills
Action 8: Skills for life

Tools and initiatives to support people in their lifelong learning pathways:

Action 9: Initiative on individual learning accounts
Action 10: A European approach to micro-credentials
Action 11: New Europass platform

A framework to unlock investments in skills:

Action 12: Improving the enabling framework to unlock member states' and private investments in skills

Besides this, the European Skills Agenda sets the following objectives to be achieved by 2025:

Indicators	Objectives for 2025	Current level (latest year available)	Percentage increase
Participation of adults aged 25–64 in learning during the last 12-month period (in %)	50	38 (2016)	+32
Participation of low-qualified adults aged 25–64 in learning during the last 12-month period (in %)	30	18 (2016)+	67
Share of unemployed adults aged 25–64 with a recent learning experience (in %)	20	11 (2019)	+82
Participation of adults aged 25–64 in learning during the last 12-month period (in %)	70	56 (2019)+	25

The **2030 Digital Compass**[14] is a set of guidelines and objectives established by the European Commission to guide the digital transformation of the European Union. One of the key areas of focus is the labour market, which is undergoing significant changes as a result of technological advancements and digitalization.

The 2030 Digital Compass identifies that the labour market will be transformed by digital technologies, and that it is important to prepare workers for these changes. The Compass sets out a number of objectives that are aimed at ensuring that workers are equipped with the skills and knowledge they need to thrive in the digital age.

One of the key objectives is to ensure that all EU citizens have basic digital skills by 2030. This means that everyone should be able to use digital tools and technologies effectively, regardless of their age or background. This will be achieved through a range of initiatives, including

14 https://futurium.ec.europa.eu/en/digital-compass, https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

digital skills training and education programmes.

Another objective is to support the development of new digital skills and competences that are in high demand in the labour market. This includes skills related to emerging technologies such as artificial intelligence, robotics and the Internet of Things. The Compass aims to ensure that workers have access to training and education programmes that enable them to acquire these skills.

The 2030 Digital Compass also identifies the need to address the digital skills gap that currently exists in the EU. This gap is particularly acute in certain sectors, such as healthcare and manufacturing, where the adoption of digital technologies has been slower. The Compass sets out a number of measures to address this gap, including the establishment of digital innovation hubs and the promotion of digital upskilling programmes.

Having in mind that Montenegro is recognized as an EU membership candidate, all the highlights and recommendations from the 2030 Digital Compass should be included in Montenegro's strategy documents, such as the Digital Transformation Strategy, Cyber Security Strategy, etc. This also should be a reason for fostering national skill strategies, reinventing the role of the Employment Agency of Montenegro and enabling legal migration due to employment (digital nomads).

The document **Digital Transformation in the Age of COVID-19**[15] was published in June 2020. The OECD Digital Economy Outlook 2020 (OECD, 2020) highlights the growing importance of digital technologies and communications infrastructures in our daily lives, and reveals that governments are increasingly putting digital strategies at the centre of their policy agendas. As countries work to respond to and recover from the COVID-19 crisis, now is the moment to ensure an inclusive digital transformation, with coordinated and comprehensive strategies that build resilience and bridge digital divides for the post-COVID era.

The central point of this report is the OECD Going Digital Integrated Policy Framework, which is oriented around seven building blocks: **access, use, innovation, trust, jobs, society and market openness**. The framework brings together the policies that governments must consider in order to shape a common digital future that improves lives and boosts economic growth and wellbeing.

The **UN Roadmap for Digital Transformation**[16] was published in June 2020. The Secretary-General's Roadmap responds to the recommendations of the High-Level Panel on Digital Cooperation on key issues, such as **universal connectivity, digital inclusion, human rights, artificial intelligence, and trust and security.**

The **Western Balkan Investment Framework**[17] provides financing and technical assistance to strategic investments in the energy, environment, social, transport and digital infrastructure sectors. It also supports private-sector development initiatives.

In addition to the mentioned regional initiative, one of the key points of the **Digital Agenda for the Western Balkans**[18] is developing the digital economy and society: e-government, e-procurement, e-health, digital skills and entrepreneurship. This document states that digital skills are necessary for the development of the digital economy and society in the Western Balkans, and that Western Balkan countries are suffering from a growing professional ICT skills shortage and a digital literacy deficit. This excludes many citizens from the digital society and holds back productivity growth.

EXISTING DATA

The Digital Innovation Profile – Montenegro[19] shows that Montenegro's overall Global Innovation ranking was 52nd out of 125 in 2018, which places Montenegro in the group of innovation achievers. However, the essential problem lies in the fact that innovation is mostly coming from small companies (with fewer than 20 employees), which is indicative of a lack of incentives among large companies to utilize and provide all the benefits granted by the digitally enabling environment. This report suggests that this gap will be bridged through *implementation of ICT and digital skills-based education programmes at earlier stages of the education process, which shall be intertwined with changes in academic curricula in the area of specialized, industry-relevant skills.*

15 OECD (2020), Digital Transformation in the Age of COVID-19: Building Resilience and Bridging Divides, Digital Economy Outlook 2020 Supplement, OECD, Paris. www.oecd.org/digital/digital-economy-outlook-covid.pdf

16 UN SG's Roadmap for Digital Transformation. www.un.org/en/content/digital-cooperation-roadmap/

17 www.wbif.eu

18 www.ec.europa.eu/commission/presscorner/detail/es/IP_18_4242

19 www.itu.int/dms_pub/itu-d/opb/inno/D-INNO-PROFILE.MONTENEGRO-2020-PDF-E.pdf

Baseline data available in regard to the availability of a digitally enabling environment and employment in Montenegro is provided by the Official Statistics Office of Montenegro (MONSTAT) and the Employment Agency of Montenegro. MONSTAT carries out an annual survey "ICT Usage in Enterprises in Montenegro", and the data for 2021 shows that 99.4% of the interviewed companies use computers for the operation of their business, while 100% of them have access to the internet. This survey also showed that 84.6% of the interviewed companies reported that they have an online presence, all of which is indicative of the willingness of Montenegrin companies to participate in the digital world of business.

When it comes to the baseline in terms of employment, MONSTAT reported an unemployment rate of 16.6% in 2021, compared to 15.1% before the pandemic, in 2019. The youth unemployment rate has also increased from 22.3% to 32.5% in the same period, while the NEET rate increased from 21.3% to 26.5%.

Finally, data about development sectors in Montenegro represents a significant baseline for determining the opportunities for further investment and development. Namely, the Economic Reform Programme for Montenegro (2021–2023) identifies the following development sectors: energy and traffic; agriculture, industry and services; the business sector and reduction of the informal economy; research, development, innovation and digital transformation; reforms related to economic integration; education and skills; employment and the labour market; social protection and inclusion, including health protection. MONSTAT's survey regarding businesses in Montenegro shows that ICT had a share of 8.21% of gross value added, which makes it the third-highest contributing business sector in Montenegro (after wholesale and retail trade, repair of motor vehicles and motorcycles, and construction). Moreover, it is important to note that ICT is second (preceded only by electricity, gas, steam and air conditioning supply) on the list of business sectors as regards the value of investments in business-related infrastructure. Thus, the baseline data places the ICT sector high on the list of priorities in the Montenegrin economy, which is indicative of the potential and willingness of companies to develop and invest in ICT and digitally based services and products.

A number of surveys have been implemented in Montenegro regarding digital skills in business. The main topics of interest and areas for improvement which have been identified through these surveys include: **digital literacy in business; obstacles to digital development; education and professional development in the area of digital skills; advantages of the usage of digital skills in business; obstacles with e-services; gaps in the labour market; hard-to-find skills; and necessary training and professional development courses.** Some of the main findings obtained through these surveys are presented below:[20]

Digital literacy in business

A low level of digital literacy:
22% Montenegrin citizens are completely digitally literate

A low level of internet use:
86% of the surveyed companies reported that fewer than 50% of their employees use the internet

A low level of use of e-government services:
59% of the surveyed companies reported that they use the internet to communicate with the public administration

Obstacles to digital development

A lack of awareness of businesses about the importance of digitalization

A lack of financial resources

A lack of assistance for digital development in companies from non-ICT sectors:
44.4% of the interviewed companies from non-ICT sectors reported that they need assistance for digital transformation of their business

20 This data was obtained through the following surveys: *ICT as a driver for the further development of Montenegro, IPSOS, 2018; "Survey on the use of and attitudes towards e-services in Montenegro", IPSOS, August 2019; Survey on hard-to-find ICT skills, Chamber of Economy of Montenegro, 2021.*

Advantages of the usage of digital skills and e-services in business

Faster business operation: 29% of the surveyed companies reported that digital skills and e- services save on the time required for carrying out certain activities/providing services

Higher flexibility and better availability of services and business operation: 17% of the surveyed companies reported that the use of digital skills and e-services provides more flexibility and availability

Complicated procedures for the use of electronic identification systems: 11% of the interviewed companies reported that procedures for use of electronic identification (digital certificate) should be simplified

Complicated procedures for the use of e-services: 9% of the interviewed companies reported that the use of e-services should be simplified and that they need more education in this area

Lack of information about the use of e-services: 10% of the interviewed companies reported that they need more information about use of e-services

Education and professional development in area of digital skills

A lack of interest in professional development in the area of digital skills among the active workforce: 27% of the overall population (18–65 years old) expressed interest in developing their digital skills for the purpose of ensuring higher competitiveness in the labour market

The education system does not meet the needs of the labour market: 56.8% of the interviewed companies reported that the education system does not provide the workforce with ICT and digital skills which meet the needs of the labour market

Employers' investment in the professional development of their workforce: 21.7% of the interviewed employees reported that their employers invest in their professional development

Insufficient integration and ICT in the teaching process at all levels of education

Insufficient representation of ICT courses for the general population

A lack of education of teaching staff in area of digital and ICT skills

A lack of ICT and digitally skilled staff in the education sector

Gaps in the labour market

Not enough employees for optimal business operation: 35% of the interviewed companies reported that they have employees with a sufficient level of digital skills

Businesses need more ICT-skilled labour: 86.5% of the interviewed companies reported that they need a greater ICT-skilled workforce

Facing difficulties with finding skilled labour: 97.3% of the interviewed companies reported that they are facing difficulties in finding an ICT workforce with a sufficient level of ICT and digital skills.

Inability of the labour force to meet the needs of the labour market: 11% of the currently employed citizens: have had to change their jobs; had lost their jobs; had to miss out on job opportunities because they did not have a sufficient level of ICT and digital skills required for certain positions

RESEARCH RESULTS

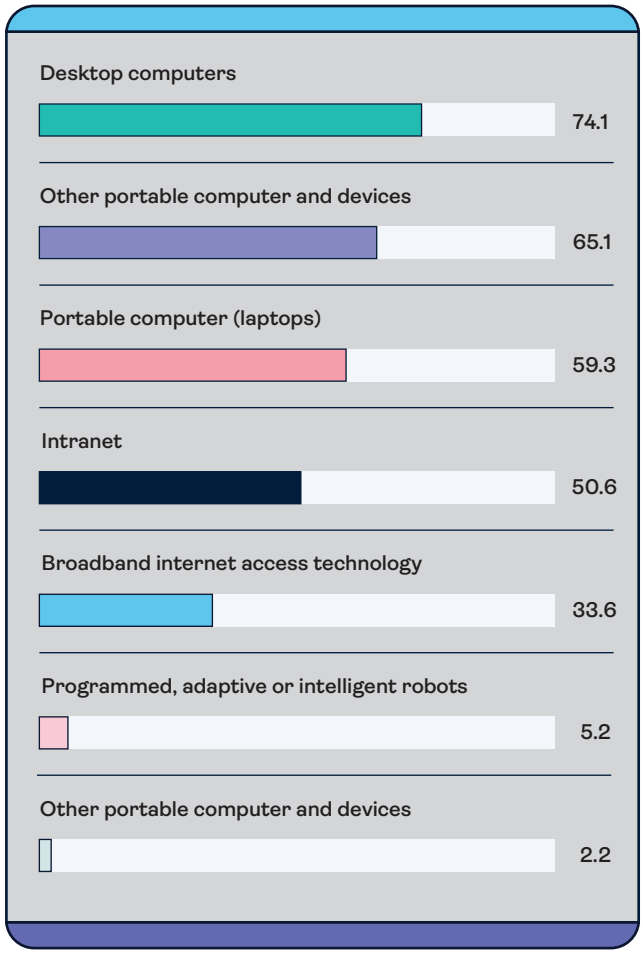
To better understand the current offer and needs for digital skills in the Montenegrin labour market, comprehensive research was conducted using quantitative and qualitative methods. The quantitative method (survey research) covered employers, while the qualitative research covered employers, but also other stakeholders from the field of education, digital skills and the labour market.

COMPANIES: ICT USAGE AND DIGITAL SKILLS

Data about the average share of employees from all sectors of activity who use ICT in their daily tasks shows that 74.1% of employees in all companies use desktop computers, followed by other portable computers and devices, such as tablets, mobile phones, smart watches, bracelets and other smart gadgets (65.1%), portable computers (59.3%) and company intranet (50.6%).

Employers were asked to assess the level of digital skills of their employees and rank them according to the official framework of basic,[21] advanced[22] and specialized[23] ICT skills. The average percentages of employees in non-ICT companies with certain ICT skills was assessed as follows:

Chart 01
Which ICT products and services do employees use in their everyday business activities? (%)[24]



21 "Basic ICT knowledge" means that employees are competent users of generic tools (e.g. office packages and internet-related tools, such as browsers and e-mail) needed to perform everyday business tasks. ICT is not the main job, but is a tool.

22 "Advanced ICT users" are competent users of advanced and often sector-specific software tools. ICT is not the main job, but is a tool.

23 "ICT specialists" are those employees who have the ability to develop, manage and maintain ICT systems. ICT is a major part of their job.

24 Multiple-choice question

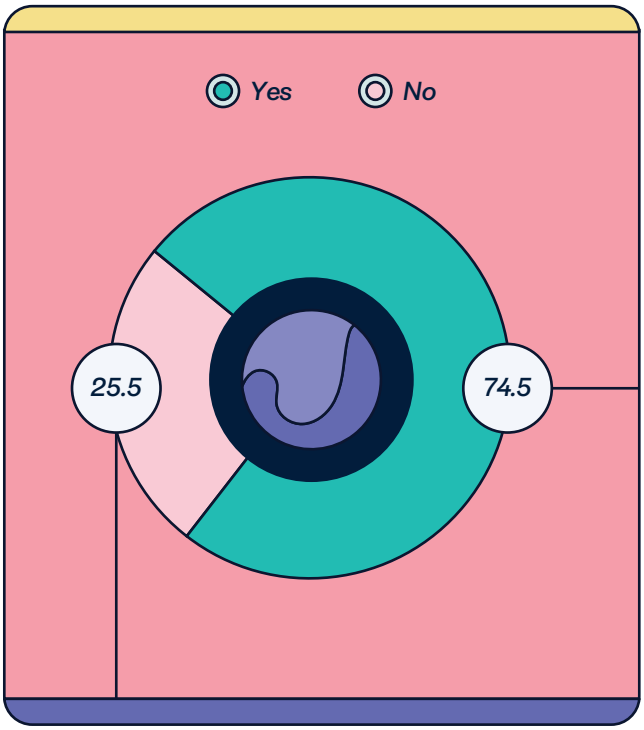
- **Basic ICT skills: 83.0%**
- **Advanced ICT skills: 52.5%**
- **Specialized ICT skills: 36.2%**

When it comes to specific sectors of activity, on average, the highest percentage of **employees with advanced ICT skills** was recorded in companies which operate in the sector of *wholesale and retail trade, repair of motor vehicles* (97%), followed by the sector of *professional, scientific and technical activities* (78%) and the sector of *administrative and support service activities* (80.5%), while the highest average share of **ICT specialists** was recorded in companies which operate in the sectors of education and professional, scientific and technical activities.

The average percentages of employees in **ICT companies** according to their level of ICT skills was assessed as follows:

- **Basic ICT skills: 85.8%**
- **Advanced ICT skills: 68.8%**
- **Specialized ICT skills: 47.5%**

Chart 02
Do you think that digital skills of the employees impact the business performance of the company? (%)



Most companies (74.5%) consider that the **digital skills of their employees impact the business performance of their companies**.

As the main reasons for this, they mainly state: "We live in a time of digital transformation and information revolution, it is important that they master basic digital skills" (24.5%), "Digital skills contribute to the faster solving of work tasks and the achievement of efficiency in work" (18.3%), "Digital skills influence the increase in the volume of work, the progress of the company, competitiveness and survival in the market" (11.6%), "Because they are the core of our business and activities" (7.4%), "Business performance, due to the dynamics and the technology itself used to perform business tasks" (5.4%) and "It has an influence due to communication with clients, promotion and training" (4.6%).

The most prominent sectors in which companies have identified the impact of digital skills on their business are: *Human health and social work activities; Administrative and support service activities; and Electricity, supply, gas, aerated water and air-conditioning*.

As the most common reasons why the **digital skills of employees have no impact on business performance** they cite the following: "*Employees' digital skills do not significantly affect business performance"* (34.4%); "*They are not necessary to perform the activity*" (30.3%); "*They are not necessary for our type of company and the services we provide*" (18.9%), etc.

Employers had the opportunity to rate 15 skills[25] which are, based on their perception, required in the business process by their employees. According to their perception, the following skills had the **highest average rating**: *communication via e-mail* (4.02); *searching, collecting and processing information by using ICT, e.g. the internet* (3.88); *use of Microsoft Word* (3.72); *use of spreadsheets, e.g. Microsoft Excel* (3.54); *marketing* (3.48); *use of programs/applications for e-business* (3.17) and *communication through ICT by using social networks* (3.1).

On the other hand, the following skills had the **lowest ratings** in terms of importance for business processes: *use of robots/specialized computers* (1.57), *3D printing* (1.69) *and use of software for design, calculations or simulations* (1.93).

25 On a scale of 1 to 5, where 1 is the least important and the 5 is most important

Chart 03
How important is it for employees to have the following skills necessary for business processes within the company (mean value on a scale of 1 to 5)

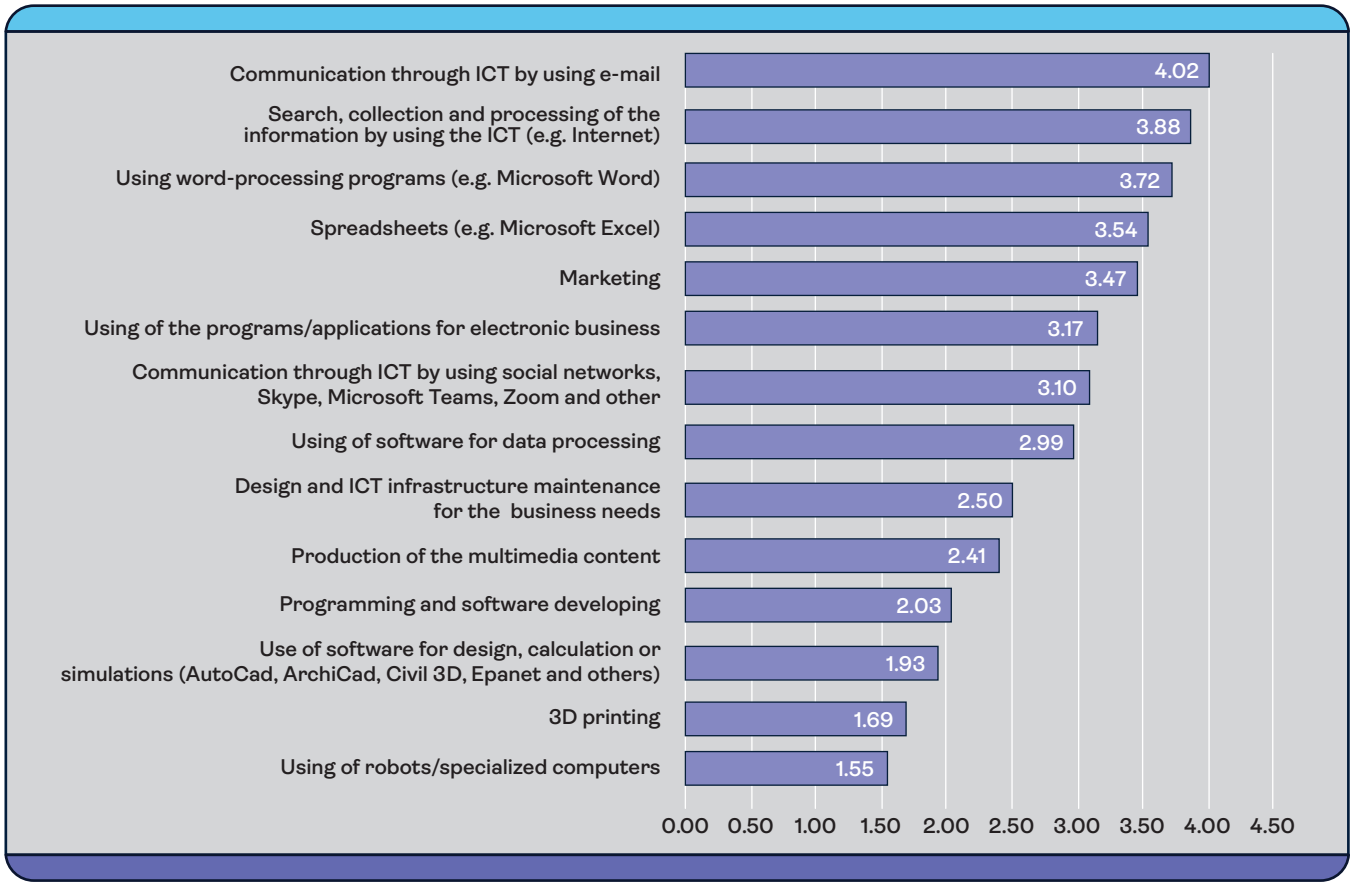
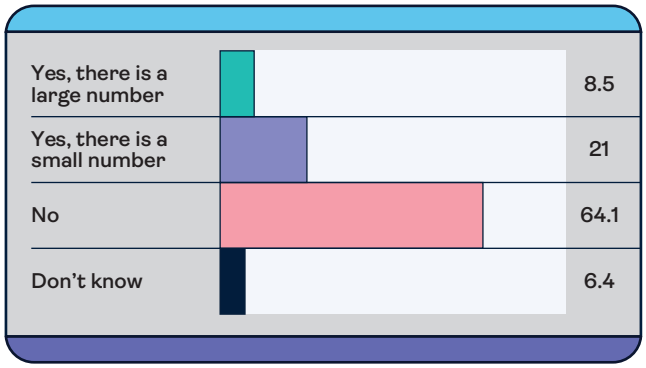


Chart 04
Are there currently employees in the business entity who do not have the digital skills needed to carry out regular business activities? (%)



The data from the quantitative survey shows that in more than half of the surveyed companies (64.1%), there are currently no employees who do not have the digital skills necessary to perform regular business activities. Furthermore, in 21% of the companies there are a small number of employees (up to 30% of the total number of employees) who do not have the digital skills necessary to perform regular business activities. On the other hand, 8.5% of companies reported that they have a high number of employees who lack the necessary digital skills.

EDUCATION AND DIGITAL SKILLS

The qualitative survey results provided several important insights into the relationship between the educational system and digital skills in Montenegro.

In primary education, textbooks for information technology are well designed, but thematic units are studied within the subject "*Information technology and technical studies*", which leaves less room for digital skills-related topics during the teaching period. The separation of information technology from technical studies would provide children with more classes and practical knowledge in digital skills.

Also, the topics of cybersecurity, personal data, cyberstalking and cyberbullying, or the impact of fake news on the decisions and behaviour of individuals are not sufficiently incorporated into education programmes in primary education. Also, textbooks and educational materials should be regularly updated.

"We need to start developing digital skills and awareness since elementary school, and it is necessary to change the content of books used in elementary school since they contain some outdated information (e.g. lessons about floppy disks)."

When it comes to **secondary education**, a certain **discontinuity** is evident when it comes to programmes that include digital skills, since in most schools at the IV-1 level of education, there are computer science classes for a maximum of two years at specialist secondary schools, and only for one year in general secondary schools.

Due to this discontinuity, students do not have the opportunity to acquire adequate knowledge that would recommend them for university departments in the field of technical sciences and digital skills in a broader sense.

"Students, apart from those in vocational schools, do not have any opportunities for **career orientation and practical skills**."

Exceptions are programmes in Vaso Aligrudić Secondary Vocational School, which is realizing seven different educational programmes, two of which are focused on ICT: Electrical Technician for the Development of Web and Mobile Applications, and Electrical Technician for Computer Systems and Networks. As part of the other five educational programmes, there are compulsory and elective modules related to digital skills and ICT.

In relation to the teaching staff, there are enthusiasts among the teachers, but still there are many who find it more challenging to adapt to changes and to engage in additional professional development activities.

This is recognized as a serious problem in schools because the key factor in digital skill education is that teachers must have enough knowledge and skills to teach relevant digital skills.

"Teachers must be provided with continuous assistance and education in the area of digital and ICT skills since most teachers in elementary schools and secondary schools do not have the necessary qualifications for teaching these subjects."

When it comes to vocational secondary schools, except for the secondary school for electrotechnical studies, the stakeholders also emphasized a problem related to the **infrastructural capacities**, computers and equipment, which are not powerful enough to be able to support all the programs that are studied within the curriculum (AutoCAD, ArchiCAD, software for 3D modelling, video production, etc.). Additionally, the Education Sector Analysis conducted by Ministry of Education and UNICEF shows that in 2018 Montenegro was among the five worst-off PISA countries regarding the availability of ICT equipment. The most recent data from June 2021 indicates a ratio of one computer per 16 students, on average, for primary, lower- and upper-secondary education.[26]

"Vocational education in the field of IT should be promoted. In order to have a good offer of experts dealing with the administration of networks and information systems, software development, etc., it is important to develop educational programmes not only at the tertiary level of education, but also to develop and promote vocational education programmes."

26 Education Sector Analysis 2015–2020, Ministry of Education and UNICEF, p. 93. www.unicef.org/montenegro/en/reports/education-sector-analysis-2015-2020

When it comes to **tertiary education**, faculties at all four Montenegrin universities provide one or more relevant study programmes. Of these four, three universities have specialized STEM-type programmes.

During conversations with representatives of higher education institutions, and through analysis of the offers of study programmes at various faculties of state and private universities in Montenegro, the important question that was posed was: "*Will all jobs in the future require, in addition to digital skills, programming skills*?" Trends in higher education in developed countries speak in favour of an affirmative answer to the question posed, **placing programming skills close to foreign language skills or communication skills**.

However, at the time of making this analysis, in Montenegro we still have jobs performed exclusively by programmers, who acquire knowledge in specialized study programmes in the fields of engineering, mathematics and information technology, as well as jobs that do not require knowledge of programming language syntax. However, **it is necessary to master computer logic and ways of problem solving, regardless of the business activity**. Finally, the basic digital skills remain defined through the eight key digital competences, whose adoption is implied, regardless of the type of job.

"We do not think that our students will achieve their future in coding, but they should start with coding, and then continue to develop and work in much more demanding disciplines, for which only a small number of people are specialized. I am hereby primarily referring to areas ranging from distributed computer systems, which represent the basis, all the way to cloud computing, followed by intelligent device networks. In this context, the students will develop a specific project by means of the available elements, such as Raspberry Pi's or Arduinos, or certain cheap devices which may be installed at home, whereby their selection of the device used for achieving this goal is not as important as the project itself."

"Students learn from outdated books and materials which contain information such as: the most popular browser (currently) is a browser which existed before Internet Explorer. Additionally, students at this faculty take exams on the subject of programming on a piece of paper – they write code on paper, instead on a computer since they do not have enough proper equipment for all students."

IT companies believe that university programmes should be more agile and updated, because the **workforce which comes from the universities does not fulfil the needs and requirements of the labour market**.

Curricula and teaching materials should be regularly updated, and **specialised study programs** should be developed regularly (artificial Intelligence, machine learning, Internet of Things, data analytics, data mining, blockchain).

However, **procedures for establishing study programmes are slow**. Namely, after the recommendations are taken from the market and the needs are identified, the curriculum design processes starts, followed by the phases of harmonization, verification, adoption and accreditation. When realization of that programme finally begins, the first generation of graduate students comes after three to four years. Thus, seven to eight years pass from the market research and needs analysis phase until the first graduates whose skills meet those needs enter the labour market, which is fundamentally inconsistent with the development of digital technologies that are advancing at an exponential rate – every two years the capacities of hardware and software double, which directly leads to an increase in the need to apply these tools and technologies in a wide variety of fields.

Universities offer various forms of **practical work experience** and are introducing subjects which address **soft skills**, and both are perceived as positively correlating with the employability of students.

Nevertheless, employers still claim that the workforce which comes to their companies does not have all the necessary capacities to quickly adapt to the process, but they need, on average, an **additional six months to start working independently. They emphasize a lack of basic business skills and soft skills, as well as a need for more practical work during their studies**. On the other hand, it was also noted that companies should show a higher level of willingness to mentor young people from the early stage of their studies.

What was pointed out by the employers through the qualitative part of the survey was that programmes in certain departments of applied studies do not involve other **essential skills** needed for employment/work, such as: business communication, writing emails or preparing PowerPoint presentations. Also, the interviewees mostly agreed that graduates do not have sufficiently developed skills of presentation, assertive communication, conflict resolution, etc., and that more attention is paid to this segment at private universities than is the case with the state university.

Finally, the overarching issue that should be addressed is "general resistance to change and innovation, which leads to incapacitation of part of the workforce to satisfy the needs of the labour market since digital and IT technologies are changing at a very fast pace".

Additionally, another significant problem is the fact that young people lack knowledge of **foreign languages**, even though knowledge of English language represents the basic pre-condition for working at any company.

When it comes to **'soft skills'**, the survey shows that these skills are lacking in most faculties and study programmes, thus it is necessary to modernize these programmes so that, apart from expert skills, these programmes would include: teamwork, critical thinking, communication, creativity, including the possibility to work on real-life projects (regardless of the fact that these may be 'small' projects initially), and motivation of students to learn and explore challenging areas of expertise independently.

"Currently, there are a large number of young people who complete their university education without having basic business skills, e.g. they do not know how to communicate adequately, how to properly write an email, their basic business and soft skills are not well developed, and these aspects should be worked on with special dedication."

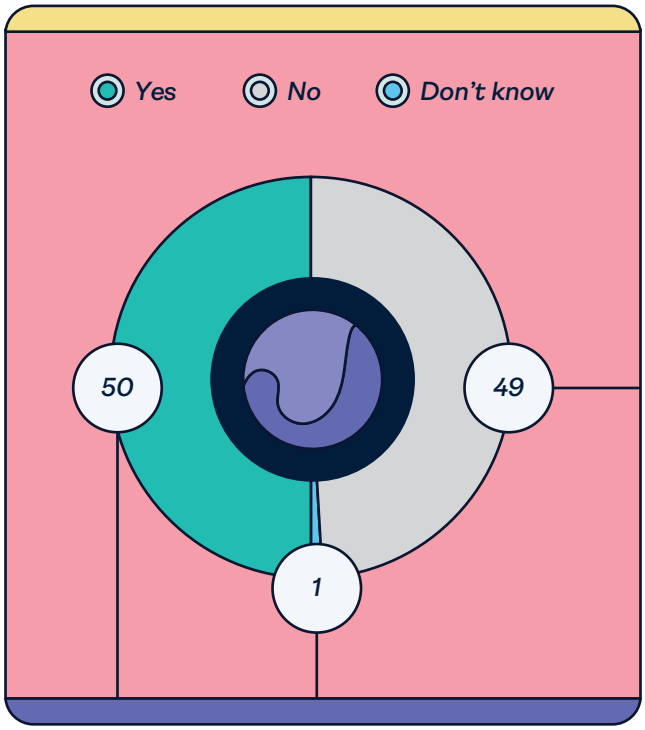
There is no precise data on what the market expects from STEM-oriented faculties, nor is it known how many people work in areas that involve digital and technical skills, or how many more are needed.

What was also mentioned as an issue is the lack of digital and creative skills in **public administration**, as well as a lack of understanding of the importance of digitalization.

Besides specific, labour-market oriented skills and knowledge, the interviewed stakeholders pointed out the overall need for development of skills related to data protection, internet safety, online behaviour and basic rules of using technology.

Half of the surveyed companies (50%) consider and believe that the Montenegrin education system produces a workforce with the required knowledge and digital skills in accordance with the market needs.

Chart 05
Do you think that the Montenegrin educational system produces workforce with the required knowledge and digital skills in accordance with the market needs? (%)



It is highly indicative to see that 49% of the interviewed companies stated that the education system does not provide a workforce which has the scope and level of digital and creative skills which meet the needs of the market. They state different reasons for this, among which they highlight: ***"Inadequate programmes in the education system", "Insufficient practical work during studies in this field and the programme doesn't keep pace with the developments in the field of IT" and "A lack of experts in this field".***

It was also noted by respondents that exchange of state governed records and data in the areas of employment and education qualifications in this domain should be improved.

When it comes to **providers of non-formal ICT education**, qualitative research has shown that they are divided into two groups: those who conduct training to attract young people who have just graduated from STEM-type faculties and to then retain the best of

them in their companies; and those who offer training on a commercial basis, regardless of age or educational background. Students who come from IT faculties already have basic or broad knowledge, which makes their knowledge relatively easy to improve in the direction of certain modern skills. Their courses change quickly, often from year to year, in order to stay up-to-date.

"We offer training in areas that we can really implement, for which we have lecturers and which we can later apply in the company. However, we still lack a lot of staff, especially those who would train the existing and future employees. The occupations and orientations that we need and which are deficient are: testers, data science experts (including all specializations), machine learning, business analysts, software engineers in a broader sense, and cyber security specialists."

This is in line with other finding from this survey, since it is discovered that development of digital skills and education in general is highly reliant on inter-sector cooperation at all levels, whereby it is absolutely necessary to include representatives of the private sector in all the initiatives in order to ensure that our joint efforts result in an improvement of the efficiency of the domestic labour market.

One of the gaps identified in relation to non-formal education is that it should be more inclusive and accessible to **groups in vulnerable situations** (e.g. women, the elderly, the unemployed, NEETs, Roma, people with disabilities, etc.), so as to avoid a digital divide.

"We need continuous and affordable opportunities for education, for obtaining both basic and advanced digital skills"

"We need to provide more free training for citizens, since only the unemployed and the public administration currently have access to free training in this area. We need to provide these courses to marginalized and vulnerable groups, people with low levels of qualifications, single mothers, etc. These groups must have the opportunity to obtain at least basic levels of digital skills and foreign languages."

It is of high importance to **build capacities of women** when it comes to digital skills, as well as to encourage them to engage in technical professions through education at STEM faculties and similar initiatives.

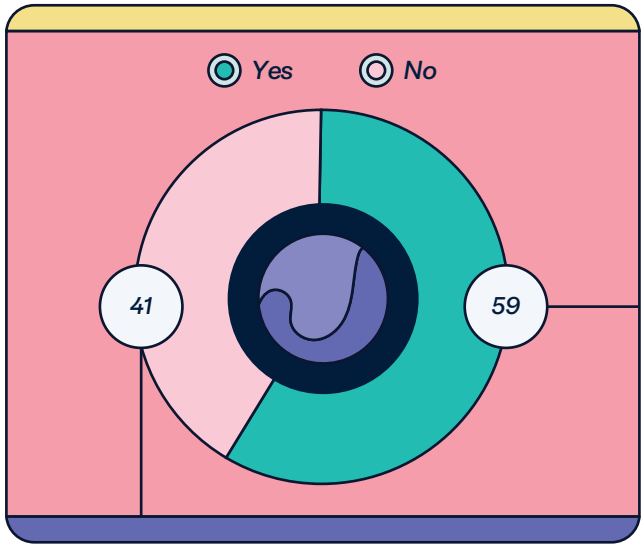
Continuous training of **public servants**, including management level, is of utmost importance as well. Besides digital literacy of all public servants, special attention should be paid to the capacities of the staff using digital systems.

Some training companies also identified the issues of **project-based training** and a **lack of more systematic matching of training with specific job offers** or identified market needs.

What was also identified by some respondents is a problem of trust in the learning outcomes of these programmes.

When it comes to the satisfaction showed by companies in regards to non-formal education, data shows a higher trust in the providers of non-formal education programmes ability to produce a workforce with the necessary digital and creative skills (59% companies are satisfied with non-formal education, compared to 50% in relation to the formal system of education), regarding which they state the following reasons: **"There are many quality training courses and programmes that teach practical knowledge and skills that will be applied in practice", "They focus on specific areas that are often not covered through formal education", and "The non-formal education system is more effective than formal education".**

Chart 06
Do you think that other digital skills training providers (outside the formal educational system) produce staff with the necessary knowledge and digital skills in accordance with market needs? (%)



Similar to formal education, it can be noticed that a large proportion of companies (41%) are not satisfied with the scope and level of digital and creative skills meeting the needs of the market which are provided by training providers outside the formal educational system. They highlight different reasons for this: **"Firstly, the labour market requires employees with basic skills and then everything else"; "A lack of interest among the unemployed"; "It is not enough to attend online training to gain adequate and necessary knowledge and skills"; and "The staff they produce are narrowly specialized and trained"**.

Qualitative research shows that employers also deem that formal and non-formal education institutions produce a workforce which has a certain level of knowledge. However, it is noticeable that this workforce is not completely prepared to work in private companies, but their skills and knowledge are better suited for work in the public sector. Also, private companies deem that young people are often under a certain type of pressure coming from their environment and parents when it comes to opportunities for improvement of their choice of company, thus there are **a large number of young people who would rather find their safe place in the public sector than choose to work in a private company**.

For the purpose of overcoming obstacles related to the lack of digital skills of the employees, the largest number of companies undertake activities such as **training and development programmes** within the company (45.1%), followed by activities of **changing work practice**[27] (25.6%) and **temporary employment of staff with the necessary digital skills** (21.9%).

When it comes to overcoming obstacles in terms of a lack of digital skills of employees, **28% of companies encourage and invest in the training of their employees**, while 72% of companies reported that they do not encourage and invest in the training of their employees.

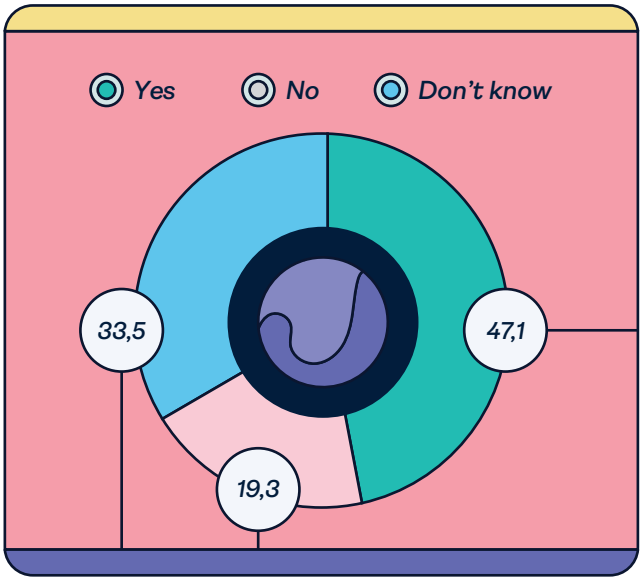
Most large companies (78.5%) encouraged and invested in the training of their employees, while a significant proportion of small companies (37.1%) invested in training their employees as well. The companies which most **invest in the training** and development of their employees come from the **sectors of electricity supply, ICT, administrative and support service activities,** and **education**. These companies mostly encourage development and investment in the digital skills of their employees through various **training events and course**s, as well as **investments in software solutions**.

Of the total number of the surveyed companies, 31.8% stated that they need to invest more in the digital skills of their employees. Among these companies, those **which most expressed the need to further improve the digital skills of their employees operate in the sectors of ICT (10.1%), professional and scientific activities (6.3%), administrative and support service activities (4.4%), and electricity supply (3.2%).**

The skills identified by freelancers to be the lacking include: cloud systems (specifically, AWS); skills related to the development of systems for cryptocurrency trading (in the broader sense), including all aspects related to blockchain technologies; IT project management; skills related to the manufacture of self-driving vehicles; artificial intelligence, including its implementation in different areas; all other skills which are not highly popular in Montenegro, i.e. skills in which the domestic IT community has still not shown interest.

The result of the quantitative survey shows that 47.1% of companies plan to train their employees to improve their digital skills. However, as many as one third of all companies still are not sure regarding the planning of training to improve the digital skills of their own employees.

Chart 07
Do you plan training of the employees in order to improve their digital skills in 2022? (%)



27 Redistribution of tasks between employees within the company

Companies which operate in the ICT sector (19.5%), electricity supply (9.1%) and professional, scientific and technical activities (7.1%) expressed the most willingness to invest in training their employees with the aim of improving their digital and ICT skills.

When it comes to areas of improvement and specific activities, the companies primarily suggested: practical training and courses for young people and the older generations; free education and reform of the education system with the aim of harmonizing it with the needs of the market; the necessity of institutional support for the entire process of digitalization; joint initiatives of business entities and scientific organizations; strengthening the IT community; implementation of activities aimed at motivating staff towards additional improvement and development of digital skills; complete digitalization; and raising the awareness of the importance of digital skills for better business performance.

DIGITAL SKILLS IN THE MONTENEGRIN LABOUR MARKET

Companies from all sectors of activity were asked to state whether they are facing difficulties with finding staff with an adequate level of ICT and digital skills. It is indicative that almost a fifth of the surveyed companies stated that the Montenegrin labour market does not provide people with adequate skills for their business. On the other hand, 82% of the companies do not have difficulties finding a quality workforce with the necessary digital and creative skills, mostly because they do not need staff with digital and creative skills, or generally they do not have the need for employment of new staff in this moment.

Companies which are facing difficulties with finding a workforce with the necessary digital and creative skills (18%) stated the following reasons for these shortcomings: “Insufficient knowledge and skills”; “Brain drain”; and “High school pupils and university students insufficiently prepared for the labour market”. Internal migration was also identified as an issue.

Chart 08
Are you facing difficulties to find quality work force with necessary digital and creative skills? (%)

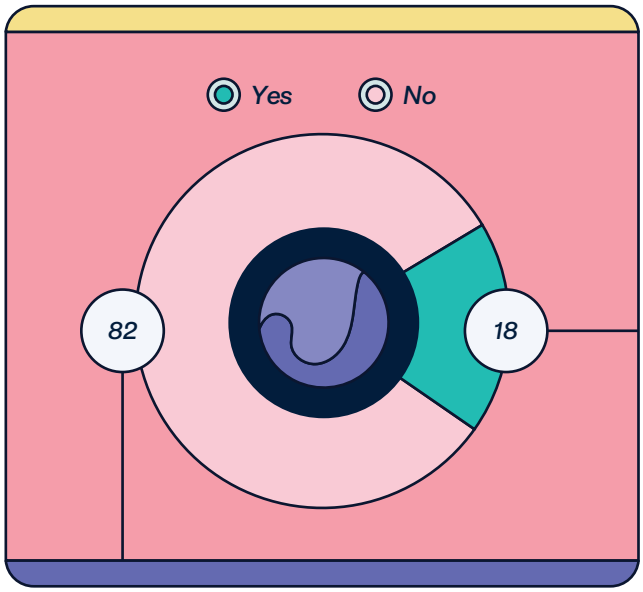


Chart 09
*Companies most commonly reported that their staff have a basic level of skills in the area of **programming** (83.58%), while they least commonly reported that their staff have advanced skills (65.68%) and specialized skills in area of content creation (54.17%).*

Information processing
Basic users: 74.02% Advanced users: 72.25% Specialized users: 62.28%
Communication
Basic users: 69.36% Advanced users: 73.21% Specialized users: 69.35%
Content creation
Basic users: 72.82% Advanced users: 65.68% Specialized users: 54.17%
Security
Basic users: 75.22% Advanced users: 69.69% Specialized users: 57.63%
Problem solving
Basic users: 69.11% Advanced users: 69.05% Specialized users: 64.56%
Problem solving
Basic users: 83.58% Advanced users: 61.12% Specialized users: 55.27%

When it comes to **skills which are present but should be improved**, the companies most reported: **use of Microsoft Excel** (53.7%); **email communication** (50.2%); **marketing** (48.9%); and **use of Microsoft Word** (48.3%).

On the other hand, **most companies consider that all digital skills should be improved, starting from 'soft' to 'hard' digital skills.**

Chart 10
Which of the following digital skills of employees do you think that are present but should be improved within the business entity[28]

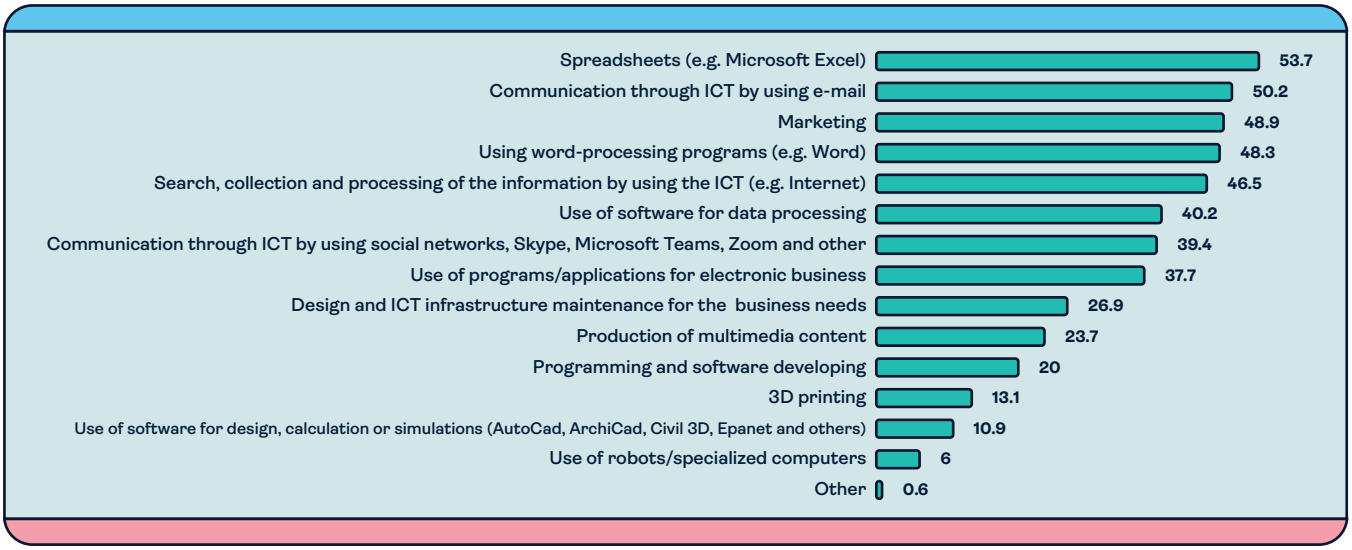
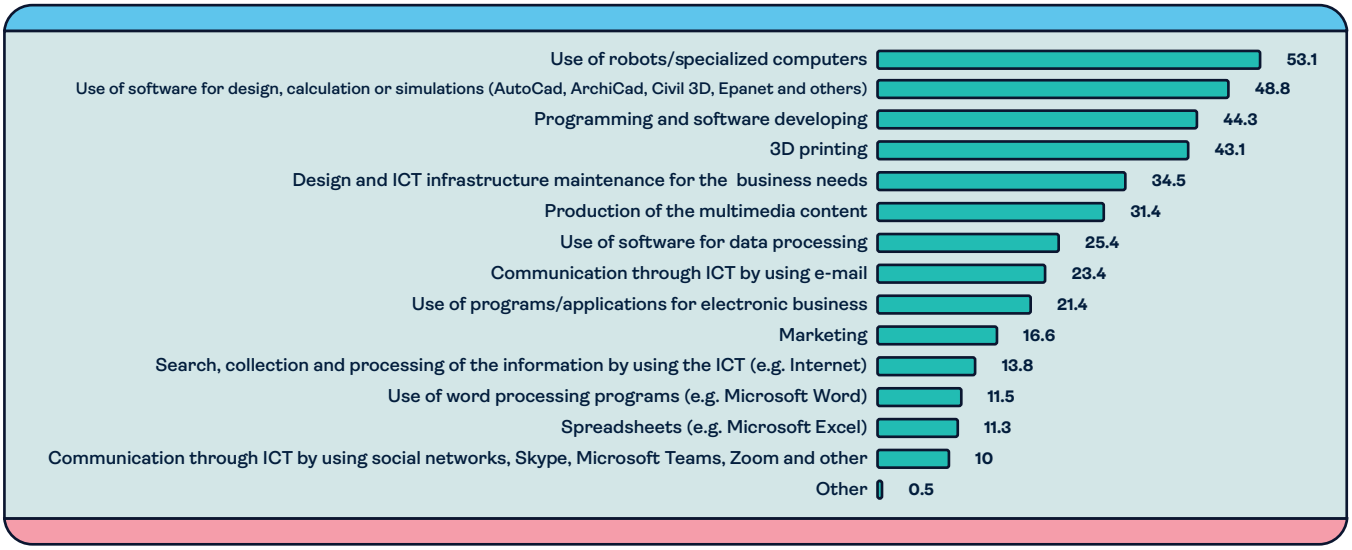


Chart 11
Which of the following digital skills of employees do you think are not sufficiently present within the business entity?[29]



28 Multiple-choice question

29 Multiple-choice question

E-businesses have been developing in Montenegro over the past three years, especially due to COVID-19, and data from the quantitative survey shows that businesses are already identifying gaps in terms of their needs and their employees' skills, thus this gap needs to be addressed so that all businesses may be able to successfully use government e-services, such as fiscalization, e-signatures, etc. On another note, it is indicative that companies from all sectors of activity (not just ICT) are starting to identify the need for the development of programming and software development skills, use of specialized software, etc.

The majority of companies are still not certain whether they are going to need new digital skills for ensuring competitiveness in the next five years (59%).

*On the other hand, 23% of companies stated that their employees are **going to need new digital skills** in order to ensure competitiveness in accordance with emerging trends, such as **digital and affiliate marketing, programming, cloud technologies and IoT, data processing and analysis, scrum, digital platforms, web development, video editing, graphic design, OTTs, Nagios and Radius**. A significantly indicative aspect of the emerging needs lies in the fact that companies are still **identifying basic ICT skills and knowledge of the Microsoft Office package** as an emerging need of the market.*

The majority of the surveyed companies consider that the greatest demand, when it comes to digital and creative skills, is for a **social marketing manager (33.7%)**,

Chart 13
For which digital and creative skills there is greatest demand? (%)

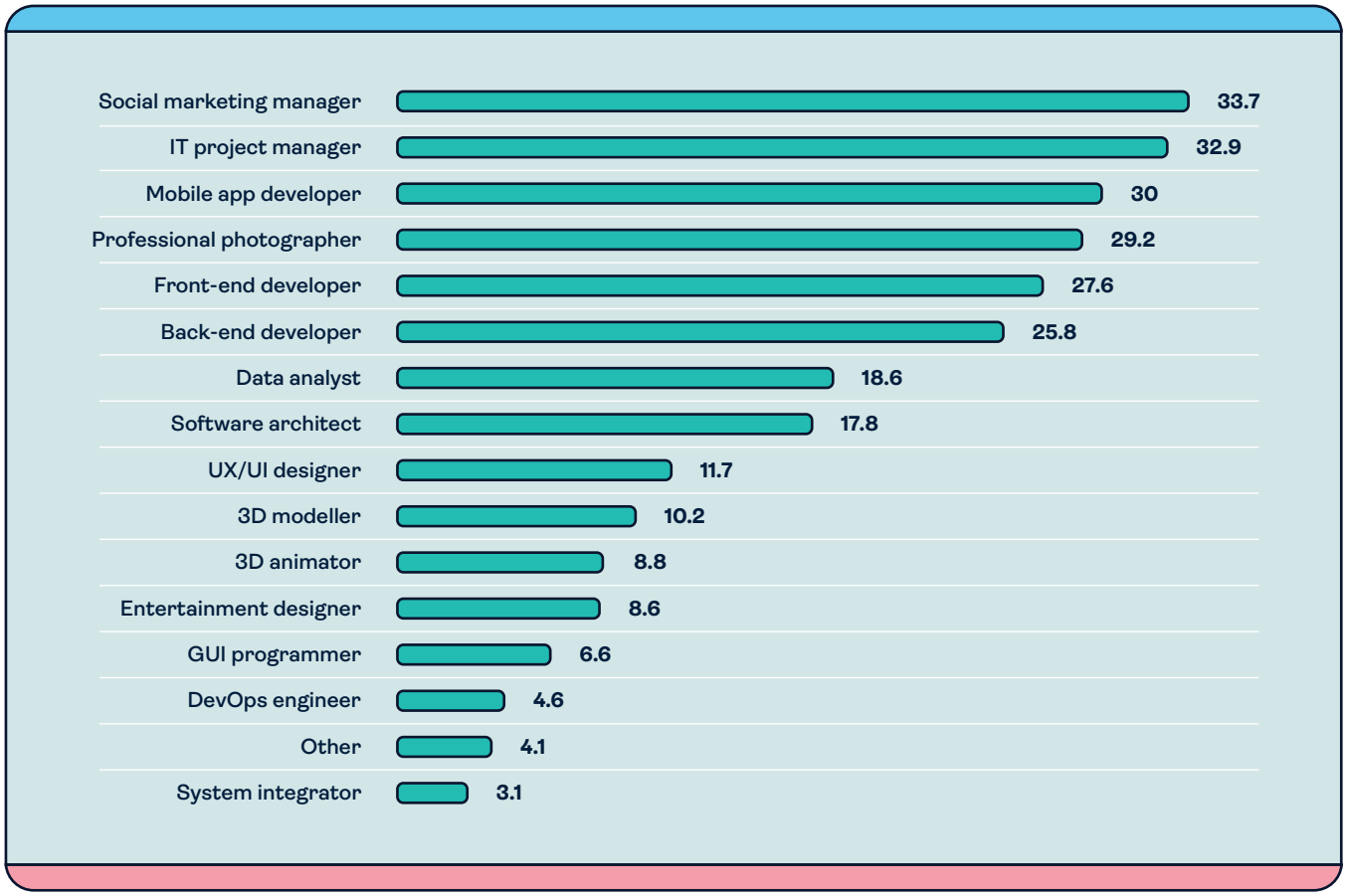
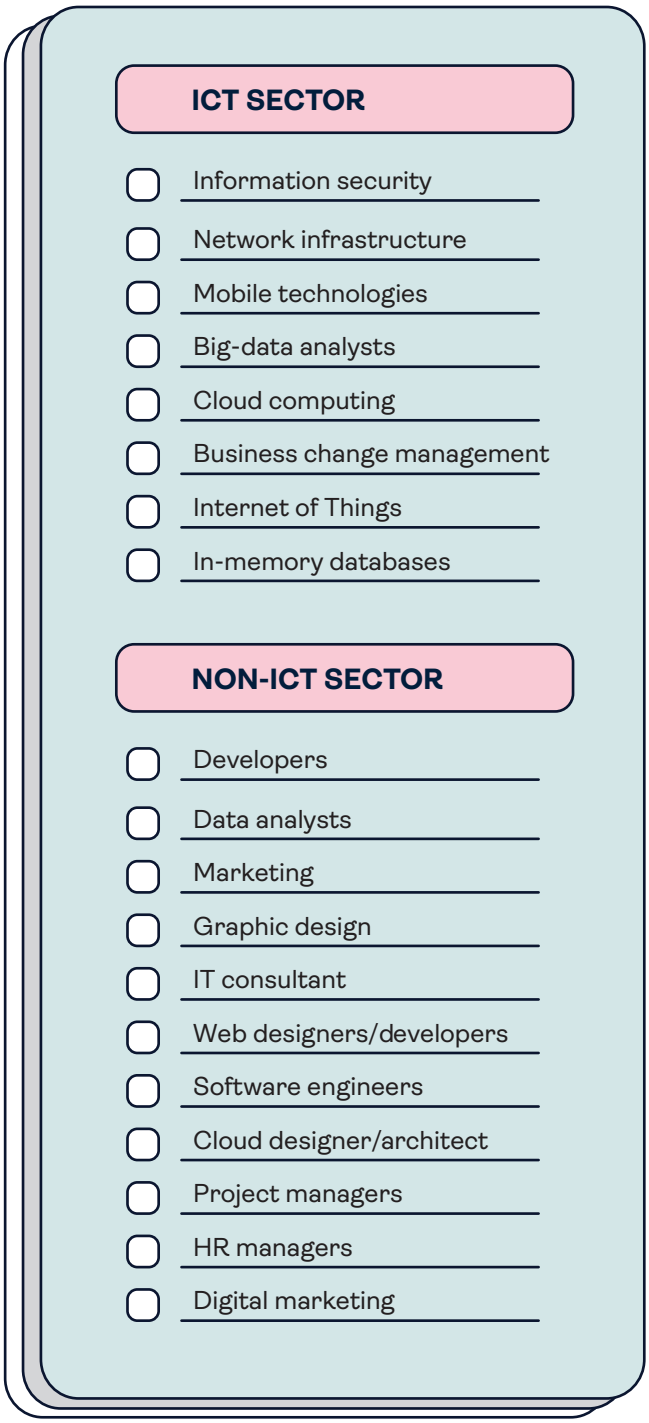


Chart 14
ICT occupations missing in the ICT sector and other business sectors



then for an **IT project manager (32.9%)**, followed by a **mobile app developer (30%)**, **professional photographer (29.2%)** and **front-end developer (27.6%)**.

The ICT sector (5.8% of the total sample) and companies which have their own designated ICT sectors (8.2% of the total sample) identified several occupations missing, presented in the chart below.

Apart from the abovementioned more general ICT **occupations, employers have also expressed the need to hire copywriters, UX/UI designers, quality assurance engineers, integrators (JR/SR), Java developers, .NET developers** and **AI specialists**. The significance of the above presented deficiency of occupations is indicative of a certain degree of integration and overlap of ICT specializations between ICT companies and companies from other sectors, which directly points to the scope for improvement and additional development of general businesses by means of integration of more specialized ICT and digital skills into modern businesses.

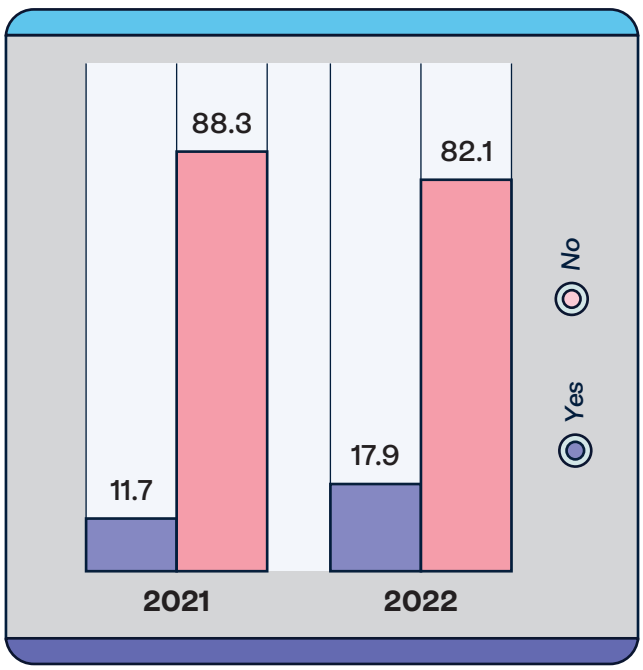
The issue of **competitiveness of salaries** in the IT sector in Montenegro was emphasized recently when companies from the region and other foreign countries joined the market. These companies offer very high salaries which cannot be matched by local IT companies. Additionally, salaries are not competitive in comparison to the salaries provided by start-up companies which are entering the market quickly and easily, which have foreign funds and which thus provide very good opportunities for earning, which additionally increases the fluctuation of the workforce.

Freelancers represent a significant segment of the ICT community in Montenegro, whereby they are the stakeholders with the most prominent regulatory and practical gaps. Namely, these stakeholders require **more institutional 'attention'** and dedication in terms of **development of a legislative framework** which would acknowledge their needs (such as payment systems or simple solutions for regulation of their legal status) and enable them to have an adequate status in the Montenegrin labour market. Additionally, these stakeholders represent a significant 'loss' for the Montenegrin labour market since they are not provided with a business or a professional environment which would be enabling and challenging enough for them to provide and develop their skills in the domestic labour market, but we are instead risking a high degree of **brain drain and loss of skilled the domestic workforce due to a lack of institutional and regulatory support.**

Interviews and focus groups revealed that over the past few years, i.e. in the period when the process of digitalization has become significantly faster than before, it is evident that there is a significant lack of web developers (both junior and senior ones), whereby even those web developers who are present on the market mostly have only the core and "vanilla" knowledge from the area of programming languages, while the domain of frameworks (React, NodeJS, Laravel, etc.) is not available at universities, thus it is especially difficult to find developers with these skills. Gaps are also noticeable in the context of occupations which require a **multidisciplinary approach**, such as product owners, UI/UX designers, project managers, artificial intelligence specialists, machine learning, IoT, etc.

The majority of the surveyed companies reported that they do not have plans to hire new staff in 2021 or in 2022. On the other hand, those companies (17.9%) which have plans to employ new staff in 2022 have needs for different kinds of positions, but the common denominators for these positions are that they require **university education** (71.6%) and **basic digital skills** (30.8%).

Chart 15
Are you planning to employ new staff by the end of 2021 and in 2022? (%)



Stakeholders also provided their perspective on the digital and ICT skills and occupations that Montenegro is currently lacking, but which have either been in demand for some time (and for which we do not have a sufficient qualified workforce) or which are going to be emerging in the following years. The skills they identified range from basic digital skills, such as basic literacy (use of email, the Microsoft Office package), digital marketing, project management, and soft skills, to more specialized skills – programming, AI, machine learning, etc. An overview of the skills and occupations identified by the focus groups participants is provided in the chart below.

Chart 16
Which digital and ICT skills are lacking? (focus group findings)

Basic skills

- Email communication
- Microsoft Office package
- Project management
- Digital marketing
- E-commerce
- Design, visual arts
- Illustration
- Marketing
- Business analytics
- Soft skills (communication, presentation)

Specialized skills

- UI/UX design
- Artificial intelligence
- React
- Laravel
- The Internet of Things
- Disruptive technologies
- Data mining
- Data analysis/data science/databases
- JR/SR developers
- Mobile app developers
- Front-end/back-end developers
- Web developers
- Product owners
- Scrum masters
- Agile development
- Testers
- Quality assurance
- Software engineers
- 3D modelling/3D printing
- Security

THE IMPACT OF DIGITAL TRANSFORMATION AND COVID-19 ON BUSINESSES

For the largest number of companies (34.7%), digital skills and tools are significantly important for business activities in a business environment affected by the COVID-19 pandemic. Additionally, 37.6% of companies consider that digital skills and tools are either key or very important for business activities in such an environment. However, most companies (84%) did not increase their investments in the training of employees related to digital skills. Reportedly, these circumstances also influenced an increase in demand for employees who have the necessary digital skills.

The increasing importance of digital skills is noticeable among the surveyed companies, since 16% of them stated that they had started investing more in the training of their employees in this area since the beginning of the COVID-19 pandemic. Also, 17% of companies stated that COVID-19 had influenced an increase in demand for employees that have necessary digital skills.

Chart 18
How important do you think the digital skills and tools are for your business entity, in a business environment affected by the COVID-19 pandemic? (%)

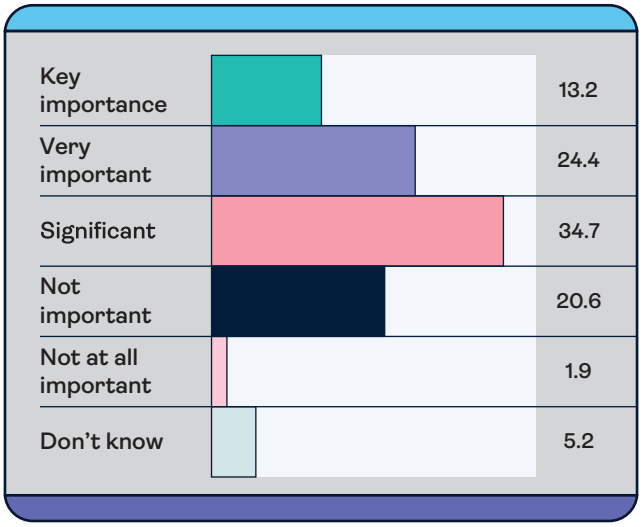


Chart 18
Has the percentage of invested financial resources for the training of employees related to digital skills increased since the beginning of COVID-19 pandemic, compared to the period before the pandemic? (%)

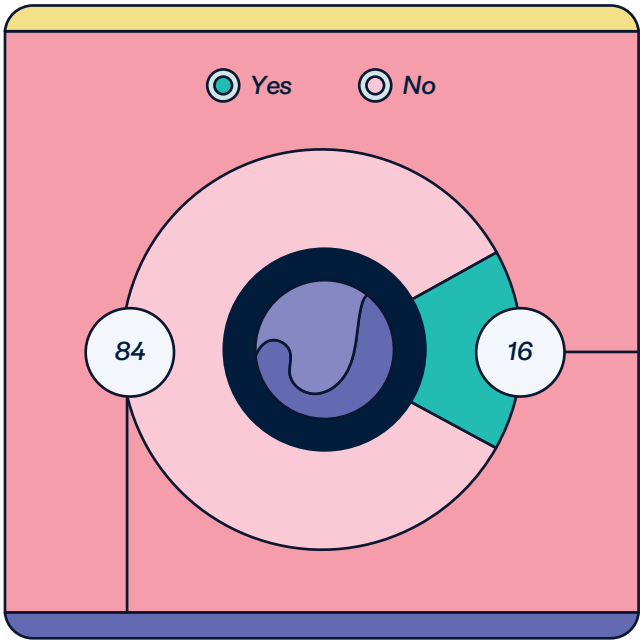


Chart 19
Has COVID-19 influenced an increase in demand for employees that have necessary digital skills? (%)

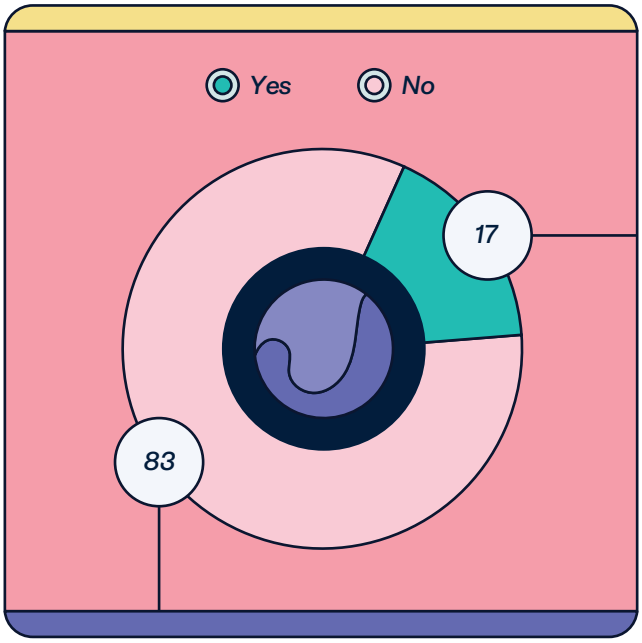


Chart 20
In which areas has there been a greater need for digital skills of employees since the beginning of the COVID-19 pandemic?[30] *(%)*

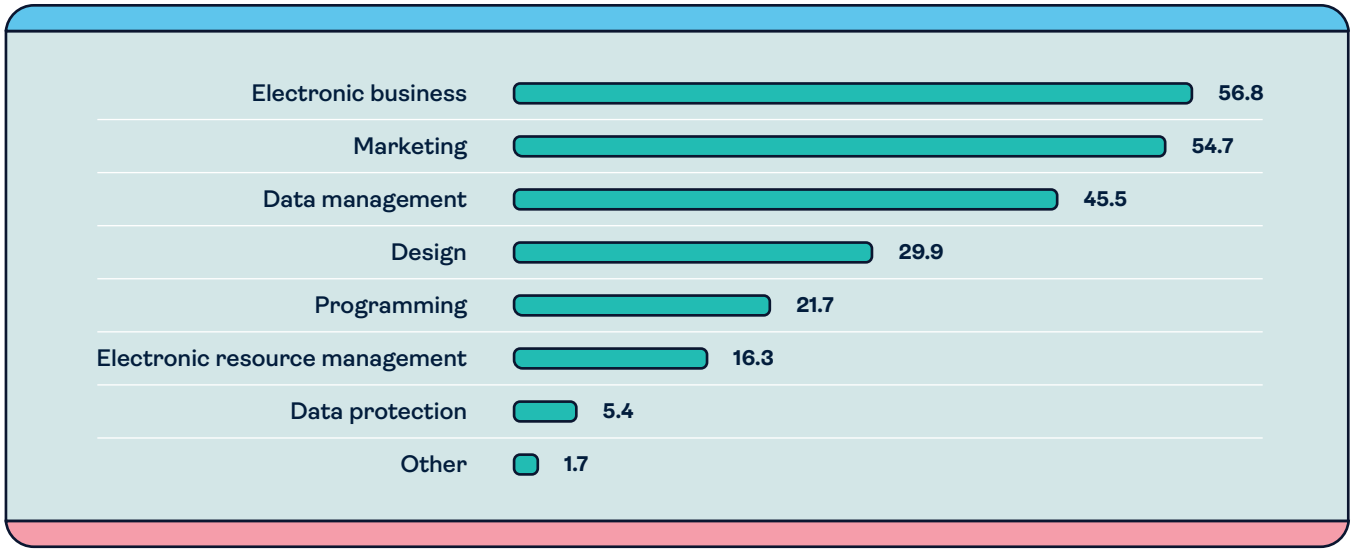
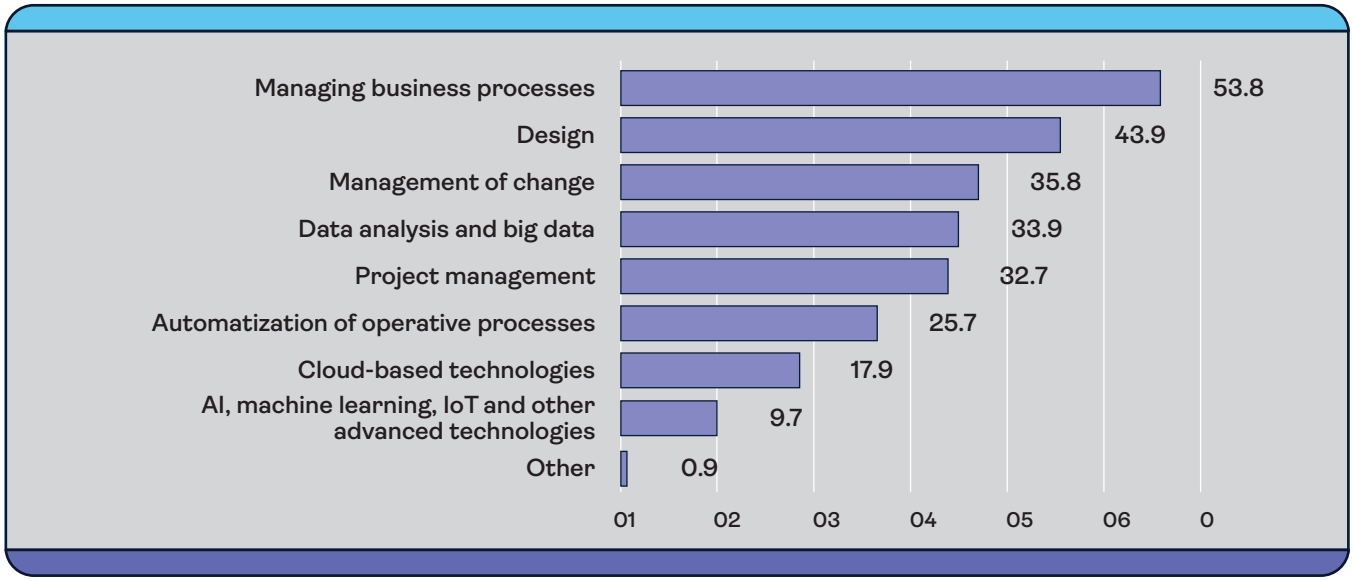


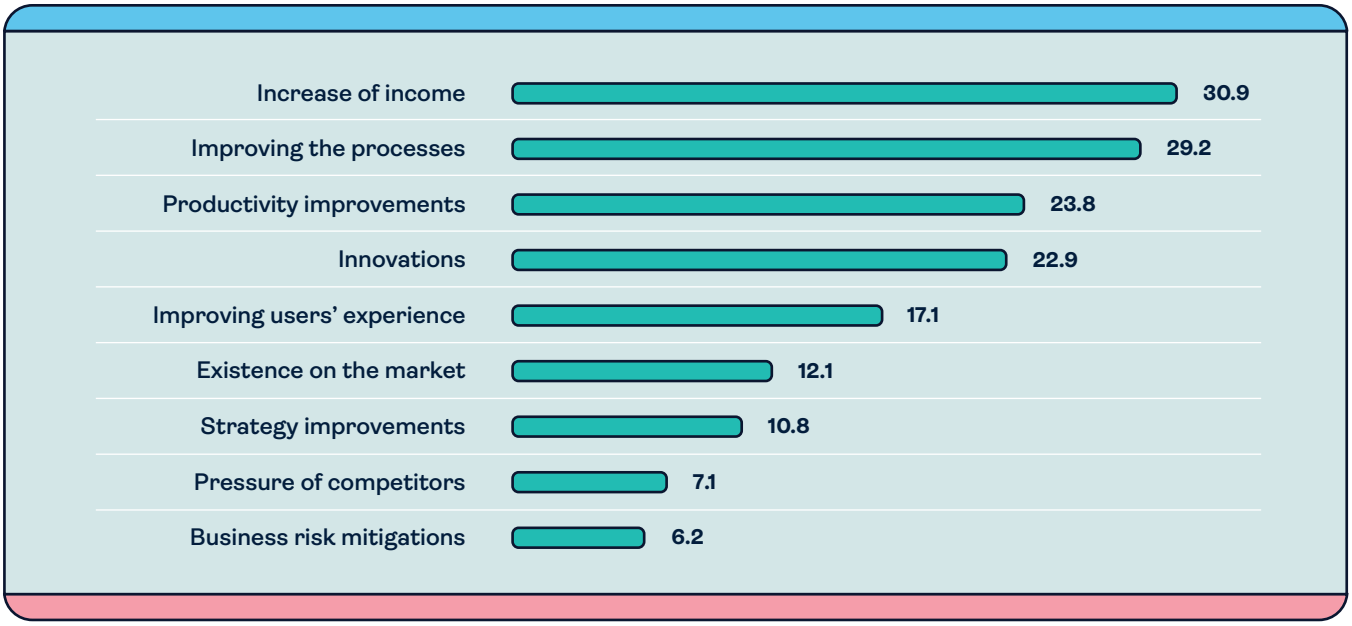
Chart 21
Digital skills that companies consider important for their operation in the modern business environment[31] *(%)*



30 Multiple-choice question

31 Multiple-choice question

Chart 22
The three key reasons to start digital transformation in the company (%)



Under the influence of the COVID-19 pandemic, companies have developed a greater need for the digital skills of employees, especially in the areas of ***e-business (56.8%), marketing (54.7%)****, and* ***data management (45.5%).***

When it comes to employees' digital skills in the modern business environment, companies consider that the following skills are essential: ***managing business processes (53.8%), design (43.9%), management of change (35.8%) and data analysis*** *and* ***big data (33.9%).***

Additionally, the pandemic led to an increase in investments in new technologies, which was reported by 17% of the surveyed companies.

When it comes to plans for digital transformation, most companies identified ***three most useful ways to drive transformation****, the first being* ***internal training of employees****, the second – by* ***employing a new qualified workforce*** *and the third – by* ***engaging consulting companies in the field of management****.*

The companies which are planning for digital transformation listed **an increase in income, improving processes** and **innovations and productivity improvements** as the three key reasons to start digital transformation in the company.

The obstacles to setting up and implementing digital transformation within the company were identified as: **a lack of financial resources, a lack of institutional support** and **a lack of time for training and implementation**.

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Annex I – RESEARCH METHODOLOGY

Quantitative survey methodology

A quantitative survey was conducted during the period from 29 October until 29 November 2021 among companies in the pre-defined sectors and subsectors of activity including: C (Manufacturing); D (Electricity, gas, steam and air conditioning supply); G (Wholesale and retail trade; repair of motor vehicles and motorcycles); H (Transportation and storage); I (Accommodation and food service activities); J (Information and communication); M (Professional, scientific and technical activities); N (Administrative and support service activities); and Q (Human health and social work activities). Special attention was paid to companies which operate in the ICT industry and to companies which have their own ICT departments, which was done in order to collect data not only about basic and medium-level digital and ICT skills, but also about specialized ICT skills in the Montenegrin market.

The consultant implemented the survey via a combination of direct face-to-face communication with the respondents and email communication, due to the constraints imposed in regard to the COVID-19 pandemic and the corresponding limited availability of a number of companies. The data collected was thoroughly revised and verified by the survey coordinator, while data outputs were prepared by means of SPSS.

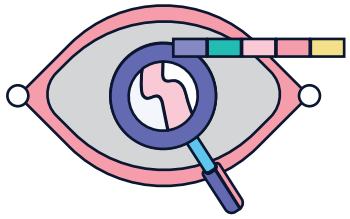
Database of active companies, all of which are registered in the Central Registry of Business Entities and presented in the form of a list of enterprises in Montenegro, was used for defining the frame population. In order to complete the list of enterprises, the consultant used publicly available data from the Central Registry of Business Entities and Company Wall Business.

The target population included a list of 14,460 enterprises with the smallest share being made up of companies with 250 or more employees, and the largest share of companies which have fewer than 10 employees. Stratified random sampling was used for the purpose of creating the sample, whereby the companies were stratified according to the type of activities, enterprise size and geographical region. Stratification and allocation of all other enterprises was done according to optimal (Neyman) allocation, using the number of employees as an auxiliary variable. When it comes to large enterprises – those with 250 and more employees – all of them were included in the sample (exhaustive stratum). The final sample included a total number of 351 enterprises, which is representative of Montenegro and ensures data validity and generalization.

To reduce bias arising from non-responses, all data was weighted by the sectors of predominant business activities, classified by the number of employees, regions and municipalities so that the weighted structure corresponds to the selected sample.

After completion of the survey and checking of the collected data, the project team conducted data entry, while the processing was realized in the SPSS statistical program.

The survey questionnaire was designed in accordance with the digital competence framework defined as part of DIGCOMP, whereby a range of basic, intermediate and specialized ICT skills were included in the questionnaire. Additionally, the questionnaire included a table with descriptions/a self-assessment tool in order to facilitate understanding of the targeted skills. Moreover, the questionnaire was designed in such a way as to collect information about the composition of the existing and planned workforce by gender and qualifications, as well as including a section about investments and education of staff. Finally, the questionnaire had a specific section which targeted ICT companies and companies which have their own ICT departments, so as to obtain all the relevant information about the needs and opportunities in regard to advanced ICT skills in the Montenegrin market.



Qualitative survey methodology

The qualitative survey included in-depth interviews and focus groups with stakeholders from all the relevant groups of institutions and organizations, ranging from institutional and policy-level stakeholders, the labour market, education, HR and recruitment agencies, business associations and civil society, employers and young people.

These stakeholders were identified throughout implementation of the project, in cooperation with UNDP, whereby further project activities and communication with the identified stakeholders showed the need to interview additional stakeholders, while some of the initially identified stakeholders were not willing to take part in this project.

The general stakeholders identified in the context of this project include: businesses/employers, academia, providers of official and unofficial education in the areas of ICT, digital skills and the creative industry, business associations, freelancers, centres of excellence and public institutions.

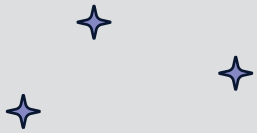
The total of 23 stakeholders were interviewed and these were divided in three sub-groups – relevant institutions, educational institutions and international organizations. The goal of the in-depth interviews was to obtain relevant information across all levels of institutional responsibility and governance in the context of digital transformation.

In-depth interviews were completed over the period from 1 November to 8 December 2021, whereby all stakeholders were personally contacted, informed about the overall project and its goals, which was followed by direct interviews. The consultant used a combination of direct face-to-face interviews (in person) and interviews via Zoom, which was done due to the constraints imposed by COVID-19.

Questions for the in-depth interviews were developed in accordance with the stakeholders' respective roles and position in the system, as identified in desk research. Consequently, a set of separate questions was designed for each group of stakeholders, whereby the topics for discussion ranged from institutional responsibilities, strategic and practical activities aimed at development of digital skills, to the existing and planned frameworks and activities, their respective capacities, the position and role of digital and ICT skills in the Montenegrin labour market and education system and the overall process of digital transformation.

The methodology for the focus groups included conducting focus groups in person, whereby all stakeholders were directly contacted, informed about the project goals and invited to take part in the focus groups. Focus groups were held in the period 1 to 9 December 2021. Additionally, the consultant provided the option for participants to take part in focus groups via Zoom (due to COVID-19 constraints), thus a few participants joined the meetings online and they fully participated in the discussion. Six specific groups of stakeholders were invited to focus groups: employers; providers of non-formal education in the area of ICT and digital skills; civil society organizations; HR companies and employment agencies; young people; and freelancers. It is important to note that freelancers provided their answers to the defined questions via an online questionnaire.

Questions for the focus groups were defined for each individual group of stakeholders, whereby the topics for discussion ranged from their perspective on digital skills in the Montenegrin labour market (current needs and emerging needs), to opportunities for improvement, education, gaps and opportunities, etc.



DIGITAL SKILLS
Needs and Opportunities