NALAS Network of Associations of Local Authorities of South-East Europe

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Austrian Development Cooperation

KDZ Centre for Public Administration Research

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FACTSHEET

# DIGITAL SKILLS and COMPETENCES in LOCAL GOVERNMENTS

## Empowering Local Transformation for Inclusive Growth in the Western Balkans and Moldova


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# Introduction

The digital transformation at the local level is a vital process for fostering economic growth and accelerating the European Union integration of countries in the Western Balkans and Moldova. This factsheet builds on the study *Empowering Progress with Digital Transition in Western Balkan and Moldova Local Governments* However, the factsheet focuses on a key component for driving progress: skills and competencies, the benefits of partnerships, and the creation of ecosystems that accelerate the transformation process.

To elaborate on this factsheet, the authors employed desktop research and actively engaged members of the NALAS Digitalization Working Group, who provided valuable insights on all topics covered. The factsheet also incorporates measurements and analyses conducted by the EU for the Western Balkans and Moldova, alongside best practices that have demonstrated successful outcomes and are applicable or recommended to local governments within the EU.

Digital skills and competences are essential for achieving progress, becoming competitive, and keeping pace with the transformation while meeting the objectives outlined in the EU's Digital Decade. Digital skills are assessed using various metrics to evaluate current levels, identify lagging areas, and propose solutions based on best practices.
It is important that these assessments not only serve as indicators for reporting to the EU but also provide a realistic understanding of the digital inclusion or exclusion in each geographic area. Barriers to digital inclusion could be related to age, urban-rural divides, gender, and other factors. For employees in local governments, improving their skills is both necessary and achievable, provided it is measurable and supported by targeted training programs.

Digital skills are no longer a choice but a necessity for social inclusion, employability, and economic growth. The COVID–19 pandemic exposed deep inequalities in digital competencies, underscoring the urgent need to bridge these gaps.

This challenge cannot be overcome without coordination on all level of government and coordination with EU and EU peers for exchange of knowledge on good practices. It is necessary that education institutions, businesses, and civil society come together and design training programs that take into consideration the demands of the local labor market, local conditions, demographic barriers and aging population. In this way, the development of digital skills will be relevant and effective.

Local and regional governments have a very important role to play. They are in the best position to cocreate with other local stakeholders and to adapt digital strategies to the needs of their communities, making full use of partnerships and resources.

Reinforcing digital competencies in SMEs will support not only their growth but also their integration into wider local and regional digital networks.

Furthermore, the implications of digital skills in media literacy are far-reaching. They protect democratic principles, guarantee critical thinking, and help people overcome bias and polarization. Investing in these skills is an investment in a more informed and resilient society.

Hence, this factsheet examines the critical role that digital skills play in shaping inclusive and sustainable communities and outlines actionable strategies for their development and implementation. The authors believe that this factsheet will contribute to the next steps in digital transformation at the local level, helping to harness best practices, recommendations, and knowledge to bridge the gap in the quality of life for citizens of the Western Balkans and Moldova through advanced technological solutions.

Lastly, the authors extend their sincere gratitude to the teams at KDZ and NALAS for the opportunity to produce .this factsheet and present it to the public

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# DIGITAL COMPETENCE FRAMEWORK FOR MUNICIPALITIES

> *"Not understanding digitalisation, or understanding it wrongly or too late, is probably the greatest risk of all" (Joël Luc Cachelin)*[2]

The concept of "media literacy"[1], which originated in the 1980s and 1990s, has by no means lost its legitimacy with regard to today's "media system", as it is still essentially about the ability to critically evaluate media, to actively use it and to understand its functions and structures. However, the frame of reference has changed: While the focus 30 years ago was still clearly on electronic mass media - especially television, video and radio - these centrally controlled media offerings in particular are now becoming less and less relevant. The target groups of the former "leading media" are increasingly migrating online as "users": X and Instagram, Snapchat and WhatsApp, YouTube, Netflix and Facebook are having a greater impact on media use, communication behavior and the way many people form their opinions.

Another important difference to the earlier media literacy debate is that the functional scope of today's (digital) media technologies goes far beyond the production, communication and reception of media content. Think of artificial intelligence. Controlling a smart home or car via voice-based assistance systems (such as Alexa or Siri), for example, or measuring and analyzing body data via smart watches, researching, rating and booking a hotel online or submitting an online tax return: all of this is essentially also "media use", but in a completely new context of application and meaning. The skills and competences required to use such applications cannot be adequately described as "media skills", because on the one hand they require operational-technical skills (e.g. to set up a smart home network or a Wi-Fi router), but on the other hand media skills also stand for an understanding of the systemic underlying data processing processes, algorithms (GenAI) or security aspects (cyber security).

We are currently facing a significant digital skills gap in Europe. Most jobs nowadays require some level of digital skills, particularly in the context of the digital transition, and following the 'digitalisation push' by companies as a reaction to the coronavirus crisis whereby almost half of adult workers saw new digital technology introduced at their workplaces[3].

What is needed is a contemporary understanding of these skills that considers the fact that today's digital "media" are services and systems that permeate almost every aspect of everyday life - be it shopping or travelling, learning or social life, voluntary work in associations or political parties and daily work in every branches.


**Figure 1: EU Key Competence Framework for Lifelong Learning**[4]

1 Media literacy as: a) media criticism, b) media studies, c) media use and d) media design, see Baacke 1999; Krämer, Jordanski & Goertz 2017, p. 23

2 https://wissensfabrik.ch/

3 http://data.europa.eu/doi/10.2801/253954

4 https://joint-research-centre.ec.europa.eu/scientific-activities-z/education-and-training/digital-transformation-education/digital-competence-framework-citizens-digcomp_en

To keep pace with technological advancements, public authorities at central and local level should promote continuous learning and upskilling through innovative tools, services, and training programs. Additionally, a thorough assessment of current digital skills can help identify specific areas where skill gaps exist.

## Digital Economy and Society Index (DESI)

From 2014 to 2022, the DESI summarised indicators on Europe's digital performance and tracked the progress of EU countries. The Digital Decade policy programme concretes targets and objectives for 2030 and guides Europe's digital transformation (Digital Compass[5]).


| | |
|---|---|
| **Secure and sustainable digital infrastructures**<br>· Connectivity: Gigabit for everyone<br>· Cutting edge Semiconductors: double EU share in global production<br>· Data - Edge & Cloud: 10,000 climate-neutral highly secure edge nodes<br>· Computing: first computer with quantum acceleration | **Digital transformation of businesses**<br>· Tech up-take: 75% of EU companies using Cloud, AI, or Big Data<br>· Innovators: grow scale-ups & finance to double EU Unicorns<br>· Late adopters: more than 90% of SMEs reach at least a basic level of digital intensity |
| **Digitalisation of public services**<br>· Key Public Services: 100% online<br>· e-Health: 100% of citizens have access to medical records online<br>· Digital Identity: 100% of citizens have access to digital ID | **Skills**<br>· ICT Specialists: 20 million + gender convergence<br>· Basic Digital Skills: min 80% of population |

As of 2023 DESI is now integrated into the State of the Digital Decade report and used to monitor progress towards the digital targets.[6]

The first report on the State of the Digital Decade provides a comprehensive look at progress towards achieving the digital transformation to empower a more digitally sovereign, resilient, and competitive EU.[7]

5 https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52021DC0118

6 https://digital-decade-desi.digital-strategy.ec.europa.eu/datasets/desi/charts

7 https://ec.europa.eu/newsroom/dae/redirection/document/98641

| | EU DESI 2023 | EU 2030 target |
|---|---|---|
| **1a1 Internet use** | **89%** | |
| % individuals | 2022 | |
| **1a2 At least basic digital skills** | **54%** | **80%** |
| % individuals | 2021 | |
| **1a3 Above basic digital skills** | **26%** | |
| % individuals | 2021 | |
| **1a4 At least basic digital content creation skills** | **66%** | |
| % individuals | 2021 | |
| **1a5 Enterprises providing ICT training** | **22%** | |
| % enterprises | 2022 | |
| **1b1 ICT specialists** | **4.6%** | **20 million** |
| % individuals in employment aged 15-74 | 2022 | ~10% |
| **1b2 ICT graduates** | **4.2%** | |
| % graduates | 2021 | |

**Figure 2: DESI 2023 digital skills indicators [8]**

EU has set its targets for the Digital skills and created a composite indicator to follow the progress over the years. The indicators are initially set in 2015 for measuring citizens' digital skills via DSI Digital Skills indicator - several modifications and updates on the methodology were made in 2019 and 2021, and the new DSI was introduced in 2022.

| Internet use | Individuals who use the internet at least once a week |
|---|---|
| At least basic digital skills | Individuals with 'basic' or 'above basic' digital skills in each of the following five dimensions: information, and data literacy, communication and collaboration, problem solving, digital content creation and safety |
| Above basic digital skills | Individuals with 'above basic' digital skills in each of the following five dimensions: information, and data literacy, communication and collaboration, problem solving, digital content creation and safety |
| At least basic digital content creation skills | Individuals with at a basic level of skills in using software for digital content creation |
| Enterprises providing ICT training | Enterprises who provided training in ICT to their personnel |
| Females having at least basic digital skills | Females with "basic" or "above basic" digital skills in each of the following five dimensions: information, communication, problem solving, software for content creation and safety |
| ICT specialists | Employed ICT specialists. Broad definition based on the ISCO–08 classification and including jobs like ICT service managers, ICT professionals, ICT installers. |
| ICT graduates | Persons with a degree in ICT |
| Female ICT specialists | Employed female ICT specialists. Broad definition based on the ISCO–08 classification and including jobs like ICT service managers, ICT professionals, ICT installers and servicers. |

8 DESI 2023 digital skills indicators grouped into two classes: 1a Basic and advanced skills; 1b Highly skilled digital workforce.

More generally, a large share of all Europeans (46% in 2021 according to Eurostat) still does not possess basic digital skills and are thus not confident when performing activities online and with digital devices, nor can they reap the full benefits of digital technologies. There is also evidence of low levels of digital skills among a significant share of young people, where it has been estimated that around one third of eighth graders are performing below a basic level of digital skills.

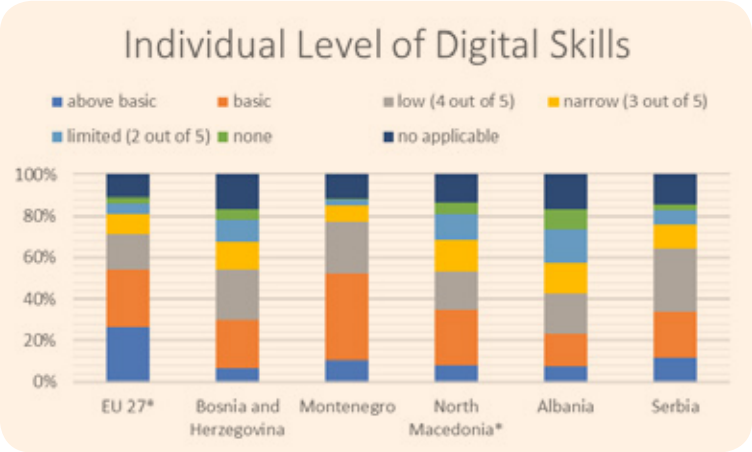


**Figure 3: EUROSTAT - Individual Level of Digital Skills 2023 (* data from 2021)[9]**

There is also a particular need to recruit more ICT specialists in Europe to fulfil the needs of industrial ecosystems (e.g., the automotive industry, aerospace, electronics.), which are increasingly relying heavily on cutting-edge technologies. To give one concrete example, around half a million [10] cybersecurity experts are currently needed in Europe.[11]

Several initiatives at national level are included in the digital components in EU Member States' national Recovery and Resilience Plans under the RRF. In fact, around 18% of the RRF expenditure contributing to digital objectives (EUR 23 billion) is dedicated to digital education and digital skills development. Furthermore, out of the EUR 117 billion expected to contribute to the Digital Decade targets, EUR 13.9 billion is considered relevant for at least basic digital skills and EUR 9.2 billion for ICT specialists.[12]

Furthermore, innovations and breakthroughs in different areas such as artificial intelligence (AI), robotics, quantum technology or 6G, are bringing a wave of demand for a new generation of advanced digital skills, such as skills in AI and machine learning algorithms, the Internet of Things, big data analytics, cloud computing or cybersecurity.

In addition to the significant shortage of ICT specialists, Europe also faces a significant digital skills gap in more traditional non-ICT professions.[13] For instance, there is a particularly high need to equip sector specialists with advanced digital skills, such as medical doctors who are increasingly relying on advanced digital technologies (e.g., AI and augmented reality) to provide more accurate diagnoses, or farmers who are using advanced data analysis to optimise their agricultural production processes. Furthermore, experts in the field of digitalisation of energy systems, connected mobility precision farming and hydro informatics, experts mastering the predictive and analytical capacities of AI for future weather forecasting or energy grid management or experts capable of the manipulation of big geospatial data for better resource utilisation.[14] In addition to the structural shortage of both ICT specialists the sector suffers from a severe gender imbalance in the EU with 81% of employed ICT specialists in 2022 being male[15], although women account for 51% of the European population.

9 https://ec.europa.eu/eurostat/databrowser/view/isoc_sk_dskl_i21/default/table?lang=en&category=isoc.isoc_sk.isoc_sku

10 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT_specialists_-_statistics_on_hard-to-fill_vacancies_in_enterprises

11 https://www.isc2.org//-/media/ISC2/Research/2021/ISC2-Cybersecurity-Workforce-Study-2021.ashx

12 Cosgrove, J., Tsotsou, I., Cachia, R., Centeno, C., Sala, A., Punie, Y., Thematic analysis in support of the Staff Working Document for Council Recommendations: Improving the provision of digital skills in education and training, and Digital education – enabling factors for success, JRC Science for Policy Report, 2023, available as Annex 3 to the Commission Staff Working Document SWD(2023) 205 final, https://education.ec.europa.eu/sites/default/files/2023-04/deap-swd-digital-skills-180423_en.pdf

13 https://www.bertelsmann-stiftung.de/fileadmin/files/user_upload/STUDIE_Burning_Glass_EN_FINAL.pdf

14 https://download.digitaldogme.dk/hubfs/Det%20digitale%20Kompetencebarometer%202020.pdf

15 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT_specialists_in_employment

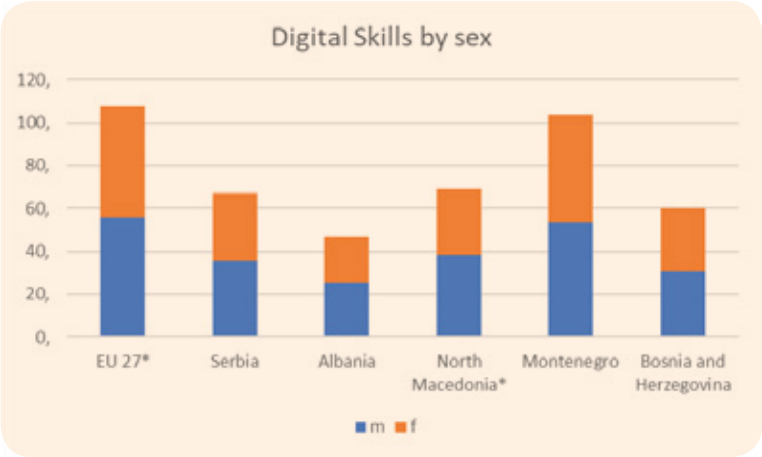


**Figure 4: EUROSTAT - Individual Level of Digital Skills by sex 2023 (* data from 2021)[16]**

The way that digital solutions are devised and deployed may be affected by the fact that only a small share of employed ICT specialists and ICT graduates are women. This gap does not fully recognise the value of women's contributions and talent which is essential for building a Digital Europe, and there is therefore a high need to increase the pool of talent in this field.

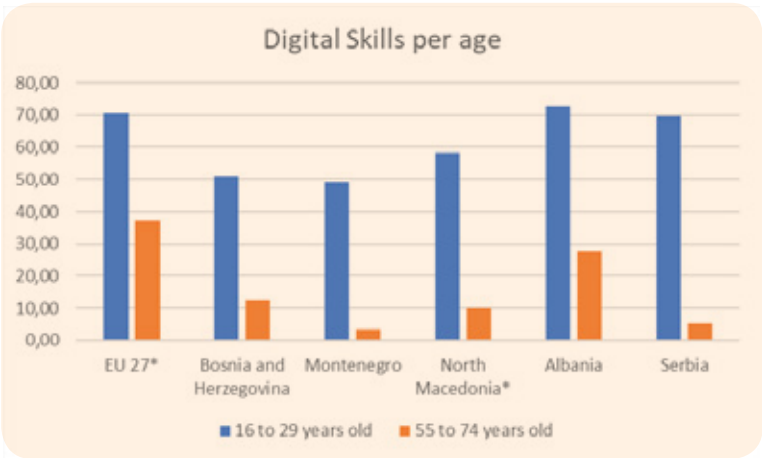


**Figure 5: Figure 3: EUROSTAT - Individual Level of Digital Skills by age 2023 (* data from 2021)[17]**

The analysis by age groups at the EU level shows that the digital skills gap is particularly important for older age groups.

Following the need to improve research and data collection process in the WB economies, the RCC (Regional Cooperation Council) has also prepared a study on the state of application of Digital Economy Society Index (but in the old methodology 2021/2022) in Western Balkans[18] including identification of data gaps and needs in each Western Balkan economy for 2021 and 2022.

Additional factor is in overall connectivity where WB region is lagging behind the EU, mainly due to 5G services which were not available in the WB region in 2021. Montenegro recorded the highest score in the Connectivity dimension, followed by Serbia, Kosovo* and Albania with scores above the WB average.

16 https://ec.europa.eu/eurostat/databrowser/view/tepsr_sp410/default/table?lang=en&category=t_isoc.t_isoc_sk

17 https://ec.europa.eu/eurostat/databrowser/view/isoc_sk_dskl_i21_custom_11843850/default/table?lang=en&page=time:2023

18 https://www.rcc.int/pubs/125/report-on-the-state-of-application-of-digital-economy-society-index-desi-in-western-balkan-economies

This is identified by EU and solution is proposed based on the WIFI4EU[19] project that is connecting people all over Europe (93.000+ hotspots in municipalities). As a good practice, EU is launching new EU4Digital project and funding mechanism to enlarge connectivity via hotspots in WB6 municipalities.

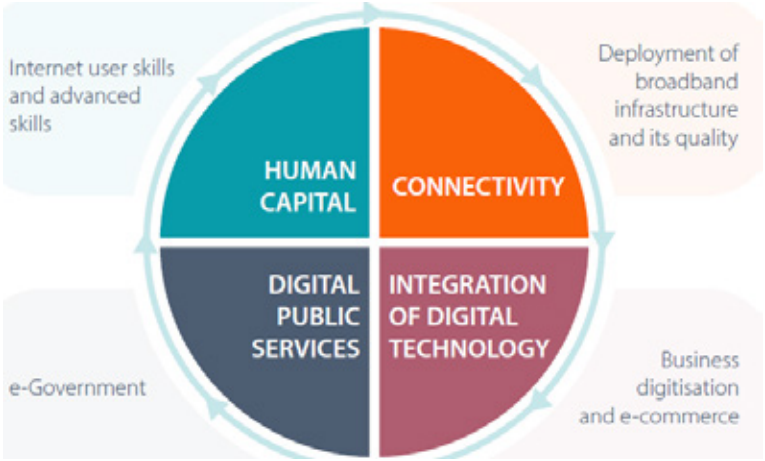


**Figure 6: RCC 2022 DESI dimensions**

In the Integration of digital technology dimension, the WB region underperformed compared to the EU. Policymakers in the WB region rapidly implement programmes and strategies that support digitalisation of business, including e-commerce. Montenegro recorded the best performance in the Integration of digital technology dimension, followed by Kosovo*, Albania and Serbia. The WB region has also strengthened its legal framework for the provision of digital services and the use of e-signatures. Positive developments were observed also in the increasing amount of available open data. Despite increased policy focus, the WB region performed notably below the EU in the Digital public services dimension. Serbia is the top performer in this segment, followed by Albania and North Macedonia.


**Figure 7: WB DESI 2022 by RCC**

19 https://digital-strategy.ec.europa.eu/en/activities/wifi4eu

Policymakers in the WB region have become increasingly focused on improving digital skills of citizens. When compared to the EU, the WB region reports good performance in the proportion of ICT graduates and female ICT specialists, Montenegro and Serbia have the highest scores in the Human capital dimension. While 85% of people in the WB region used the internet in the last 12 months in 2021, only 35% possessed at least basic digital skills.

## EUROPEAN DIGITAL SKILLS AND JOBS PLATFORM

To help address the skills gap in Europe, the "European Digital Skills and Jobs Platform"[20] was launched under the Connecting Europe Facility Programme. The Europass[21] is your free set of online tools to manage and test your skills, and plan your learning and career in Europe. Every EU citizen can create a free profile with Europass, of all skills, qualifications and experiences in one secure, online location. You can record and store everything in your personal Europass Library.

### EU DIGITAL COMPETENCE FRAMEWORK (DIGCOMP)[22]

First launched in 2013 the framework was updated 2022 to its current form, DigComp 2.2[23], integrated with 250 new examples of knowledge, skills and attitudes that help citizens engage confidently, critically and safely with digital technologies, and new and emerging ones such as systems driven by artificial intelligence (AI).

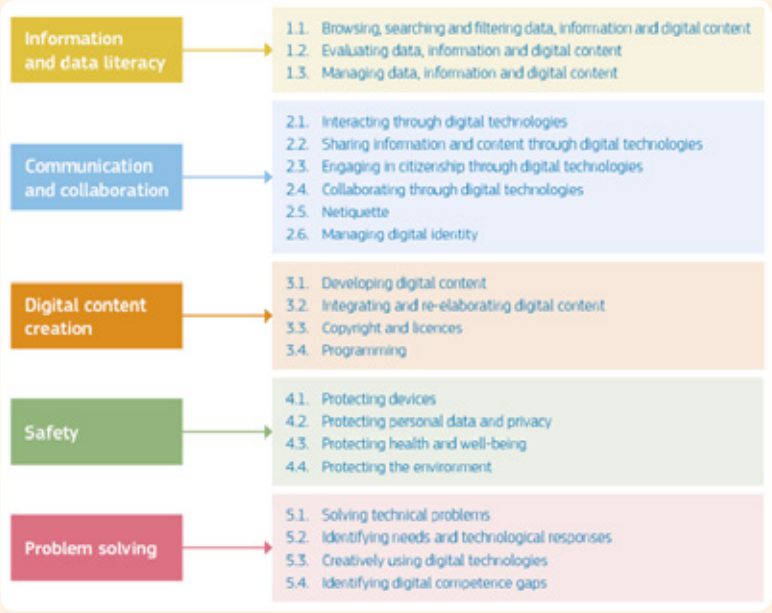


**Figure 8: key digital competences areas (DigComp reference model)[24]**

20 https://digital-skills-jobs.europa.eu/en/about/digital-skills-and-jobs-platform
21 https://europa.eu/europass/en
22 https://publications.jrc.ec.europa.eu/repository/handle/JRC128415
23 https://digital-skills-jobs.europa.eu/en/inspiration/research/digcomp-22-update-digital-competence-framework-citizens
24 https://publications.jrc.ec.europa.eu/repository/handle/JRC128415

## EU COUNTRY SPECIFIC COMPETENCE FRAMEWORK FOR DIGITAL SKILLS

**Austria** has developed within the fit4internet[25] initiative its own competence framework for digital skills based on the EU DigComp2.2. It is called "Digital Competence Framework for Austria - DigComp AT".

The DigComp AT 2.3 model describes 27 individual competences[26] in six competence areas – the EU DigComp was enlarged by one basis category:

1) Foundations, access and digital understanding
   a. Understanding the concepts of digitalisation
   b. Using digital devices and technologies
   c. Knowing, using, and providing inclusive forms of access to digital content
   d. Engaging with the digital world and developing the ability to make judgements

Within the six competence areas eight competence levels[27] were differentiated:

| 4 OVERALL LEVELS | Foundation | | Intermediate | | Advanced | | Highly specialised | |
|---|---|---|---|---|---|---|---|---|
| 8 GRANULAR LEVELS | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| COMPLEXITY OF TASKS | Simple task | Simple task | Well-defined and routine tasks, and straightforward problems | Tasks, and well-defined and non-routine problems | Different tasks and problems | Most appropriate tasks | Resolve complex problems with limited solutions | Resolve complex problems with many interacting factors |
| AUTONOMY | With guidance | Autonomy and with guidance when needed | On my own | Independent and according to my needs | Guiding others | Able to adapt to others in a complex context | Integrate to contribute to the professional practice and to guide others | Propose new ideas and processes to the field |
| COGNITIVE DOMAIN | Remembering | Remembering | Understanding | Understanding | Applying | Evaluating | Creating | Creating |

**Figure 9: EU digital skills - competence levels**

The "f4i-tools CHECK and QUIZ"[28] give you the opportunity to assess your digital competences by using self-assessment questions (CHECK) and knowledge-based questions (QUIZ). The DigComp 2.3 AT version is also the basis for all referenced courses and news or learning modules[29].

To measure Digital Skills, fit4Internet created also a "Digital Skills Barometer"[30], the first survey-based survey instrument in Austria and Europe, which provides a representative, well-founded picture of the digital knowledge of the Austrian population that goes beyond mere self-assessment.

25 https://www.fit4internet.at/page/home
26 https://www.fit4internet.at/media/overview_digcomp_2_3_at_en_pdf
27 https://www.fit4internet.at/media/digcomp_2_3_at_stufenverstndnis_en_final_pdf
28 https://www.fit4internet.at/page/assessment
29 https://www.adsb.gv.at/page/training-offer
30 https://www.fit4internet.at/view/verstehen-zahlendatenfakten/&lang=EN

## GOOD PRACTICE IN EUROPE

### AUSTRIA

Both the fit4internet Austrian DigComp 2.3 AT framework and the f4i-tools can be transferred very easily to WB6 and Moldova, as already confirmed via an EU TSI Project with Bavaria and North Rhine-Westphalia.[31] The same applies to the Austrian Digital Skills Barometer.

### FRANCE

Pix[32] is an online public service used to assess, develop, and certify digital skills in France, Belgium, and across Europe. Over the course of 6 years, PIX has helped +4,5 million students per year improve their digital skills through fun and challenging tests, but also teachers monitor digital literacy of students.

### GERMANY

The #DigitalCheckNRW[33] developed in North Rhine Westphalia is aimed at all people who want to know where they stand digitally and those interested in becoming more digitally competent. As soon as you have completed two of the six areas or a specialisation, you can create an official certificate of participation. It shows which areas and with what total number of points you have completed the #DigitalCheckNRW.

AI Campus[34] and eGov Campus[35]: free digital platforms with a selection of courses on AI and eGovernment with the objective to build networks between learners and educational experts. It has successfully built a nation-wide (and global) ecosystem of relevant players in the digital field

FINDING[36] is a platform in Schleswig-Holstein for the public sector with 250 online, face-to-face or hybrid courses.

### ITALY

Girls Code It Better[37] opens up a possibility to girls in secondary education to explore digital and entrepreneurship paths through extra-curricular courses, based on engaging and challenging training methods that guide them towards careers in ICT and STEM. Since its kick-off in 2014, the project has already set up 390 clubs, reaching more than 7.500 girls, 156 schools and 14 regions.

Open the Box[38] was launched in 2020 in the midst of the COVID–19 pandemic with the goal to build a scalable and effective media literacy project. It focuses on tackling online disinformation, and targets teachers and educators to enhance the digital skills of students between the ages of 11 and 18.

### PORTUGAL

Ubbu[39] is a computer science and programming platform that teaches kids, aged 6 to 12, how to code through game-based lessons. Kids learn to solve logical challenges and develop problem-solving skills while learn the Sustainable Development Goals.

31 https://reform-support.ec.europa.eu/what-we-do/skills-education-and-training/digital-upskilling-strategies-bavaria-and-north-rhine-westphalia_en

32 https://pix.fr/

33 https://www.digitalcheck.nrw/checkup/en/

34 https://ki-campus.org/

35 https://egov-campus.org/

36 https://findig.sh/

37 https://girlscodeitbetter.it/chi-siamo/

38 https://www.dataninja.it/en/portfolio/open-the-box-en/

39 https://ubbu.io/en-GB

## EU Policies, Initiatives, Fundings and local Strategies:

The European Commission has also considerably stepped up its efforts to boost digital skills over the last years through a number of initiatives:

- European Skills Agenda[40]
- Pact for Skills[41] with e.g. 106 organisations in Croatia or 107 in Slovenia
- Cybersecurity Skills Academy[42] - in the latest Eurobarometer on Cyber Skills (May 2024)[43], 45% of companies surveyed cited difficulty in finding qualified candidates as one of the main challenges in recruiting staff with the right cybersecurity skills. In addition, only 25% of companies have provided cybersecurity training or awareness raising to their employees in the past year.
- EU Code Week[44]

In line with all challenges described, many policy actions need to be put forward and pooled (both at EU level as well as EU candidate level) to achieve the EU digital skills targets.

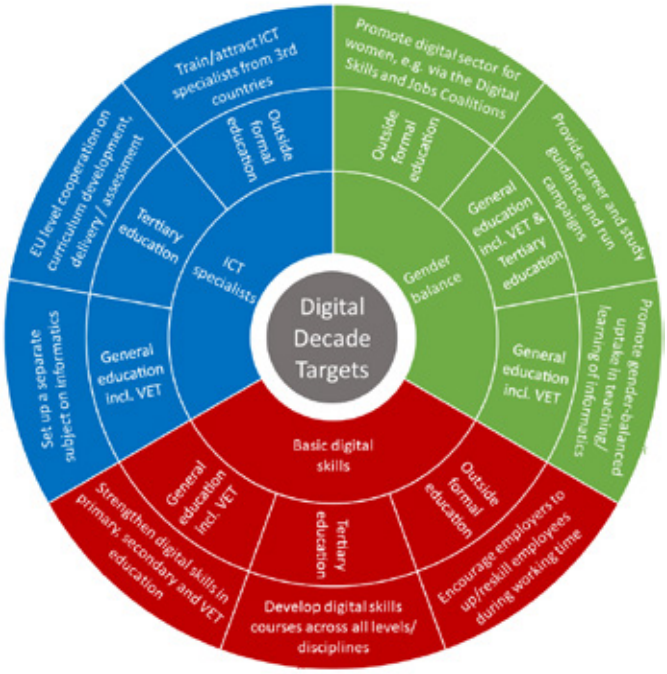


**Figure 10: Selection of Commission proposal for Council Recommendation**

There are many Digital Skills strategies – a small selection:

- Austria:
  https://www.digitalaustria.gv.at/Strategien/DKO-Digitale-Kompetenzoffensive.html
- Croatia:
  https://hrvatska2030.hr/

40 https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1196
41 https://pact-for-skills.ec.europa.eu/index_en
42 https://digital-skills-jobs.europa.eu/en/cybersecurity-skills-academy
43 https://europa.eu/eurobarometer/surveys/detail/3176
44 https://codeweek.eu/

- Slovenia:
  https://www.gov.si/assets/ministrstva/MGRT/Dokumenti/DIPT/StrategijaDTG.pdf
  https://www.gov.si/en/news/2022-01-06-the-government-of-the-republic-of-slovenia-adopts-the-strategy-for-the-digital-transformation-of-the-economy/
- Bulgaria:
  https://www.mtitc.government.bg/sites/default/files/uploads/it/09-12-2019_programa_-cifrova_bulgariya_2025.pdf

## Eurostat's "Digital Skills Indicator" (DSI)

Eurostat's "Digital Skills Indicator" (DSI) is a composite indicator consisting of selected activities of EU citizens in the area of internet and software use. It provides information on the basic digital skills of citizens in the EU Member States. The DSI was developed in cooperation with the Joint Research Centre (JRC) and the European Commission's Directorate-General for Communications Networks, Content and Technology (DG CNECT) and was first published in 2015. From 2019 to 2022, the DSI was extensively revised to modernise the indicator and align it with the revised EU DigComp 2.0. As part of "Europe's Digital Decade"[45], the European Commission has set a target that at least 80% of the European population should have basic digital skills. This target relates to the two highest competence levels of the overall DSI indicator - basic skills and above basic skills.

In 2021, only just over one quarter (26%) of the EU population aged 16–74 years reported above-basic overall digital skills. A higher share was recorded for people living in cities (33%), while a lower proportion of people living in towns and suburbs (24%) and in rural areas (20%) had above-basic overall digital skills.[46]

| Individuals with ... | above basic information and data literacy skills | | | |
|---|---|---|---|---|
| in year 2021 | all | in cities | in towns and suburbs | in rural areas |
| Romania | 48,42 | 61,56 | 47,15 | 37,96 |
| Albania | 49,05 | | | |
| Bulgaria | 50,7 | 61,51 | 48,47 | 38,05 |
| Bosnia and Herzegovina | 55,55 | | | |
| Turkey | 57,12 | | | |
| Italy | 58,4 | 61,15 | 57,74 | 54,92 |
| Germany | 59,82 | 64,33 | 57,16 | 56 |
| North Macedonia | 61,33 | 71,22 | 58,64 | 49,05 |
| Montenegro | 63,28 | | | |
| Serbia | 65,43 | | | |
| EU27 | 68,35 | 73,79 | 66,29 | 62,45 |
| Austria | 73,04 | 79,35 | 71,91 | 68,64 |
| Slovenia | 74,35 | 79,29 | 76,98 | 70,03 |
| Croatia | 76,12 | 83,92 | 78,96 | 70,06 |
| Norway | 94,98 | 96,63 | 95,12 | 93,2 |

| Individuals with ... | above basic information and data literacy skills | | | |
|---|---|---|---|---|
| in year 2023 | all | in cities | in towns and suburbs | in rural areas |
| North Macedonia | n/a | | | |
| Albania | n/a | | | |
| Germany | 53.50 | 57.67 | 50.94 | 49.72 |
| Romania | 54.05 | 64.17 | 53.75 | 45.96 |
| Bulgaria | 55.73 | 62.32 | 51.68 | 45.10 |
| Italy | 60.64 | 64.67 | 59.27 | 56.29 |
| Bosnia and Herzegovina | 62.47 | 67.19 | n/a | 59.00 |
| Turkey | 62.86 | | | |
| France | 67.08 | 73.17 | 64.70 | 62.03 |
| EU27 | 68.52 | 73.61 | 66.40 | 63.26 |
| Montenegro | 70.46 | | | |
| Serbia | 72.74 | | | |
| Austria | 74.94 | 78.39 | 76.49 | 70.81 |
| Slovenia | 75.34 | 82.01 | 75.09 | 72.67 |
| Croatia | 75.82 | 83.36 | 79.48 | 68.35 |
| Norway | 95.58 | 96.83 | 94.90 | 95.46 |

**Figure 11: Individuals' level of digital skills (Source: Eurostat)[47]**

45 https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

46 https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20230320-2

47 https://ec.europa.eu/eurostat/databrowser/view/ISOC_SK_DSKL_I21__custom_3532431/bookmark/table?lang=en&bookmarkId=43dca3eb-10d6-4eb7-9310-adb7c4e1fc2d

## European Training Foundation SWOT on the Countries of the Western Balkan

The report of the European Training Foundation[48] (ETF) published 2022 also prepared SWOT analysis (Strengths-Weaknesses-Opportunities-Threats) on the Western Balkan region and recommendations in Policy areas to make full use of the opportunities with the new forms of labor market, digitalized work and employment.

| STRENGTHS | WEAKNESS |
|---|---|
| · New employment opportunities<br>· Low entry barriers<br>· Highy paid international jobs<br>· On the job learning opportunities<br>· Flexible work arrangements | · Undeclared work and tax evasion<br>· Lack of worker social protection and labour rights<br>· Lack of inclusiveness/replication of inequalities existing in traditional labour markets<br>· Lack or insufficient access to activation and skills development and certification opportunities |
| **OPPORTUNITIES** | **THREATS** |
| · Reducing unemployment<br>· Proliferation of graduate level jobs<br>· Development of skills which are in demand in local labour markets<br>· Alternative to migration and brain drain | · Gaps in digital infrastructure and digital services<br>· Insufficient digital skills<br>· Insufficient occupational skills<br>· Lack of acknowledgement of the new forms of employment in regulation and policy |

**Figure 12: SWOT New forms of work in the Western Balkan from ETF report**

Following **recommendations** are very relevant to the local level government:

1. To further develop digital infrastructure and innovative services, an increasing need exists to look for synergies between the public policy efforts and the private sector initiatives (e.g. GovTech). Providing support for the private sector in digitalisation and development of the ICT sector, as well as exploring the possibilities of public-private partnerships in these areas, have the potential to help overcome the different ecosystem challenges (based on the conclusions of the National Report and Plan for Improving the Digital Agenda in **Montenegro**, prepared by the NGO 35mm[49] within the regional project 'Increasing civic engagement in the field of Digital Agenda' (ICEDA)[50])
2. Recognizing the job creation and economic growth potential of the ICT industry, as evidenced in **Serbia**, it's imperative for public policies to support investment (internal and foreign), in the sector and foster the development of ICT startups, generate high-quality jobs, mitigate emigration, and enhance skills development aligned with national and international market needs, thereby promoting digital education, including STEM education, especially among women, which remains underrepresented.
3. Various flexible training paths and formats, including Open Online Courses and informal learning opportunities online, can enhance the evolving labor markets and equip staff and workers, including platform workers, with contemporary skills. It can also be applied for the PA at all level of government, but some procedures for validating non-formal and informal learning are needed.
4. Good practice **Germany**: "digital coaches"

48 https://www.etf.europa.eu/sites/default/files/2023-04/Embracing%20digital%20age_Western%20Balkans.pdf

49 https://nvo35mm.me/

50 https://mjaft.org/sites/default/files/MJAFT_Country%20report%20presentation_EN.pdf

The KGSt[51] (Kommunale Gemeinschaftsstelle für Verwaltungsmanagement) described the role of "digital coaches" back in 2018.[52] This formed the basis for a large number of local authorities to establish this role in German administrations. Very different role models and profiles have emerged in the process. This is because there is only a limited "blueprint" for successful change processes. Much depends on the local starting position, the "customs" and the culture in the individual administrations. Digital pilots are people who deal with digital topics on their own initiative, out of their own commitment and enthusiasm. They do not have to be experts in everything digital from the outset, but should be motivated to seize the opportunities offered by digitalisation and make them available to every employee. It is not enough to appoint digital pilots and then hope for success. They must be supported, empowered and coordinated. But one thing is certain: the effort is worth it!

Task portfolio of digital pilots:[53]

The term digital pilot cannot be clearly categorised historically and is sometimes also referred to as digital coach, digital navigator, digital scout, etc.

51 Kommunale Gemeinschaftsstelle für Verwaltungsmanagement (KGSt) = Municipal Joint Centre for Public Administration Management in Germany is since 1949 a professional association for municipal management based in Cologne and jointly supported by cities, municipalities and districts. https://www.kgst.de

52 KGSt® B 8/2018: https://www.kgst.de/dokumentdetails?path=/documents/20181/1725501/8-B-2018_Digitale-Kommune-1.pdf/96b79576-1f00-5968-2b64-b19dddbf19ef

53 KGSt® Report No. 2018/8: Shaping the digital municipality, Part 1: Orientation framework and KGSt® role model

# DIGITAL COMPETENCE IN WESTERN BALKAN 6 AND MOLDOVA - DATA AND ACTIVITIES

In June 2018, the European Commission launched the Digital Agenda for the WB intending to support the digital transition of the region into a digital economy and bring the benefits of the digital transformation. The focus areas in the Digital Agenda include: investing in broadband connectivity; increasing cybersecurity, trust and digitalisation of industry; strengthening the digital economy and society; development of eGovernment, eProcurement, eHealth, and **digital skills**, boosting research and innovation.

However, the Digital Agenda cannot be complete if all levels of government and all stakeholders are not involved, familiar and engaged in its fulfilment. Local authorities in most Western Balkan economies have had no contact with this strategically important document, nor are they building their strategic documents and plans on that basis. Without coherence and multilevel governance coordination, a significant gap is created between expectations and achievements. Current status of local authorities that are left behind hinders the process on achieving the goals and targets set by central government but also the European targets.

In a situation, where central authorities and institutions lack IT professionals, but also with the high demand of IT skilled workers in EU, it is even more pronounced in public administration at the local level. The lack of professionals has not been measured systematically, according to digital skills and competence indicators, so far there is no data on local authorities. There are scattered national research but difficult to compare to draw a conclusion at local level.

The overall trend of brain drain impacting various sectors is evident, and significant numbers of ICT professionals are leaving the region. The search results indicate that the Western Balkan lack comprehensive and up-to-date data on brain drain and diasporas. The national statistical offices in the region have limited roles in producing data on brain drain and only registering official emigration. This lack of qualitative research on youth and brain drain is highlighted as a significant gap. The governments in the Western Balkans refer to data and analysis from international organizations, donors, and civil society for migration policies. In addition to brain drain from the region, some new forms of employment are also present. Online working platforms and international outsourcing is highly present in the region, with the freelance high-skilled workers engaged, primarily in the ICT sector and creative and multimedia industry. This trend can result in reducing the economic migration, but national policies are needed tackling skills polarization, and potential engagement of professionals in the national and local ICT ecosystems.

RCC has launched digital skills and competences study at PA on central and local level in all WB6 economies, but so far the results have not been published due to the scattered number of responses.

With this factsheet, we intend to address the need to strengthen the digital skills and competences of the local public administration ensuring active participation in digital transformation processes and approaching the targets of the Digital Agenda and National ICT strategies. Also, this factsheet aims to determine the current situation and then identify the potential to overcome the situation by presenting good and successful practices from other EU countries. To local government associations via the members of the NALAS Digitization Working Group same questions were shared to determine the current situation, but also the key institutions that exist and are aimed at improving the digital skills of public administration (at national but also local level).

According to the data obtained, the conditions vary and will be explained individually for each economy.

## ALBANIA

In total WB DESI 2022, Albania is a digital top performer, with DESI score above the WB average, especially in Integration of digital technology, Connectivity and Digital public services. Further improvements are necessary in the Human capital dimension.

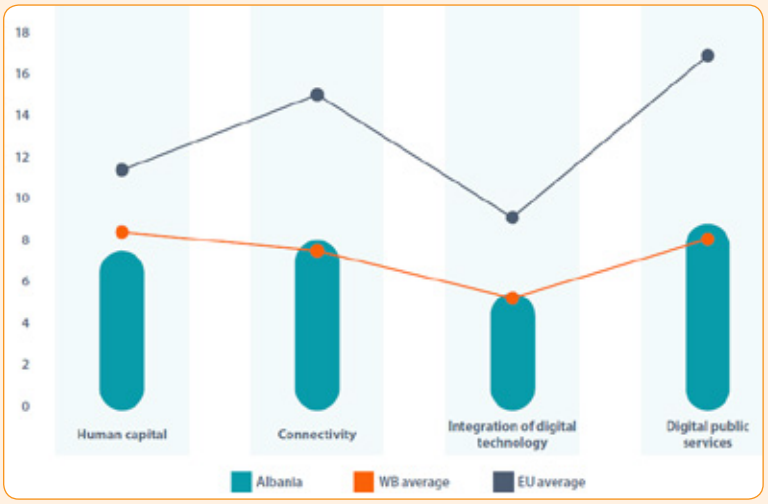


**Figure 13: WB DESI 2022 for Albania by RCC[54]**

One of the four pillars of Digital Agenda for Albania 2022–2026[55] is related to digital education and digital skills and transforming learning and teaching, with the main objectives which, among others, include development of digital skills and human talent to support digitalisation in Albania. there are several initiatives to boost digital skills in younger generation and women, such as Techspace- technology lab available to young people, Pyramid Multifunctional Centre that includes digital skills learning for high school students (TUMO)[56] and pilot training programme (develop digital skills) to support Albanian women to access online work opportunities.[57] The National Strategy[58] also includes the digital skills and topics of PA reform.

**Digital skills and competences of Public Administration at the local level in Albania are not measured and there are no mandatory tests in the recruitment process. For the ICT specialists, there is a testing procedure according to the job description provided by the National Agency for Information Society (AKSHI)[59] and upon their recruitment from this organization.**

Each local government independently conducts the hiring procedures for its employees. ICT specialists hired by local governments may possibly undergo testing by the respective local government authorities. For other positions at local government mandatory testing for digital skills is not required. Some individual examples were pointed out, such as the Municipality of Shkodra[60] in Northern Albania that outlines knowledge requirements to

54 https://www.rcc.int/pubs/159/western-balkans-digital-economy-society-index-wb-desi-2022-report

55 https://akshi.gov.al/wp-content/uploads/2022/06/vendim-2022-06-01-370.pdf

56 https://tirana.tumo.al/

57 https://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Publications/Digital%20Development%20Country%20Profiles/Final- Albania-Digital-Skills-Assessment.pdf

58 https://konsultimipublik.gov.al/Konsultime/Detaje/414

59 https://akshi.gov.al/

60 Municipality of Shkodra Job Vacancy: https://bashkiashkoder.gov.al/mundesi_punesimi/shpallje-per-levizje-paralele-dhe-pranim-ne-sherbimin-civil-ne-kategorine-ekzekutive-5/

be tested for an ICT specialist in its job vacancy announcement, such as laws related to personal data protection, electronic documents, electronic government, and guidelines for standardizing procedures for purchasing technological goods and services for public administration.

Some cases show that non-IT staff in local government administration is tested for digital skills only if they undergo training program, with certification exams conducted at the end of the training.

The Albanian School of Public Administration (ASPA)[61] is a major public institution responsible for training PA from both central and local governments. ASPA offers various training programs and operates under the Law on Civil Servants and the Decision of the Council of Ministers no. 138, dated 12.04.2014.

There are two agencies in Albania responsible for testing and training of PA, including the local PA: ASPA and AKSHI. However, there is no mandatory testing or training for PA at local or central level. On the question of legally established way for PA training for IT, through universities, or licensed IT training companies, there is no specific answer, the same as with the relevance of political will from leaders for upgrading competences in different institutions.

Additionally, a Local Government Academy is set to be established by early 2024, aimed at training local government officials in various areas, including urban planning, legislation, procurement, and territory control.

National Authority on Electronic Certification and Cyber Security (AKCESK)[62] is responsible for cybersecurity in Albania. The General Director of AKCESK serves as a master trainer at ASPA, through which cybersecurity training for public administration is conducted. Local Government Association is aware that AKCESK provides training for PA on the topics of risks and security.

The DESI indicators[63] are monitored by three institutions:

- Institute of Statistics (INSTAT)[64],
- Electronic and Postal Communications Authority of Albania (AKEP)[65],
- National Agency for Information Society (NAIS/AKSHI).

61 https://aspa.gov.al/en/

62 https://cesk.gov.al/en/about-us/.

63 According to the Annex 1 of the "Report on the State of Application of Digital Economy Society Index in Western Balkan Economies", in 2020 EU commission approved the action plan for the digital agenda; finalise and adopt the national cybersecurity strategy; and draft a digital skills strategy. The Commission also noted that Albania needs to improve the collection of statistical data on digital performance and digital competitiveness to monitor the progress on electronic communications and information society.

64 https://www.instat.gov.al/en/Home.aspx

65 https://akep.al/en/

## BOSNIA AND HERZEGOVINA

In total WB DESI 2022, Bosnia and Herzegovina performs below the WB average.

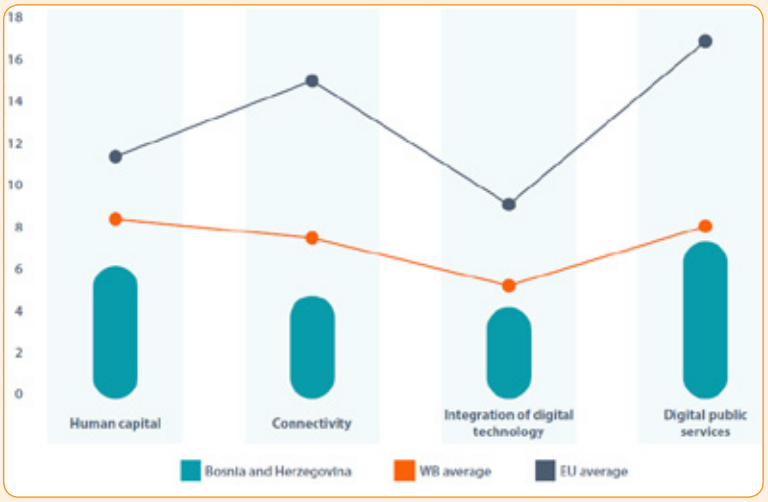


**Figure 14: WB DESI 2022 for Bosnia and Herzegovina by RCC[66]**

In Human capital dimension, Bosnia and Herzegovina is performing well in several very important digital skills indicators, such as individuals with at least basic digital skills and digital content creation skills with scores on the WB average or above the average. The lack of qualified professionals is perceived as the significant challenge for the ICT sector in Bosnia and Herzegovina. 69% of enterprises in Bosnia and Herzegovina that are looking for ICT specialists reported hard-to-fill vacancies[67].

There is a strategy[68] for the development of science and technology, higher education and the information society in the Republic of Srpska for the period 2023–2029 and a CERT establishment strategy[69] as well as for public administration trainings the agency for civil service (ADS)[70].

**No specific data on Digital Skills at local level were identified.**

Interesting part on competences for recruitment of public administration is identified in the area of Innovation, described in the Guidebook for competences in recruitment of civil servants published 2015. [71]

66 https://www.rcc.int/pubs/159/western-balkans-digital-economy-society-index-wb-desi-2022-report

67 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT_specialists_-_statistics_on_hard-to-fill_vacancies_in_enterprises

68 https://vladars.rs/sr-SP-Cyrl/Vlada/Ministarstva/mnk/OM/Resori/ntr/Documents/MNV%2c strategija 23 - 29.pdf

69 https://www.msb.gov.ba/dokumenti/strateski/default.aspx?id=%206248&langTag=bs-BA

70 https://www.adsfbih.gov.ba/ and http://www.ads.gov.ba/

71 https://parco.gov.ba/wp-content/uploads/2016/07/Priru%C4%8Dnik-za-upravljanje-procesom-zaposljavanja-B.pdf

## KOSOVO

In total WB DESI 2022, Kosovo* is performing below the WB average, mainly due to low scores in Human Capital and Digital public services dimensions. Considering WB DESI 2022 dimensions, Kosovo* has good performance in Connectivity and Integration of digital technology dimensions with scores above the WB averages. Further improvements are needed in Human capital and Digital public services dimensions.

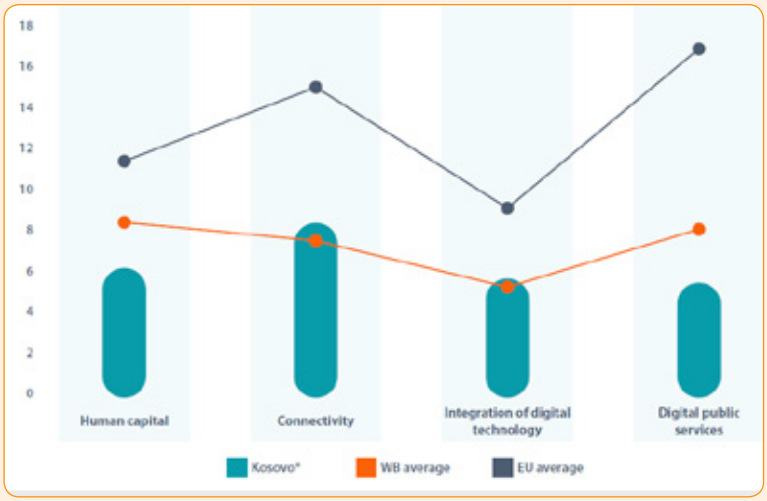


**Figure 15: WB DESI 2022 for Kosovo by RCC[72]**

With the support of ALLED2 (Aligning Education for Employment)[73] project and Kosovo* Chamber of Commerce, a set of three statistical barometers was launched in 2021 to strengthen the skills agenda and establish a framework approach to skills intelligence. The Skills Barometer[74] is a report on Kosovo*'s current and future skills needs. The five-year forecast into the skills and occupations demanded by different sectors and economic activities offers an important tool for evidence-based policy making in education, training and SME policy, particularly in terms of VET planning and identifying priority sectors across specific regions. The Skills Barometer currently addresses only the demand side because supply-side information on those leaving education and training institutions is unavailable, highlighting the ongoing challenge of data availability.

Currently, Ministry of Economy is implementing two projects that support young people for ICT and soft skills training:

- IPA 2017 Project EU Support for the competitiveness of Kosovo's* ICT Sector offers specialised ICT training. A specific webpage is dedicated to informing all interested young people about training. The target is to train at least 1440 beneficiaries and 90 participants for business trainings.[75]
- KODE – Youth Online and Upward Programme supported by the World Bank[76]. It aims to train at least 2,000 unemployed or under-employed young people in the most in-demand digital and soft skills in 5 to 6 months of physical training sessions delivered in 7 regions of Kosovo*.[77]

**No specific data on Digital Skills at local level were identified.**

72 https://www.rcc.int/pubs/159/western-balkans-digital-economy-society-index-wb-desi-2022-report

73 https://alled.eu/en/project/

74 http://alled.eu/wp-content/uploads/2022/02/Kosovo-Skill-Barometer-1.pdf

75 https://neighbourhood-enlargement.ec.europa.eu/system/files/2017-12/ipa_2017_040506.08_ks_eu_support_for_the_competitiveness_of_kosovos_ict_sector.pdf

76 https://www.rit.edu/kosovo/kode

77 https://kodeproject.org/en/digita-work-and-empowerment/

## MOLDOVA

The country has 18 higher educational institutions that offer IT-related studies or services. Nonetheless, the teaching methods are often focused on theory rather than practical implementation. According to a study by the World Bank, "ICT professionals complained that teaching materials were too theoretical during the first two years of university. They criticized the curriculum and courses as not being related to the ICT profession, that there was a lack of optional courses, that the laboratories were usually outdated, poorly equipped and with bad Internet connections, and that teachers lacked practical experience and were usually not well trained."[78]

Among the drawbacks is the fact that Moldova's policy restrictions limit the potential for improved industry-academia collaboration. This could be improved like "Teach for Austria week"[79] where top managers teach in schools.

**Relative to GDP, Republic of Moldova is performing above expectations for its level of development. The Digital Transformation Strategy[80] and the E-Governance Agency[81] also provides some test for digital skills and competences of Public Administration. The training center for IT for public administration (PA) is within the State University.[82]**

The DESI indicators are monitored by two institutions:

- E-Governance Agency
- Information Technology and Cyber Security Service[83]

Local level development is not measured, but positive examples are visible at urban as well as rural municipalities, such as the Municipality Strășeni[84].

78 https://moldova.un.org/sites/default/files/2022-02/Digital%20Development%20Country%20Profile_Moldova_06.12.21.pdf
79 https://www.teachforaustria.at/story/fuehrungskraefte-im-unterricht/
80 https://www.egov.md/sites/default/files/document/attachments/strategia_de_transformare_digitala_2023-2030.pdf
81 https://egov.md/en
82 https://iap.gov.md/
83 https://stisc.gov.md/en
84 https://www.straseni.md/

## MONTENEGRO

In total WB DESI 2022, Montenegro has the highest total DESI score in the WB region. Improvements are needed in Digital public services dimension.

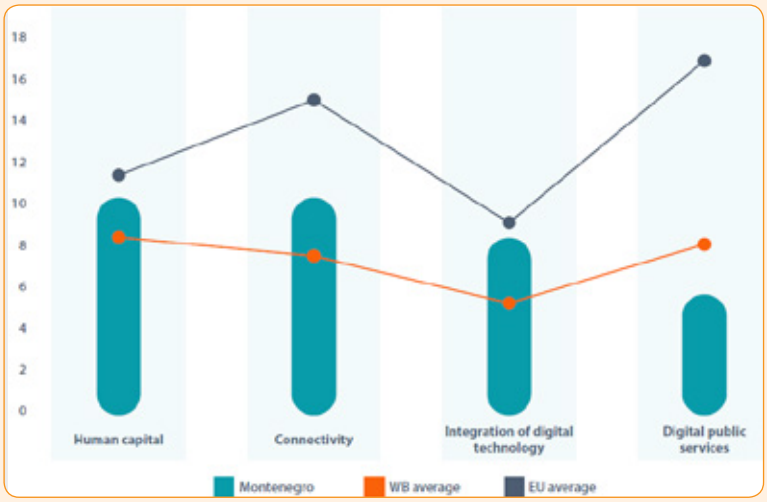


**Figure 16: WB DESI 2022 for Montenegro by RCC[85]**

Montenegro performs very well in overall digital skills. The number of individuals with at least basic digital skills and individuals with at least basic digital content creation skills is notably higher compared to the WB averages.

**The Strategy for Development of Vocational Education in Montenegro in the period 2020–2024 (VET Strategy)[86] recognizes the importance of digital skills. One of the main objectives of Digital Transformation Strategy of Montenegro for the period 2022–2026[87] is strengthening digital skills and development of ICT professionals to enable digital transformation.**

The work of the Digital Academy[88] (Ministry of Public Administration) is supported by ReSPA through its support instruments, by hiring experts who implement trainings. Everyone can follow these trainings, there are no restrictions because there is a public invitation to participants and there is a live stream.

The Agency for Cyber Security[89] will be established with the adoption of the new Law on Information Security (Cyber Security Strategy of Montenegro 2022–2026[90]). The trainings are organized by MJU and WB3C (Regional WB Cyber Capacity Center)[91].

The DESI indicators are monitored by four institutions:

- Agency for Electronic Communications and Postal Activity (EKIP)[92]
- Ministry of Public Administration (MJU)[93]
- Ministry of Economy (MEK)[94]
- Statistical Office of Montenegro (MONSTAT)[95]

85 https://www.rcc.int/pubs/159/western-balkans-digital-economy-society-index-wb-desi-2022-report
86 https://www.gov.me/dokumenta/3f8ece83-b549-4c84-8ae9-a8620ff67928
87 https://www.gov.me/en/documents/59dcab9b-b0e8-48b7-830b-6e4eab690521
88 https://www.gov.me/mju/digitalna-akademija
89 https://www.gov.me/clanak/agencija-za-sajber-bezbednost-uskoro-u-nekadasnjim-prostorijama-respa-e
90 https://www.gov.me/dokumenta/85e2a9d0-0d3c-483a-9822-515d3b7798de
91 https://me.ambafrance.org/Western-Balkans-Cyber-Capacity-Center-WB3C
92 https://ekip.me/
93 https://www.gov.me/en/mju
94 https://www.gov.me/en/mek
95 https://www.monstat.org/eng/

## NORTH MACEDONIA

In total WB DESI 2022, North Macedonia is performing below the WB average due to lower scores in the Human capital, Connectivity and Integration of digital technology dimensions. Considering WB DESI 2022 dimensions, North Macedonia has good performance in Digital public services dimension with the score above the WB average. Improvements are mainly needed in the Integration of digital technology dimension.

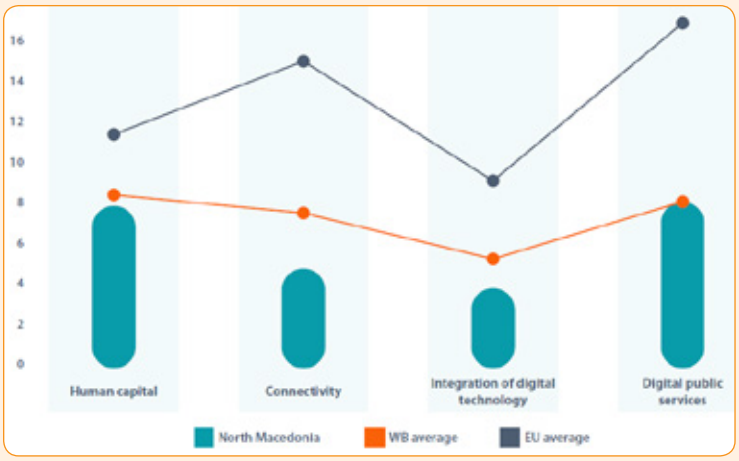


**Figure 17: WB DESI 2022 for North Macedonia by RCC[96]**

In 2020 ICT graduates accounted for almost 6% of all graduates in North Macedonia, down from 7% in 2019, but still above the EU average of 4%. The proportion of ICT specialists is close to the WB average, while the number of female ICT specialists in total employment (23%) is above the WB and EU average of 19%. North Macedonia Progress Report for 2022 entails development and adoption of digital skills strategy and a reference framework for digital literacy throughout the society, since improving digital literacy is a priority to ensure digital transformation through a cross-cutting approach.[97]

Digital literacy and ICT in schools is incorporated as a topic in the Education Strategy 2018–2025 and the Action Plan.[98] The Strategy defines ICT and digital literacy as one of the five general topics related to the overall education system and specifies it as a priority to ensure widespread use of ICT in education and training and digital literacy.

Among peers in the region, North Macedonia has one of the highest numbers of recommended hours for ICT as a compulsory, separate subject in primary education (around 150 hours), and digital competence is addressed as a compulsory separate subject. North Macedonia is also one of nine countries in which provision of continuing professional development in digital education is mandatory. Substantive efforts have been undertaken by the government in order to strengthen the digital skills development of youth. For example, almost all higher education institutions and universities in the country offer an ICT curriculum. The government of North Macedonia also offered an online Digital Skills Training for teachers in primary and secondary schools for ICT in teaching process, a course which remains ongoing and offers the opportunity to develop skills for using different platforms like Plickers, Kahoot and Mentimeter as well as how to create video content. Moreover, MoES delivers video tutorials for educators to better equip them to use the Moodle and Teams platforms during teaching process.[99]

There is a training center in the MIOA Academy[100] for professional training of administrative officers. Currently there is a cyber hygiene training.[101] open for the local government officials.

96 https://www.rcc.int/pubs/159/western-balkans-digital-economy-society-index-wb-desi-2022-report

97 https://neighbourhood-enlargement.ec.europa.eu/north-macedonia-report-2022_en

98 https://planipolis.iiep.unesco.org/sites/default/files/ressources/macedonia-education-strategy-for-2018-2025-and-action-plan-strategija-za-obrazovanie-eng-web-1.pdf

99 https://northmacedonia.un.org/sites/default/files/2021-11/Digital%20Development%20Country%20Profile_North%20Macedonia_%2029.10.21.pdf

100 https://e-obuki.mioa.gov.mk/

101 https://www.mioa.gov.mk/mk-MK/news/pokana-za-ucestvo-na-besplatna-online-osnovna-obuka-za-administrativni-sluzbenici-na-tema-sajber- hygiene-4488.nspx

## SERBIA

Serbia is a digital top performer in the WB region, with the total WB DESI 2022 score above the WB average.

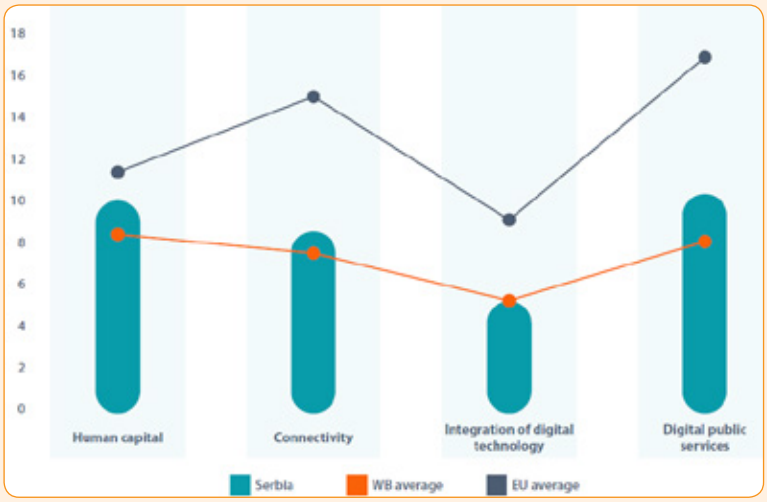


**Figure 18: WB DESI 2022 for Serbia by RCC[102]**

Serbia is one of the best performing WB economies in the Human capital dimension. It is placed at the top among WB economies when it comes to individuals with basic and above basic digital skills. Also, Serbia has the highest share of its population with at least basic digital content creation skills (64% compared to the WB average of 54%). With regards to the number of ICT graduates, Serbia performs markedly better than the EU average and has seen 15% growth in this area over the last two years.

Basic digital competencies, programming, and computer problem solving have become an integral part of the curriculum in schools at all levels of education. In addition, the Strategy for the Development of Digital Skills (2020–2024) aims to develop digital skills within the population necessary for everyday life, develop a successful career in the sector, and improve the knowledge and skills of ICT professionals.[103]

The strategy of public administration reform in the Republic of Serbia 2021 – 2030[104] addresses the management of human resources which is based on competences (and therefore includes digital competences), as well as Program for the reform of the local self-government system 2021 – 2025.[105]

The National Academy of Public Administration (NAPA)[106] is the central institution of the professional training system in the public administration of the Republic of Serbia, with the status of a publicly recognized organizer of non-formal adult education activities. The work of the National Academy for Public Administration is supervised by the Ministry of State Administration and Local Self-Government.[107]

102 https://www.rcc.int/pubs/159/western-balkans-digital-economy-society-index-wb-desi-2022-report

103 https://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Publications/2022/Digital%20Innovation%20Profile%20Republic%20of%20Serbia.pdf

104 https://mduls.gov.rs/propisi/strategije/?script=lat

105 https://mduls.gov.rs/obavestenja/program-za-reformu-sistema-lokalne-samouprave-u-republici-srbiji-za-period-od-2021-do-2025 -years/?script=lat

106 https://napa.gov.rs/

107 https://mduls.gov.rs/en/home/

# Findings and Recommendations

## FINDINGS

1. Digital Agenda cannot be complete if all levels of government and all stakeholders are not involved, familiar and engaged in its fulfilment. Local authorities in most Western Balkan economies have had no contact with this strategically important document, nor are they building their strategic documents and plans on that basis. Without coherence and multilevel governance coordination, a significant gap is created between expectations and achievements. Current status of local authorities that are left behind hinders the process on achieving the goals and targets set by central government but also the European targets.
2. Brain drain poses a critical challenge across all sectors, particularly in recruiting IT professionals for public administration. This deficiency in skilled personnel hampers the digitalization of local governance.
3. Public administrations face significant challenges in attracting and retaining ICT-qualified staff. Current data shows no comprehensive measurement of digital skill levels within local administrations, and the identification of required skills rarely includes ICT-related competencies. While the RCC has made efforts to identify ICT skills in local public administration, low response rates have limited the usability of these findings.
4. The lack of platforms to facilitate digital education and skills development among local government staff exacerbates this issue. This gap not only hinders the upskilling of personnel but also impedes municipalities from leveraging digital tools and technologies to improve citizen services, participatory governance, and data protection. *To bridge these gaps, local governments must prioritize capacity building, adopt standardized assessments, and integrate collaborative practices with academia, busin esses, and civil society.*
5. Moldova stands out for its integration of academia into public administration training for digital skills, though the extent of its impact in rural areas remains unclear. EU examples of local government-led education initiatives offer replicable models for municipalities in the NALAS region.
6. Indicators like the DESI (Digital Economy and Society Index) and the EUROSTAT Digital Skills Indicator focus solely on national levels, neglecting local disparities. This oversight makes it difficult to address gaps in digital skills and competences at the local level, including the urban-rural divide, gender disparities, and digital exclusion of the elderly population (gray exclusion). Among the Western Balkan Six (WB6), there is substantial variation in progress toward DESI targets, further emphasizing the need for localized assessments.
7. Overall digital skills presented by EUROSTAT and Digital Skills Indicator DSI are indicating demand for advancing digital skills, specifically considering entering emerging technologies in everyday lives. Main threat in the report from European Training foundation also considered insufficient digital skills. Divide between rural areas, towns and cities is monitored for the EU countries, but only one out of 6 Western Balkan economies provided such specific data, and Kosovo is not included in the EUROSTAT.
8. EU good practices, such as self-assessment tools for measuring digital skills, offer valuable inspiration for the region. However, no such standardized tools exist within the WB6 or Moldova, representing a key opportunity for development.
9. Cybersecurity is an emerging priority, yet local governments often underestimate its importance. Awareness, legislative understanding, and skills in data protection are limited, leaving administrations vulnerable to cyber threats and data breaches.
10. The absence of local labor market analyses further prevents municipalities from proposing targeted upskilling programs for educators or updating school curricula to meet evolving needs.

## RECOMMENDATIONS

### Digital Skills Targets Alignment

The EU's Digital Compass targets and national targets for digital skills in the Western Balkans and Moldova must be communicated clearly to local governments. NALAS is dedicated to awareness raising thru the Digitalization Working group and support stronger coordination for multilevel governance. This will ensure that local governments engage with aligned, synchronized, and coherent actions that contribute to achieving these targets and include all target groups: public administration, citizens (all age groups, in all areas urban/rural) thus ensuring digital inclusion.

### Conducting dedicated research by Applying DESI Indicators at the Local Level

To bridge gaps in digital skills and infrastructure, the DESI (Digital Economy and Society Index) indicators should be adapted for local-level application in the Western Balkans and Moldova. This would enable targeted identification and measurement of digital skills, ICT professionals, and specialists in local context. Localizing the DESI framework can uncover disparities, including the urban-rural divide and other socio-economic factors, while offering evidence-based insights for policy-making and strategy development. This discussion is also active on EU level and NALAS thru CEMR is following the development sharing the positions to NALAS working group and NALAS members.

### Apply EU good practices in digital competence identification

The EU Digital Competence Framework (DIGCOMP) framework, with its comprehensive catalog of digital competencies, offers a ready-made model for adoption in the Western Balkans and Moldova. It includes 250 examples of knowledge, skills, and attitudes essential for engaging with current and emerging digital technologies such as AI. The framework requires localization for the Western Balkans and Moldova, including translation into local languages and tailored data collection methods. NALAS with its Working group can further advocate for its adoption and promote awareness among Local Government Associations (LGAs), with support from EU institutions for local implementation. Close cooperation with ReSPA and RCC in adopting EU measures shall contribute and accelerate this initiative.

### Develop and Localize Self-Assessment Tools

EU examples of digital self-assessment tools provide a foundation for measuring individual digital competencies. EU examples of digital self-assessment tools for skills at local/city level are also available and open for use, e.g. LORDIMAS[108]. These tools should be localized into the languages of the Western Balkans and Moldova and accompanied by awareness campaigns targeting citizens, educators, and local government officials. Standardized assessments, developed in collaboration between NALAS, RCC and ReSPA, could provide an evidence base for coherent and inclusive support across all levels of government.

### Promote Recognition of Qualifications and Certification

Introducing mechanisms for recognizing digital qualifications and certifications between the EU, Western Balkans and Moldova, would motivate skill upgrades and foster integration into the digital ecosystem and regional job market. Localizing the Europass framework for all local languages in the Western Balkans and Moldova is also recommended, with involvement and in collaboration between ReSPA, RCC, and NALAS.

108 LORDIMAS by EC CoR,) as a unified instrument for assessment of digital maturity of the city or local government and access best practices examples.https://gis-portal.espon.eu/arcgis/apps/experiencebuilder/experience/?id=975e0dd3bcf84aa9810f0f5b5f7b9b65

### Address brain drain, but also leverage outsourcing potential

Beyond the ongoing brain rain and loss of skilled professionals, many IT experts remain in their municipalities but work for foreign companies as outsources workforce. These professionals are disconnected from the local digital ecosystem, leaving their expertise untapped in the digital transformation process. To strengthen the digital economy, governments at all level should create mechanisms that engage these professionals in national and local initiatives. Plans are recommended to encourage their participation in knowledge-sharing networks, mentoring programs, and innovation projects that benefit both public and private sectors. Structured collaboration—through advisory councils, innovation hubs, and flexible taxation—can incentivizing them to contribute for local development.

### Empower Local Authorities Digital skills through Capacity Building

Empowering local governments through education and capacity building is central to NALAS' mission. Collaboration with RCC, ReSPA, academia, the private sector, and Digital Innovation Hubs (DIHs) should be leveraged to accelerate digital transformation. Joint efforts can deliver unified training curriculum programs, deploy digital education platforms, and foster a digitally literate government across all levels.

### Strengthen Collaboration and Establish Working Groups

Creating cross-level working groups with representatives from national and local governments is critical for knowledge exchange and capacity building. NALAS' existing Digitalization Working Group serves as a model for promoting best practices between NALAS members. Collaborating with ReSPA to enhance public administration skills at all government levels, and advocating for the inclusion of local public officers in ICT training programs, will ensure a coordinated approach to capacity development.

### Involve Local Governments in Strategy Development

The active participation of local governments in the formulation of national ICT strategies and legislation for Digital skills is essential. NALAS is dedicated to support its member associations in advocating for inclusive approaches that reflect the needs of municipalities thus fulfilling its mission in strengthening multilevel governance.

### Leverage EU Good Practices

EU education practices at the local level offer replicable models for the WB6. Municipalities should adopt both formal and informal learning opportunities to enhance digital skills and foster innovation.

### Expand E-Learning and Digital Skill Platforms

NALAS' e-learning platform can serve as a hub for digital education, offering access to resources that facilitate upskilling for local government administrations. By fully utilizing this platform, municipalities can adopt advanced digital tools and technologies, enabling more effective governance and service delivery.

# Bibliography
## (further reading list)


Beile J, Rieke C, Schöneberg K, Gabriel S (2019) FührDiV – Führung in der digitalisierten öffentlichen Verwaltung: Ein Handlungsleitfaden. Initiative Neue Qualität der Arbeit. https://fuehrdiv.org/files/cto_layout/fuehrdiv/Handlungsleitfaden/Fu%CC%88hrDiV_Handlungsleitfaden_191119.pdf

Bundesinstituts für Bau-, Stadt- und Raumforschung (BBSR) im Bundesamt für Bauwesen: Datenkompetenz in kommunalen Verwaltungen, Bedarfsanalyse und Referenzrahmen für strategisches Handeln (2023), https://publica.fraunhofer.de/entities/publication/a21c1c50-3eec-48db-9056-1176757d9a51/details

Datenstrategien in Kommunen - Handlungsempfehlungen zur praktischen Umsetzung (2023), https://www.bbsr.bund.de/BBSR/DE/veroeffentlichungen/sonderveroeffentlichungen/2023/datenstrategien-kommunen.html

Halsbenning S, Niemann M, Becker J (2021): Rettung der Verwaltungsdigitalisierung mittels Bildungsplattform? Wirtschaftsinformatik und Management, Volume 13 (174–183). https://doi.org/10.1365/s35764-021-00338-7

Hartzog W (2024): Two AI Truths and a Lie, Yale Journal of Law & Technology, Volume 26, Special Issue https://scholarship.law.bu.edu/context/faculty_scholarship/article/4800/viewcontent/Two_AI_Truths_and_a_Lie.pdf

Hill H (2021): Leadership in der digitalen Moderne. VM Verwaltung und Management, Jahrgang 27, Heft 6: 251–257. https://doi.org/10.5771/0947-9856-2021-6-251

Kusanke K., Kendziorra J., Pilgenröder S., Winkler T.J. (2024): Maßnahmen für den Aufbau von Digital Leadership - Kompetenzen für Führungskräfte im öffentlichen Sektor, HMD Praxis der Wirtschaftsinformatik (202–219), https://doi.org/10.1365/s40702-023-01026-3

Lang J (2020): Digital Leadership voranbringen. Fachzeitschrift Innovative Verwaltung, Ausgabe 10/2020, Springer Fachmedien Wiesbaden. https://doi.org/10.1007/s35114-020-0278-0

Mergel I (2020) Kompetenzen für die digitale Transformation der Verwaltung, Fachzeitschrift Innovative Verwaltung, Ausgabe 4/2020, Springer Fachmedien Wiesbaden. https://doi.org/10.1007/s35114-020-0209-0

Mergel I (2021): Digital Transformation of the German State, in: Public Administration in Germany, S. 331–355, https://link.springer.com/chapter/10.1007/978-3-030-53697-8_19 .

Mergel I, Brahimi S, Hecht S (2021): Agile Kompetenzen für die Digitalisierung der Verwaltung, Fachzeitschrift Innovative Verwaltung, Ausgabe 10/2021, Springer Fachmedien Wiesbaden. https://doi.org/10.1007/s35114-021-0705-x

Office of Technology and Division of Privacy and Identity Protection: AI (and Other)

Companies: Quietly Changing Your Terms of Service Could be Unfair or Deceptive, https://www.ftc.gov/policy/advocacy-research/tech-at-ftc/2024/02/ai-other-companies-quietly-changing-your-terms-service-could-be-unfair-or-deceptive (Technology Blog: Feb. 13, 2024)

Rupp C. (2023): Wie der öffentliche Sektor KI schon einsetzt (S 29–31), Fachzeitschrift Innovative Verwaltung, Ausgabe 11/2023, Springer Fachmedien Wiesbaden (ISSN 1618-9876), https://www.springerprofessional.de/wie-der-oeffentliche-sektor-ki-schon-einsetzt/26299462

Schmeling, J., Bruns, L. (2020): Qualifica Digitalis Metastudie: Kompetenzen, Perspektiven und Lernmethoden im digitalisierten öffentlichen Sektor, https://qualifica-digitalis.de/wp-content/uploads/QD_Metastudie_20201005_barrierefrei_v5.pdf

Stich R, Schwiertz F (2021): Digitale Transformation: Der Wandel der Arbeitswelt und der Führung in der digitalen Verwaltung. In: Seckelmann M, Brunzel M (Hrsg) Handbuch Onlinezugangsgesetz: Potenziale – Synergien – Herausforderungen, 1. Aufl. Springer, S 441–462 https://doi.org/10.1007/978-3-662-62395-4