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Digital Inclusion Initiative

Towards Digital Justice

Digital Inclusion Initiative: Comparative Report

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
BiH	Bosnia and Herzegovina
CSOs	Civil Society Organisations
DESI	Digital Economy and Society Index
DII	Digital Inclusion Initiative
EC	European Commission
EU	European Union
GIZ	German Organisation for International Cooperation
ICILS	International Computer and Information Literacy Study
ICT	Information and Communication Technology
ITU	International Telecommunications Union
MIAPA	Ministry of Internal Affairs and Public Administration (Kosovo)
MoLEVSA	Ministry of Labour, Employment, Veteran and Social Affairs (Serbia)
MoIT	Ministry of Information and Telecommunications (Serbia)
NEET	Not in Education, Employment or Training
OECD	Organisation for Economic Co-operation and Development
OSCE	Organisation for Security and Co-operation in Europe
RCC	Regional Cooperation Council
SES	Socio-Economic Status
SIPRU	Social Inclusion and Poverty Reduction Unit (Serbia)
SHPIK	Kosovo Informatics Society
SMEs	Small and Medium-sized Enterprises
UN	United Nations
UNDP	United Nations Development Programme
USAID	The United States Agency for International Development
UNICEF	United Nations Children's Fund
WB	Western Balkans

INTRODUCTION

This comparative report was developed within the Digital Inclusion Initiative (DII) project, a regional initiative implemented in Albania, Bosnia and Herzegovina, Kosovo, North Macedonia, and Serbia, and funded by the European Commission. The project aims to enhance the role of civil society organisations (CSOs) from the Western Balkans (WB) in advocating for participatory democracy and the EU accession process by strengthening their capacities for policy development and digital inclusion advocacy.

The report synthesises findings from national reports prepared by partner organisations in each participating country[1]. It provides a comprehensive overview of the current state of digital inclusion in the WB region, highlighting disparities in access to technology, internet connectivity, digital literacy and the utilisation of digital tools and services. Special attention is given to the vulnerability of specific population groups, including older persons, persons with disabilities, rural populations and ethnic minorities, who face increased risks of digital exclusion.

In addition to mapping the strategic and legislative frameworks governing digital inclusion, the report examines the interconnected dimensions of fi-

1 Data and information presented in the national reports were collected through a policy questionnaire administered following the analysis of digitalisation and digital inclusion policy documents. Additionally, consultations with relevant institutions, experts, digital service users, members of vulnerable groups, and civil society organisations, along with focus groups, were used to complement desk research and gather stakeholders' perspectives on equity-related issues in the digitalisation process. These consultations also helped to formulate recommendations for policy improvement.

nancing, governance, monitoring and evaluation, as well as the roles of governmental and non-governmental actors. It highlights the transformative potential of digital empowerment and the importance of inclusive digital policies in fostering equitable access to public services, education, employment and civic participation.

By presenting key findings and cross-country comparisons, the report provides a foundational understanding of the challenges and opportunities for advancing digital inclusion in the Western Balkans. The recommendations derived from national analyses are generalised to support policymakers across the region in identifying gaps, prioritising interventions, and shaping effective, context-sensitive digital inclusion strategies.

Except where explicitly referenced, the sources of information are the national reports of the DII project countries.

1. WHY IS DIGITAL INCLUSION IMPORTANT?

People are at the centre of the digital transformation in the European Union. Technology should serve and benefit all people living in the EU and empower them to pursue their aspirations, in full security and respect for their fundamental rights (European Commission, 2023).

The digital transformation is a transition that countries and communities worldwide are currently undergoing. Digital technologies are integral to the digital transformation, encompassing software and hardware for various information and communication technologies (ICTs), the internet, content, and services, as well as the skills and knowledge necessary for their effective use. Technological development is fast-paced, and so is digitalisation, which has raised increasing concerns about the emerging inequalities between those who have access to technology and those who do not (Parsons & Hick, 2008; Robinson et al., 2015).

Namely, there is relatively sustainable evidence that socio-economically disadvantaged groups, such as older people, the uneducated, ethnic minorities, and citizens with disabilities, tend to have limited capacity to access ICTs and lack elementary digital competences (Armitage & Nellums, 2020). Therefore, digitally excluded individuals and communities may be at risk of being unable to exercise their fundamental rights, such as access to education, healthcare, or the right to work, as there are strong reciprocal relationships between digital inclusion and both healthcare and education. In both cases, the benefits of digital technologies are indisputable; however, they can only be fully realised once digital inclusion is ensured. This leads to further marginalisation and a deepening of inequalities. Digital exclusion, a consequence of these inequalities, leads to numerous adverse outcomes for the individual, including poor health, inadequate incomes, and a higher risk of marginalisation (European Commission, 2019).

Multiple conceptual frameworks for **digital exclusion** exist worldwide, and recent literature suggests that digital exclusion spans three levels: digital access, digital skills (including attitudes), and usage, as well as the tangible outcomes of using technology that can result in offline benefits (Van Deursen & Helsper, 2015). The International Telecommunication Union (ITU) defines digital inclusion as encompassing various initiatives to provide citizens with equal access and equip them with the necessary competences to benefit from digital technologies (ITU, 2019). Framed this way, it is clear that the issue is more complex than just a matter of access to ICT, particularly concerning internet connectivity and device availability. Therefore, **digital inclusion** is a form of social inclusion in the digital age since an increasing number of daily activities are carried out online. Exclusion or limited access to the internet prevents citizens from taking advantage of opportunities that would otherwise remain unavailable to them.

2. DIGITAL INCLUSION FRAMEWORK IN PROJECT COUNTRIES

European policy

The **European Declaration on Digital Rights and Principles for the Digital Decade** clarifies the EU's vision of the digital transformation and provides guidelines for policymakers. It emphasises: putting people at the centre of the digital transformation; supporting solidarity and inclusion, through connectivity, digital education, training and skills, fair and just working conditions as well as access to digital public services online; reaffirming the importance of freedom of choice in interactions with algorithms and artificial intelligence (AI) systems and in a fair digital environment; fostering participation in the digital public space; increasing safety, security and empowerment in the digital environment, in particular for children and young people, while ensuring privacy and individual control over data; and promoting sustainability (European Commission, 2023).

The Decision on the **Digital Decade Policy Programme 2030** sets out specific digital targets based on four cardinal points: digital skills, digital infrastructures, digitalisation of businesses and digital public services.

The governance framework for the Digital Decade is based on an annual cooperation mechanism between the EU Commission and Member States, which consists of:

- A structured, transparent and shared monitoring system based on the Digital Economy and Society Index (DESI) to measure progress towards each of the 2030 targets.
- An annual report in which the Commission evaluates progress and provides recommendations for action.
- Adjusted Digital Decade strategic roadmaps, prepared every two years, in which the Member States outline adopted or planned actions to reach the 2030 targets.
- A mechanism to support the implementation of multi-country projects through the European Digital Infrastructure Consortium.

Candidate and potential candidate countries are seeking to align as closely as possible with the EU policy framework. A review of national policies in the countries participating in DII shows a clear intention to address all areas highlighted by the EU and to align data collection and monitoring systems with the Digital Economy and Society Index (DESI). Still, the level of policy development varies across different areas and between countries. This is unsurprising, as digitalisation requires the harmonisation of legal documents across

all sectors, which is a demanding and time-consuming process. Additionally, in all DII participating countries, insufficient coordination between the sectors and weak enforcement of policies are often identified as the primary cause of implementation challenges.

Conceptual framework in project countries

Although all project countries have a policy framework that is directly or indirectly linked to digital inclusion and digitalisation—addressed as a strategic priority in some form in all countries, as presented in Table 1—digital inclusion is not explicitly defined in national legislation. It is typically outlined across several strategic documents, and all countries, except Bosnia and Herzegovina, have specific umbrella strategies guiding their national digital agendas. Some countries also have separate, more targeted strategies for digital infrastructure (Albania), digital skills (Serbia), or other aspects of digitalisation.

Table 1. Overview of the conceptual frameworks for digital inclusion in DII project countries

Country	Defined as a standalone concept	Strategy addressing the digital agenda	Digital inclusion is addressed in other strategies
Albania	Digital inclusion is understood as a combination of broadband access, digital literacy and reduced digital disparities, particularly in rural and marginalised communities.	National Broadband Plan (2020), Digital Agenda 2025.	Education Strategy 2021–2026 includes digital skills; e-Government and ICT policies cover the inclusion of vulnerable groups.
Bosnia and Herzegovina	Not defined as a standalone concept but linked to ICT development.	Digitalisation priorities within the Strategic Framework for Public Administration Reform and the Digital Agenda for the Western Balkans.	Education Reform Strategies and employment policies integrate digital skills and access, with references to the inclusion of disadvantaged groups.
Kosovo	Framed within ICT development and broadband expansion.	Digital Agenda for Kosovo 2030.	Education Strategy 2022–2026 integrates digital skills; ICT access and inclusion measures are addressed in youth and employment strategies.
North Macedonia	Digital inclusion is not a separate policy concept.	National Operational Broadband Plan, Digital Agenda 2025, and e-Government Strategy, ICT Strategy (under adoption during the reported period)	Education Strategy 2018–2025, with a focus on digital competences, and social inclusion programmes referring to ICT accessibility.
Serbia	Not defined as a standalone concept but linked to the broader digital agenda and digital skills development.	Programme for the Development of Broadband Communication Infrastructure in Rural Areas (2020), AI Development Strategy (2020–2025), E-Government Development Programme (2019–2022), and the Digital Serbia initiative.	The Education Development Strategy until 2030 (SEDS 2030) highlights digital competence as one of the key competences. Additionally, the Digital Skills Development Strategy 2020–2024 outlines measures targeting ICT access for vulnerable groups, including persons with disabilities and rural populations.

Conceptualising digital inclusion in research and academic papers remains an ongoing process, with several definitions coexisting and being used simultaneously; therefore, variations in national policies are to be expected. It is important to note that the operational definition of digital inclusion enables policymakers to identify and target specific populations, allocate resources effectively and establish benchmarks for progress. Conversely, vague or overly narrow definitions can result in unfocused or mistargeted policies that fail to address critical barriers or deliver measurable outcomes.

Based on the findings from national reports, it can be concluded that in Albania, digital inclusion is not explicitly defined in legislation. However, its components are addressed across various strategies, typically focusing on broadband access, digital literacy and reducing disparities.

In Bosnia and Herzegovina, the concept is implicitly present through the emphasis on digitalisation, ensuring access to the internet and ICT, and promoting participation in the digital society regardless of gender, age or profession, as well as the need to include vulnerable groups (in federal and district strategies).

Kosovo's policies emphasise infrastructure development, digitalisation of public services and enhancing digital skills among the general population, while gaps remain in addressing digital skills for vulnerable groups.

In North Macedonia, policies extend beyond access and infrastructure and include competence development and social inclusion, addressing vulnerable groups such as persons with disabilities and the elderly, while in Serbia, there is no unified definition of digital inclusion, but some reports (e.g. SIPRU, 2021) suggest that digital inclusion should be understood as a triad comprising access, skills and motivation.

Policy reviews, as well as consultations with national stakeholders during the development of national reports in all countries, also reveal that the concept of digital inclusion is not as holistic as it is defined in research and academic papers. A crucial distinction is the comprehensiveness of the conceptual framework for digital exclusion, specifically whether it ensures that the most digitally excluded individuals are accurately identified as either 'excluded' or 'vulnerable' within other policy domains. Mostly overlooked aspects include the tangible outcomes of using technology, which can result in offline benefits (Van Deursen & Helsper, 2015), as well as the impact on overall well-being and the issue of motivation (Ragnedda et al., 2022).

Regarding the legislative framework, the project countries' legislation covers most or all key aspects of digital inclusion; however, it is fragmented and spread across various sectors. Multiple strategies, laws and procedures related to digitalisation each have their own goals, indicators, accountability mechanisms and implementation timelines, creating a complex and challenging context for those seeking to focus on digital inclusion. Adding to this complexity is the overlap with social inclusion policy frameworks across multiple sectors, including health, education, social protection and employment.

Data

As can be concluded from the national reports of the project countries, data on digital competences and digital inclusion are not being strategically collected in each of the countries, and databases across sectors are not connected or aligned.

Data on the general population serve as a good benchmark, but data on specific groups say much more about equity risks in digitalisation. Namely, the disaggregation of data in national statistics is typically based on common socio-demographic characteristics, but these are often unavailable for certain vulnerable groups, such as persons with disabilities or specific communities (e.g. ethnic groups). For vulnerable groups, data mostly come from sporadic national or international research reports or smaller-scale surveys. A particular limitation for all countries is the absence of national data for groups that face multiple barriers but are not visible in official statistics. This is partly due to the lack of a policy monitoring mechanism, which will be addressed later in the text, and to the absence of a clear conceptual framework for digital inclusion.

Also, stakeholders consulted for national reports indicated that statistics do not fully reflect the reality on the ground. For example, where disaggregated data are available, the rates tend to be lower for older persons, especially regarding the use of e-services. While there is no disaggregated national data in project countries for all vulnerable groups, the available data show a similar trend to that in EU countries.

From available data (Figures 1 and 2), we can gain general insight into the national context and structural conditions that shape digital inclusion.

Figure 1. Percentage of the population actively using social media

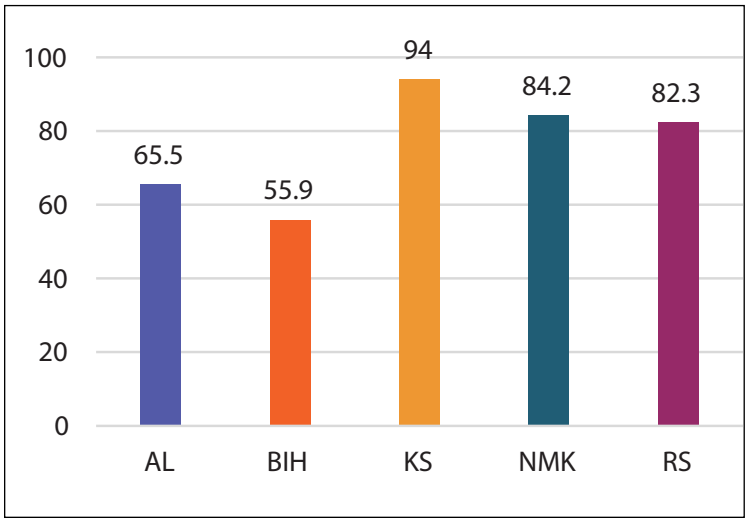
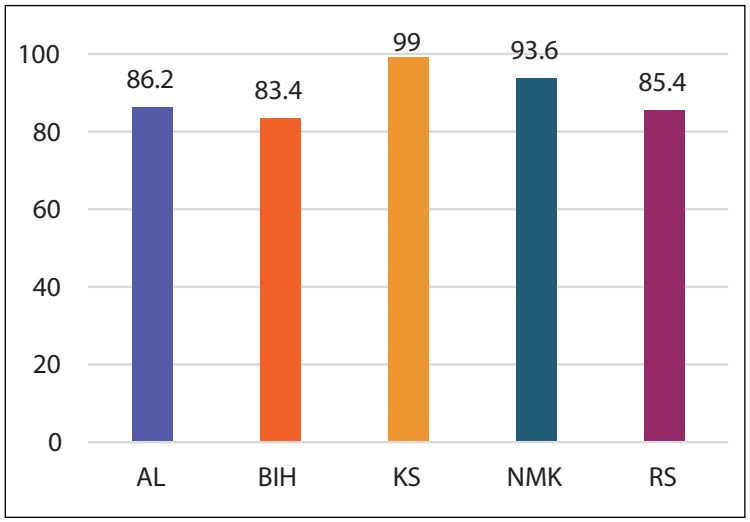
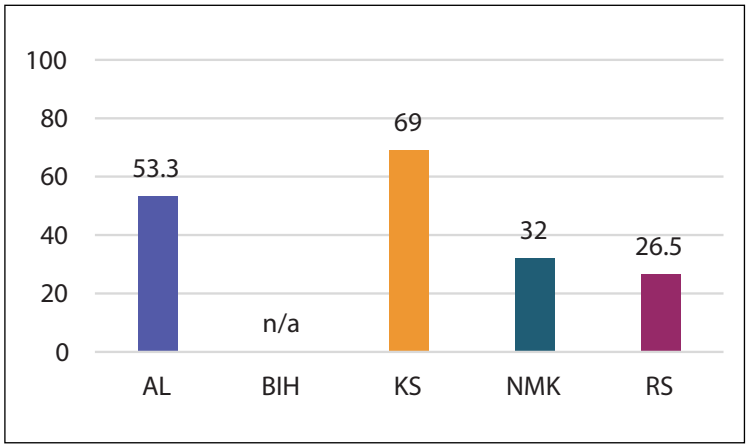


Figure 2. Percentage of the population using the internetmedia



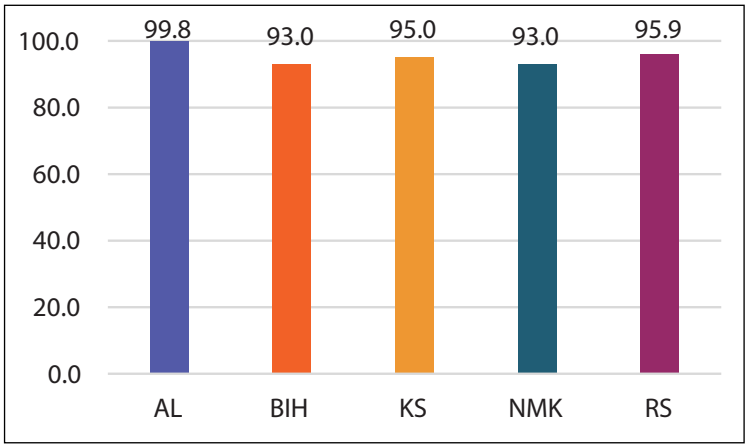
As presented, internet use is almost universal in all countries. However, people usually engage with digital technologies for social media purposes, rather than for accessing services, learning, or participating in activism.

Figure 3. Percentage of the population using e-government services



At the same time, despite widespread internet and smartphone usage, the rate of e-government service use[2] is lower than for other types of digital engagement, as presented in Figures 3 and 4.

Figure 4. Percentage of the population using smartphones or other mobile devices to access the internet



However, there are some specific characteristics of the countries, outlined below.

In Albania, despite 86.2% of the population using the internet, usage is slightly lower among women (81.7%) and significantly lower among older people aged 65–74 (52.7%). Older adults and low-income individuals often rely on intermediaries (e.g. internet cafés or family members) to access digital services, which can lead to issues with data privacy and the reliability of access. These groups often lack the digital skills or tools to use services like e-Albania independently, and they are excluded from statistics that measure meaningful use.

Many citizens in Bosnia and Herzegovina primarily use the internet for entertainment, while administrative and educational content remains inaccessible due to low levels of digital literacy and a lack of educational support. A concerning issue is that neither teachers nor other educational professionals are adequately trained, and there is no mapping of digital illiteracy by age, gender or disability.

Despite widespread mobile access (around 95% smartphone usage) in Kosovo, engagement with e-government services is notably lower at approximately 69%, particularly among the elderly (24.4%) and retired indi-

2 Data for BiH are not available.

viduals (22.1%). High social media use (94%) contrasts sharply with relatively low levels of digital skills, with only 28% possessing basic skills and just 14% demonstrating above-basic proficiency, highlighting a critical gap between general internet access and proficient digital literacy.

In North Macedonia, rural–urban disparities persist, with 38.4% of the population in rural areas facing significant barriers that limit access to e-services and opportunities. The Macedonian Model of E-Municipality project found that many municipalities lacked the necessary financial and technical resources, IT infrastructure and skilled staff for digital transformation, resulting in limited e-services and a widening digital divide.

The study Digital Skills of Serbian Citizens (Bradić-Martinović, 2022) highlights the digital divide and socio-demographic disparities. Information, communication, problem-solving, and digital content creation remain significantly below the EU average, and have been identified as the weakest areas, with older adults and low-income groups being most at risk of digital exclusion. Even Serbian youth, who are considered more digitally advanced, according to the International Computer and Information Literacy Study (ICILS) (Institute for Education Quality and Evaluation Serbia, 2024), score an average of 443 points on the computer and information literacy scale, which is 33 points below the international average.

A 2021 Regional Cooperation Council (RCC) report highlights that a significant digital divide exists in Kosovo, noting a skills mismatch in the labour market, where digital literacy and competences are lacking, particularly among older generations and rural populations. There are also disparities in digital skills between urban and rural areas, leading to the exclusion of rural communities from digital services and opportunities. Women, especially in rural areas, are identified as a vulnerable group facing greater risks of digital exclusion due to lower access to digital training and ICT resources.

At the same time, there are no comparable data on digital literacy in DII project countries, except for those available for DESI indicators[3] in some of them. As presented in Table 2, data from national reports are drawn from various sources (since not all national statistics monitor DESI indicators). Some originate from diverse reports (e.g. Bosnia and Herzegovina, Kosovo), while others come from national statistical offices (e.g. North Macedonia). Consequently, the data collection methodology also varies.

3 The European Commission has been monitoring Member States' digital progress through DESI reports since 2014. The frequency of data collection and the level of disaggregation differ between countries.

Table 2. Percentage of the population with basic, intermediate and advanced digital skills

Albania	Bosnia and Herzegovina	Kosovo	North Macedonia	Serbia
Basic 34.4%; intermediate 23.6%; advanced 6.5% (2023)	Basic 35.3%; advanced 9% (2022)	Basic 28%; above basic 14% (2019)	Basic 35% (2021)	Basic 41%; advanced 12% (2022)

Even though approximately one-third of the population in all project countries possesses basic digital skills, this is still below the EU level[4] and far off track for the 2030 projections (80%)[5]. Again, there are nuances related to specific groups.

It is worth noting that even at the EU level, the pace of progress in digital literacy remains insufficient. Based on current trends, the EU is expected to reach a level of just under 60% by 2030. Additionally, there is a 41.8% gap in basic digital skills between individuals aged 16-24 and those aged 65-74, and although young people are often seen as digitally 'native', they are not universally digitally literate—43% of eighth-grade students (aged 13 to 14) do not reach basic levels of digital skills. Persistent disparities continue to reflect socio-economic background and geographical location (European Commission, 2025).

Governance

Ensuring the effectiveness, as well as the equity, of digitalisation requires robust governance. The complexity of this issue obliges national authorities to align digital measures, share best practices, and assess emerging challenges in the regulatory landscape.

Overlaps and fragmentation present in legislation are also reflected in the national governance structures of all project countries. Responsibilities for the digitalisation agenda are distributed across various ministries and levels of government. Countries are addressing this fragmentation by establishing new advisory or executive bodies linked to digital issues, which support internal coordination among sectors and improve strategic alignment.

Some degree of governance fragmentation in project countries is to be expected, as digitalisation is a complex process; still, national stakeholders strongly advocate for the establishment of bodies dedicated specifically to digital inclusion.

Situation per country is as follows:

In Albania, the National Agency for Information Society, operating under the Prime Minister's Office, is primarily responsible for digitisation and digital technologies.

4 In 2023, only 55.6% of adults had at least basic digital skills.

5 The target set in the EU Digital Decade Policy Programme.

This agency coordinates the development and administration of state information systems, promotes the information society, and manages the e-Albania portal, facilitating citizen access to electronic public services. Additionally, the Ministry of Infrastructure and Energy oversees telecommunications and broadband development, implementing the National Broadband Plan and related policies. The Electronic and Postal Communications Authority serves as the regulatory body for electronic communications and postal services, ensuring compliance with national policies.

At the level of Bosnia and Herzegovina (BiH), the key institution responsible for digitalisation, digital technologies, and telecommunications is the Ministry of Communications and Transport. This ministry is responsible for strategic planning and coordination of policies related to digital transformation and the development of the information society. The technical and operational aspects of digital infrastructure and identity are handled by the Agency for Identification Documents, Registers and Data Exchange of BiH. This agency plays a vital role in implementing e-services and digital identification cards and is responsible for managing identification documents, central registries, and data exchange among state institutions.

Digitalisation and digital technologies in Kosovo fall primarily under the purview of the Ministry of Economy, which oversees the telecommunications sector through the Regulatory Authority of Electronic and Postal Communications. In parallel, the Ministry of Internal Affairs and Public Administration (MIAPA) is responsible for advancing e-government initiatives, managed through its subordinate Agency for Information Society, which coordinates digital transformation across public institutions. At the same time, the Cyber Security Agency (also under MIAPA) focuses on protecting digital infrastructure. Moreover, the strategic framework mandates the establishment of a high-level commission, led by the Prime Minister and comprising representatives from a wide range of government ministries, specialised regulatory and executive agencies and public companies, as well as academia, to coordinate, implement, and monitor the national digital transformation agenda, thereby ensuring a comprehensive and integrated approach to digital access and inclusion.

In North Macedonia, the National Council for Digital Transformation was established as an intersectoral body to promote inclusive digital development. The Prime Minister chairs this Council, which comprises 12 other members, including ministers, representatives of the business chamber, and academics. The Council, however, does not include CSOs, which could potentially further support its work, given their proactive role in addressing digital inclusion.

In Serbia, the Ministry of Information and Telecommunications (MoIT) and the Office for IT and e-Government are the leading institutions in the field of digitalisation. The Office for IT and e-Government serves as the central coordinating body for implementing digital government services and digital inclusion policies across various sectors. It plays a key role in coordination among ministries responsible for education, labour and public administration.

Additionally, the Office designs, develops, and maintains e-government infrastructure and manages the Government Data Centre in Kragujevac. It also houses the Centre for the Security of the ICT System in the Republic's Bodies.

Considering the current situation, it is no surprise that most consulted stakeholders have questioned the efficiency and effectiveness of the existing governance structure in project countries. They mainly criticise the absence of formal coordination mechanisms; fragmentation of measures, overlaps in jurisdictions, and uneven levels of commitment among public bodies. This hinders digital inclusion, as its complexity demands a high degree of alignment and availability of quality and robust data for digital inclusion measures. National reports do not mention any mechanisms through which marginalised groups and their representatives are included in the governance of digitalisation. However, since the issue of representation arose in stakeholders' narratives in most countries (Serbia, North Macedonia, Albania, and Bosnia and Herzegovina), it can be assumed that these mechanisms are either weak or non-existent. Another challenge mentioned is the lack of ongoing staff training, meaning that competences within the system often do not keep pace with the rapid digital development.

Monitoring and evaluation

Establishing comprehensive and consistent monitoring methods and mechanisms is essential for evidence-based policymaking, enabling countries to identify specific barriers to digital inclusion and develop targeted, effective interventions. The alignment of strategy and monitoring is crucial for ensuring that digital inclusion efforts are both efficient and impactful for vulnerable populations. Additionally, regular, persistent and detailed monitoring that extends beyond digital access and skills is essential for accurately measuring actual levels of digital inclusion and exclusion.

However, although governments in project countries claim strong strategic commitment to digital inclusion at a policy level, a noticeable gap exists between the countries' strategic objectives/initiatives and the implementation of actual monitoring practices. Namely, in Albania, the strategic-legislative framework provides for a system for monitoring and evaluating the achievement of targets and strategic goals. This includes periodic evaluations and emphasises cross-institutional coordination, continuous performance assessment and public reporting. Yet, policy implementation is rarely evaluated against outcomes relevant to vulnerable groups, as monitoring tends to focus on infrastructure coverage or service availability rather than meaningful access or user empowerment.

In Bosnia and Herzegovina, the strategic and legislative frameworks formally include provisions for monitoring and evaluating strategic goals by competent ministries and institutions at the entity and cantonal levels. Nevertheless, there is no integrated system to monitor the impact of digital measures on vulnerable groups. Mechanisms for user feedback, which would allow citizens to contribute to the development of digital policies, are also lacking.

The Digital Agenda of Kosovo 2030 and the e-Government Strategy incorporate performance indicators that are periodically reviewed and updated, facilitating the monitoring of progress toward their strategic objectives. However, concerns remain regarding the adequacy and transparency of the existing evaluation frameworks. Specifically, the lack of transparency and detailed monitoring reports, with clear and accessible feedback on policy effectiveness and impacts, is criticised, particularly regarding targeted outcomes for vulnerable groups and rural communities. Another shortcoming mentioned is the lack of systematic data collection and analysis to measure the tangible impacts of digital policies, especially those designed to address digital literacy and the specific needs of marginalised populations.

In North Macedonia, several strategic documents outline commitments for monitoring and evaluation, but it is unclear which institution specifically oversees digital inclusion policies. The Ministry of Digital Transformation and interministerial working groups, coordinated by the Prime Minister's Office, are designated to have monitoring roles, as is the Agency for the Protection of the Right to Free Access to Public Information; however, no public reports are available. Focus groups with policymakers and representatives of citizens' organisations highlighted that the lack of intra-institutional coordination and the absence of a clear definition of digital inclusion make it difficult for institutions to systematically track progress in digital inclusion.

In Serbia, strategic and legislative frameworks on digital access and inclusion incorporate mechanisms for monitoring and evaluation, which are typically established within the implementing ministries responsible for these processes, resulting in a high degree of fragmentation. A unified monitoring mechanism for tracking and evaluating digital equity and inclusion across sectors is still lacking.

Considering the situation, it can be concluded that monitoring is challenging in all project countries for several reasons. First, there is no clear definition of digital inclusion, or it is not appropriately conceptualised, making it difficult to develop a comprehensive and consistent monitoring framework. Second, governance fragmentation persists, and although institutions and bodies are obliged to monitor progress in their designated sectors and regarding their policies, there is no framework or mechanism to capture the synergistic impact of these policies. Therefore, it is essential to emphasise that to effectively inform and prioritise political objectives, it is necessary to monitor both the efforts undertaken in various sectors and their measured impacts. The lack of comprehensive monitoring of the results of different actions prevents the evaluation of the effectiveness of policy initiatives and strategies.

Financing

Under the **Digital Decade Policy Programme 2030** (European Parliament, 2022)**,** EU Member States reported investments of EUR 24.6 billion in the development

of basic digital skills (336 measures planned in their Roadmaps). Planned measures primarily focus on improving digital skills within formal education. For the training of ICT specialists, EU member states reported investments totalling EUR 11.8 billion.

In the project countries, it is difficult to precisely track how digital inclusion has been financially supported, as it is not a standalone policy area. Most available data refer to large-scale national digitalisation programmes, which are usually focused on ICT infrastructure. For example, in Albania, significant investment has been committed to the National Broadband Plan (2020–2025), with funding sourced from the state budget, EU IPA funds, and the Western Balkans Investment Framework, while in North Macedonia, a project supported by the Western Balkans Investment Framework focuses on expanding ultra-fast internet access from 43.8% to 60% of households. It targets 47,000 additional households through the construction of a National Transport Optical Network to connect underserved 'white' and 'grey' zones, as well as public institutions.

It is worth mentioning that for all project countries, the Digital Europe Programme is available as an avenue for funding digital infrastructure, cybersecurity, and digital literacy (EUR 7 million); however, there is no information on the extent to which this programme has been utilised.

Tracking investment in skills is challenging because it encompasses both formal and non-formal education, various educational levels, and different types of training. Based on national reports, it can be concluded that all countries have some measures targeting formal education. One funding priority is ICT infrastructure for educational institutions, including broadband internet access and ICT equipment for schools. Another is the integration of digital competences into the curriculum and the development of educational programmes.

For example, in Kosovo, the Ministry of Education has allocated EUR 15 million specifically for digital equipment in pre-university education, directly promoting digital inclusion, while the Albanian-American Development Foundation has introduced an ICT curriculum in elementary education in Albania to help narrow the digital divide in the country.

In BiH, the capital budget of the Brčko District for 2025 includes approximately EUR 3,579,114 for school equipment in the education sector. In North Macedonia, one of the major projects in the country's digitalisation efforts has been the Macedonia Connects project, funded by the United States Agency for International Development (USAID) and the Macedonian government (a total of USD 5 million), which aimed to provide internet access to 95% of the population and connect all 461 primary and secondary schools.

Some national reports specifically mention allocated funds for vulnerable groups, primarily the rural population. For example, the Brčko District, with the support of the Government of the Czech Republic and CARE International/RGFBD, has implemented a project targeting social inclusion of vulnerable groups through employment and digital education (CARE International, 2024).

In Albania, the social protection sector has introduced targeted programmes aimed at reducing barriers for people with disabilities, supported by funding under the 2024–2030 strategy for assistive technologies and inclusive service design. The above-mentioned National Broadband Plan also prioritises rural and underserved areas, aiming to reach the EU's Gigabit Society targets.

The main issues identified in national reports regarding the financing of digital inclusion are a lack of transparency, financial sustainability, and limited targeted support for certain marginalised communities. Support for vulnerable groups, excluding rural communities, often relies too heavily on donor funding rather than on systematic and sustainable national budget allocations. Institutions often rely on external donors for digital projects, which can hinder their ability to ensure the long-term sustainability of these projects. Furthermore, specific support for vulnerable groups is typically project-based and has a limited duration. Local self-governments frequently lack the technical and financial capacity to implement inclusion-related initiatives, despite being key actors in service delivery. A misalignment between capital investment in digital infrastructure and professional development for public sector employees has been cited as a major barrier to realising the goals of national strategies.

The following are some of the challenges related to financing in each country.

Albania: Older adults and low-income families often pay intermediaries to access e-Albania, suggesting that investment in platforms is not matched by investment in user accessibility or digital literacy. Teachers have reported receiving only short, theoretical digital training programmes, while schools continue to lack the necessary infrastructure and maintenance support.

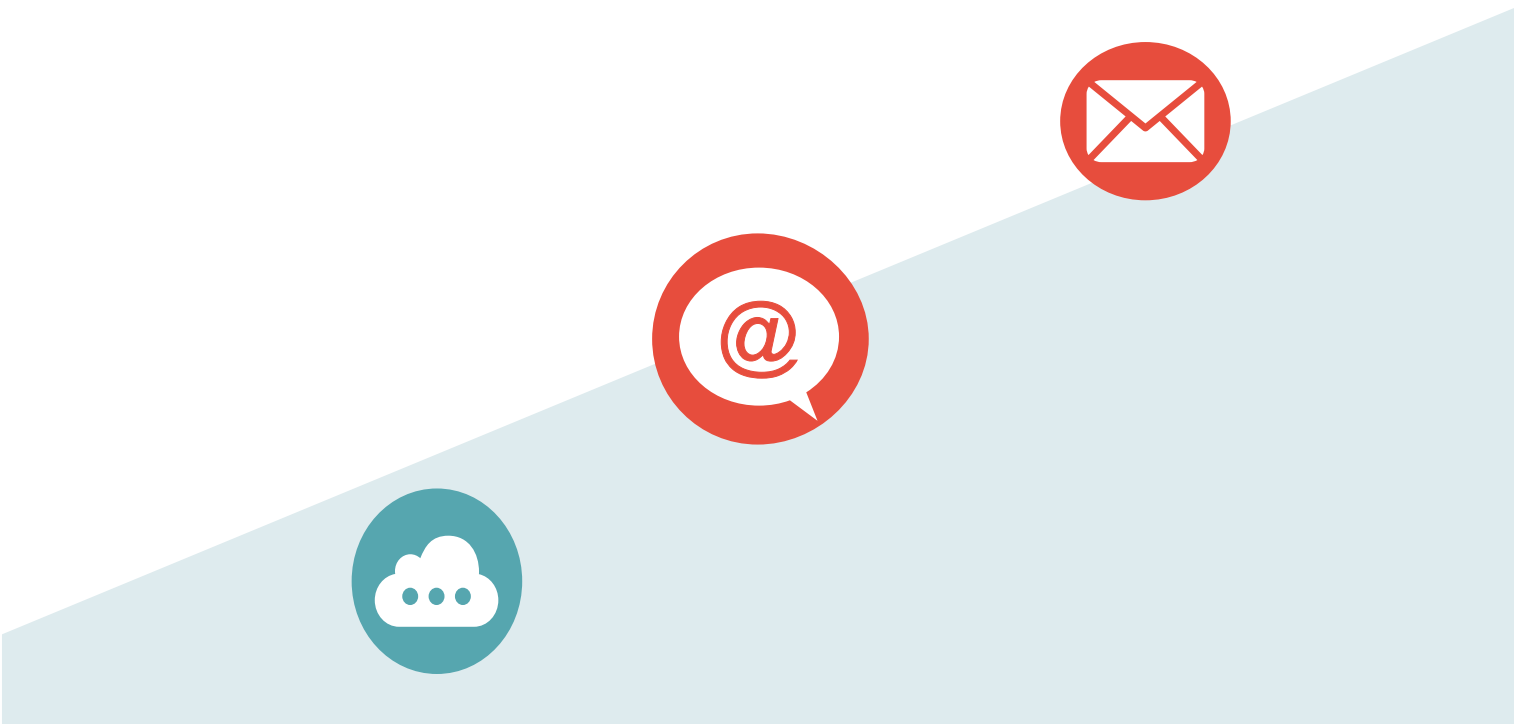
Bosnia and Herzegovina: A UNICEF report (2022) notes that schools often receive digital equipment without staff training, which reduces the effectiveness of these investments. Funding for digitalisation in Bosnia and Herzegovina comes from multiple sectoral budgets, including education, communications and transport, economic development, science and technology, health, and social protection. Given BiH's complex administrative structure, there is no unified national budget framework. Instead, funds are allocated through sectoral or entity-level strategies and programmes.

Kosovo: There have been delays and underutilisation of allocated funds within the Ministry of Education for digital equipment procurement, with much of the budget remaining unspent despite clearly identified needs at the school level. Additionally, limited targeted support has been noted for marginalised communities such as Roma, Ashkali, and Egyptians, who often rely heavily on donor-funded initiatives rather than consistent government funding.

North Macedonia has established a national legal environment comparable to that of several EU Member States. It has developed three strategic documents focusing on the users of public services that are un-

dergoing digitalisation: the Methodology for Including End-Users in the Process of Improving Public Services, the Service Optimisation Guidelines, and the Standards for Service Delivery. The Standards for Service Delivery specifically state that services should be available to everyone. They further specify that the administration should provide services that everyone can use, including individuals with disabilities or other legally protected characteristics, and that these services should be accessible to people who do not have internet access or who lack the skills or confidence to use it. However, while these efforts demonstrate a commitment to enhancing digital skills, the policies fall short of ensuring widespread access to digital devices and reliable internet, particularly for vulnerable groups (EU Agency for Fundamental Rights, 2023).

Serbia: Stakeholders pointed out that projects, such as digital skills training for hard-to-employ individuals, often rely on donor support and are not integrated into long-term national financing frameworks. Similarly, the most impactful digital inclusion initiatives are externally funded and remain unsustainable due to a lack of institutional backing or inclusion in regular budget lines. Additionally, teachers and school-level staff have reported that although some funds have been allocated for infrastructure and digital equipment, little to no funding has been earmarked for pedagogical training or the provision of assistive technologies.



3. VULNERABLE GROUPS AND DIGITAL EXCLUSION

Risk factors for digital inclusion

A binary perspective, distinguishing between those who have physical access to the internet and ICT and those who do not, is referred to as 'the first level of digital divide', a concept widely used by researchers and policymakers. This means that the foundation of digital inclusion lies in digital accessibility**,** which reflects the opportunities to access the components of digital technologies, such as hardware, software, and information. There are four feature categories in the digital accessibility layers, namely availability, connectivity, affordability, and assistive design (Nguyen, 2022).

However, data show that this perspective is insufficient to explain differences across the population. Today, 95% of the global population has access to at least 3G mobile broadband networks, but a notable 5% (around 400 million people) still lack coverage. There is a significant 'usage gap' where more than 2 billion people, representing 28% of the global population, remain offline despite having access to mobile broadband network coverage. This gap is more than five times larger than the 'coverage gap', highlighting that people face other barriers preventing them from getting online, such as affordability, concerns about online safety and security, a lack of digital skills and literacy, or inadequate provision in local languages and contexts (UNDP, 2024a). This gap is also evident in project countries. For example, the Kosovo National Report mirrors this finding, stating that *"while national broadband coverage is nearly universal, access to digital technologies remains uneven, particularly for rural communities and marginalised socioeconomic groups."*

Regarding other risk factors, researchers and policymakers have recently recognised the complexity of the digital exclusion problem by linking it to differences in skills possessed by internet users and socio-cultural and economic backgrounds (Dobrinskaya & Martynenko, 2019; Robinson et al., 2015), economic status, and broader social inequalities such as gender, age, level of education, and ethnic background (Ragnedda et al., 2022).

Vulnerable groups

Generally, digitally excluded individuals and communities are more likely to be older adults, those with low income or lower educational attainment, people living in rural areas or persons with disabilities (Borg et al., 2019). Similarly, the European Commission (2025) notes that older adults, individuals with low levels of education, and those not in employment or seeking employment face disproportionately high risks of digital exclusion.

A meta-analysis conducted by Pérez-Escolar and Canet (2023) on 331 studies found that older adults

are the most likely group to be excluded from the digital realm, as 32.56% of publications reflect concerns about assisting older people in achieving digital inclusion. This group is followed by persons with disabilities (20%), poor communities, homeless individuals or low-income families (18.14%). Women and the gender divide (10.23%), and ethnic minorities (6.51%) are also identified as vulnerable groups, as well as adolescents and teenagers (3.25%) and children (2.33%).

Nevertheless, digital inclusion (or exclusion) is a multidimensional phenomenon, and a person can be excluded in different ways. It is rare for one group to face digital exclusion due to a single factor; usually, they encounter multiple barriers.

Among these broad categories, there are specific clusters of inequality, such as women in rural communities, who are especially vulnerable, as well as schoolchildren from low-income families with multiple siblings, migrants and ethnic minorities facing discrimination.

Based on the findings of the research above and the risk factors discussed, the following vulnerable groups have been identified in all project countries: older persons, persons with disabilities, individuals with low socioeconomic status (SES), low-educated and unemployed individuals, the rural population, and Roma and other ethnic minorities. Women and children are subcategories within each of the listed groups and are particularly highlighted.

Low socioeconomic status / low education level

As mentioned, in all countries, individuals with low SES are considered particularly vulnerable to digital exclusion. The barriers they face in accessing digital technologies reflect the existing economic divide between low- and high-income groups, which often correlates with other forms of exclusion. However, while the solution to this barrier may appear simple, the financial investment and support it requires are not that straightforward. A conclusion drawn by Albanian stakeholders clearly illustrates how even sufficient funding is not a panacea: "*Funding tends to prioritise infrastructure and platforms, with insufficient investment in human-centred components such as support services, training, accessibility features, or local-level implementation*". In Bosnia and Herzegovina, a similar issue has been reported: "*Budgets often do not include equipment procurement or staff training. Even where budgets exist, they are typically short-term and exclude marginalised groups*". Investment in national-level infrastructure, as Serbian stakeholders pointed out, "*sometimes misses the target, leaving the low SES population still without access to ICT because it remains unaffordable for many*", a point also confirmed by other research (European Commission, 2025; ITU, 2021).

The low economic status of families disproportionately affects the youngest members. Students from socioeconomically disadvantaged families often have limited access to digital resources at home, resulting in com-

paratively lower digital competences and an inability to participate in the education process when it includes online learning. Individuals from these groups, already facing multiple social barriers due to digital exclusion, encounter additional challenges in exercising their basic human rights, as the majority of social, economic, political, and health activities — such as social assistance, banking, and booking doctors' appointments — have been digitised.

It should also be noted that material status not only affects when digital technologies are used but also correlates with how they are used. Researchers have found that individuals of lower SES tend to use simpler applications for communication and entertainment, whereas their counterparts use the internet for educational, economic, or service-oriented purposes (Van Laar et al., 2020). This also helps explain why e-services often fail to be accessible to the lower SES population, reducing their motivation to use them and consequently resulting in their exclusion from educational and employment opportunities in all the participating countries.

Older persons

Reports from all countries indicate that older persons face persistent difficulties in accessing and navigating e-services such as e-health and e-administration, often relying heavily on assistance from others. Digital literacy is lower in this population due to a lack of targeted programmes and training opportunities.

National stakeholders have identified limited digital literacy among older people as the main cause, alongside challenges related to the design and technical specifications of digital services. They have also highlighted the complexity of interfaces, difficulties with password management, and inadequate institutional support. Stakeholders emphasised the critical need for tailored support mechanisms, including dedicated help centres and simplified interfaces designed specifically for elderly and disabled users.

Albania: In the population aged 65–74, only 52.7% use the internet. An older adult interviewed for the national report shared, "*I do not know how to use it [e-Albania]. I go to the internet café, and they do it for me. Sometimes I pay twice because I did not understand what went wrong the first time*". Another interviewee noted that the delivery of e-Albania services through internet centres has led to exploitative practices, with instances of providers intentionally blocking users' accounts and demanding a payment of 500 lek (approximately EUR 5) to unlock them.

Kosovo: Despite widespread mobile access (approximately 95% smartphone usage), engagement with e-government services is notably lower among the elderly (24.4%) and retired individuals (22.1%).

North Macedonia: Internet usage among older people (65-74 years) is lower at 81.9%, compared with 93.6% for the total population. Older persons face digital exclusion due to limited digital skills, limited

or almost no access to digital skills trainings, and limited access to technology, with policies only recently beginning to address the need for accessible content for this group.

Serbia: While internet use among the general population is relatively high (85.4%), only 49% of older persons are internet users.

Similar to the low SES population, the older population usually faces several vulnerability factors, such as living in rural or deprived areas. For example, national statistical data show that people aged 65 and above constitute 10.97% of Kosovo's total population, while nearly half of the country's inhabitants live in rural areas. In Serbia, the population aged over 64 accounts for 22% of the total population. In the economically less developed regions of Southern and Eastern Serbia, approximately one in four people (23.7%) are over 64 years old.

The older population also faces a higher risk of some form of disability, such as hearing or vision impairment, which adds another layer of vulnerability and creates additional barriers to participation in the digital society.

Depending on the combination of vulnerability factors, older persons face different barriers; however, the common denominator is often lower digital literacy and fewer opportunities for education and training to enhance digital competences. Most national reports highlight the absence of adequate training opportunities for this population and the lack of support services that could help mitigate individual skill gaps.

Persons with disabilities

Persons with disabilities face limitations in accessing digital services in all project countries. They encounter barriers in accessing services and acquiring the assistive technologies necessary to participate in society. Persons with disabilities typically have lower incomes than their non-disabled peers; thus, in many cases, the cost of devices and connectivity services can be burdensome. Additionally, disabled individuals from low SES backgrounds may not be aware of the range of accessible online tools available and how to utilise them. Similar to the older population, the limited availability of adequate training opportunities restricts their ability to improve digital competence.

In more concrete terms, in Albania, persons with disabilities face particularly significant barriers. Platforms and public services are not designed with accessibility in mind. There is a lack of assistive technology in the Albanian language, no screen-reader compatibility, and no options for simplified content or sign language. As a result, visually and hearing-impaired individuals are systematically excluded from online services, despite being among those who would benefit most from digital access.

In Bosnia and Herzegovina, most digital services and platforms are not adapted for persons with various types of disabilities. Translation services (cultural mediators, assistants), enlarged display options, voice navigation, and content tailored for users with reduced cognitive or motor abilities are largely unavailable. Fur-

thermore, strategies such as the Digital Transformation Programme do not explicitly address children with disabilities, which focus group participants viewed as neglecting the inclusive dimension.

Representatives from HANDIKOS, Kosovo, have emphasised that persons with disabilities face severe limitations due to inaccessible digital services and the high costs of assistive technology, which remains out of reach for most individuals who need them.

At the same time, two-thirds of individuals with disabilities in North Macedonia lack access to assistive technologies, severely limiting their digital participation. Even when tools like text-to-speech exist, they are perceived as expensive and underfunded, and there is a widespread view that the state does not sufficiently prioritise funding for such essential assistive technologies. Despite policies like the National Strategy for People with Disabilities (2023-2030) mandating accessible e-services, practical implementation lags. Persons with disabilities continue to face barriers to political participation, including inaccessible voting stations and a lack of disability-friendly election materials. Social services and financial assistance schemes do not fully cover the diverse needs of persons with disabilities.

The situation in Serbia is characterised by the inaccessibility of public platforms, poor interface design and a lack of assistive technologies. There is also a lack of comprehensive national legislation that extends accessibility requirements to private digital services, such as online banking, e-commerce or e-books. This issue was further highlighted in interviews with representatives of Digitas 24, who noted that platforms such as the eGovernment (eUprava) and banking apps remain largely inaccessible to blind users due to the absence of alternative Completely Automated Public Turing test to tell Computers and Humans Apart (CAPTCHA) solutions, screen reader incompatibility and systemic design flaws that fail to accommodate assistive technologies.

Rural population

Rural areas face the risk of a 'double digital divide'. On the supply side, they are still lagging in terms of the provision of modern digital infrastructure (broadband networks, 5G networks, etc.). On the demand side, many rural areas lack the basic knowledge and understanding of digital technology's potential, so even if infrastructure is in place, it may remain underutilised (ENRD, 2017). However, a common point made by rural and remote communities is that without broadband access, they miss out on the opportunities it provides to improve their outcomes.

In Albania, rural areas have only 3.4% internet connectivity, with fixed broadband penetration at a mere 2%, compared to 12% in urban areas. A similar situation exists in Kosovo.

According to the Agency for Statistics of Bosnia and Herzegovina (2023), while over 90% of households in urban areas have internet access, the percentage is significantly lower in rural parts of the Federation, eastern Republika Srpska, Herzegovina-Neretva Canton and

the Brčko District. A similar pattern is observed in North Macedonia, where urban households have 92.1% internet access, while rural areas lag at 88.5%, with lower broadband penetration restricting access to digital services. Fixed broadband coverage stands at 88.8% nationwide across rural areas and communities, and among marginalised groups like Roma, who experience reduced access to high-speed internet.

Regarding Serbia, household-level data show that 88.8% of households have internet access; however, this percentage drops significantly among those in rural areas (84.3%). While smartphone-based access is almost universal (95.9%), access via laptops (53.9%) and personal computers (73.4%) is considerably lower, especially in rural areas. Teachers have confirmed that many students from poor or rural households rely solely on smartphones, which limits their ability to participate in online learning or complete assignments that require more advanced tools.

As a consequence of this, schools located in rural areas often face material challenges and are under-equipped with ICT, making it impossible for students to develop digital skills or compensate for the lack of digital technology at home. In Bosnia and Herzegovina, around 500 schools lack internet access, directly hindering around 14,000 students from acquiring digital competences. Additionally, research by the COI (2022) indicates that teachers in rural areas of Bosnia and Herzegovina use digital tools approximately three times less frequently than their urban counterparts. The same issue has been reported in other project countries.

Another challenge faced by rural communities is that digital transformation has led to the closure of many physical services (social welfare, financial, and administrative) in rural areas. This has left them without access to critical services due to either connectivity issues or a lack of digital literacy.

Roma, Ashkali, Egyptians

Roma, Ashkali and Egyptians have been identified in project countries as especially vulnerable and at risk of exclusion for decades. Often facing multiple disadvantages, such as unemployment, living in deprived areas, low levels of education, they are now encountering new and different barriers in the context of digitalisation. This exclusion is not solely due to a lack of access to devices or connectivity but also reflects broader issues such as limited digital literacy, linguistic barriers, and deeply entrenched prejudices. A recent report on the Digital Inclusion of Roma Communities (Roma Civil Monitor, 2024) emphasises another dimension: antigypsyism continues to influence policy decisions, resource allocation, and societal attitudes, thereby preventing meaningful engagement with digital technologies.

A survey by the EU Agency for Fundamental Rights (2020) revealed that only 43% of Roma households had internet access, compared to 87% of households across the EU. Furthermore, only 19% of Roma adults reported having basic digital skills, which contrasts sharply with over 50% of the general population. Disparities in

access to and adoption of digital technologies persist, limiting Roma individuals' ability to fully participate in the digital world and exercise their fundamental rights. Roma girls, similarly to women in rural areas, are even more affected. For example, in Kosovo, only 75% of Roma, Ashkali, and Egyptian girls use computers, compared to 90% of boys from the same communities (UNICEF, 2022). This confirms that Roma communities, not just in the WB countries but across Europe, are disproportionately affected by the digital divide.

Factors that particularly affect Roma include negative attitudes and limited support networks, which leave them discouraged from accessing technology or using the internet for work-related opportunities. Language barriers associated with self-help platforms, combined with a lack of digital literacy in Roma communities, pose another barrier. The language barrier also affects other minorities, as most countries report that e-services are rarely translated into all minority languages and that there are seldom training opportunities available in different languages.

The situation per country is described below.

Albania: The European Commission's 2024 Progress Report emphasises that a digital literacy gap and limited digital access persist, particularly among Roma, Egyptian, and rural communities. National action plans, such as the Equality, Inclusion, and Participation of Roma and Egyptians 2021–2025, aim to improve access to digital services, but implementation remains weak, with marginalised groups continuing to face barriers in accessing e-services. In 2023, the team from the organisation Walk in My Shoes observed that members of the Roma and Egyptian communities were unable to access the e-Albania platform independently.

Bosnia and Herzegovina: Roma communities are identified as highly vulnerable to digital exclusion for several reasons (material status, lack of skills). The national report also notes that, even though not formally recognised, minorities are at risk if they are not proficient in the national language, as there are no linguistic accommodations within e-services or data on their use by national minorities and their levels of satisfaction.

Kosovo: Roma, Ashkali, and Egyptian students face difficulties navigating platforms like eKosova, particularly when it comes to password recovery and administrative inefficiencies.

North Macedonia: The particularly hard-hit group is the Roma population, whose low level of digital skills and limited access to technology hinder their ability to enjoy rights and access digital services, which are gradually becoming the primary medium for enjoying these rights (healthcare, education, employment, social protection, etc.). Linguistic minorities also face barriers in accessing e-services. Some services are available in Albanian and English, but not in any other minority languages.

Serbia: There are no culturally sensitive digital education materials or support mechanisms available for linguistic minorities (assistive technologies, e-service adaptations, etc.). Although the Strategy for the Development of Digital Skills highlights the importance of

digital inclusion for vulnerable groups, including Roma communities, such support is currently lacking.

Vulnerable subgroups

Within each of the listed groups, there is also an especially vulnerable subpopulation, namely women and children.

Women are overrepresented among those who are digitally excluded, particularly in low-income countries (UNICEF, 2023), where 90% of adolescent girls and young women aged 15–24 are offline, compared with 78% of adolescent boys and young men of the same age who do not use the internet. There is also a significant skills gap: for every 100 male youth who have digital skills, only 65 female youth do, across 32 countries and territories analysed.

The UN Women Report for 2022 emphasises that in the case of women, the country context is not a crucial factor. Women in seemingly similar country contexts face very different outcomes in terms of equal access to and use of technology, and even within countries, differences are observed. Disparities in women's access to the internet vary across countries, depending on geographic distribution, education, age, and employment status. Those who are at intersections of other inequalities—class, ethnicity, urban or rural location—are especially at risk of exclusion. There is also an impact of culture, religion and other less quantifiable factors on their participation.

Children as a specific subgroup are in a similar position. While a large proportion of children and young people can access digital devices, 8% of those aged 5–15 do not have access to an internet-enabled desktop computer, laptop or netbook at home (Bowyer et al., 2021). As with women, those who already experience multiple vulnerabilities due to their socioeconomic status, ethnicity or disability are consequently at risk. There is also a persistent myth of children as digital natives that permeates media narratives, pushing children without access and skills to the margins of digital inclusion.

The situation in the DII project countries confirms the aforementioned conclusions. For example, in Bosnia and Herzegovina, according to the UN Women report (2023), women have 40% less access to digital platforms for work and education than men of the same age and education level, while data for North Macedonia show that 36% of schoolchildren lack access to computers or tablets.

In Serbia, CSOs representatives and researchers pointed out that low-income households often have to prioritise basic utilities over digital access and that, in multi-generational homes, children's digital needs are frequently overlooked. In such settings, shared devices, lack of privacy and slow connections disproportionately impact children, first affecting their education, and later their employment opportunities.

Additional considerations

Besides the factors listed above, there are other, less-researched reasons why some people struggle to integrate into the digital society. One such factor identified

in the literature is digital acceptance, which refers to people's understanding of and attitudes towards the use of digital technology. This concept encompasses awareness of technology, perceived usefulness, perceived usability and perceived trustworthiness (Nguyen, 2022). According to Lloyds Bank's 2022 Consumer Digital Index, 6.7 million (or 13%) of online users express a lack of confidence in using digital services and tools, such as financial and public services. Another study, focused specifically on medical services, reports that people with limited digital literacy are less likely to report confidence and satisfaction with remote medical consultations (Hider et al., 2023).

Closely related to confidence as a barrier to digital inclusion is motivation. Some people find that the internet is not for them or that it does not offer any personal benefit in being online. Others are discouraged by the lack of necessary support. Another demotivating factor is that the internet seems too complicated, or that people use this as a reason to mask their own abilities if they lack the skills to navigate online (French et al., 2019).

There are also significant concerns among citizens about privacy and data security, which undermine trust and limit the use of digital tools. This issue has also been observed in the project countries. For example, the lack of trust in institutions and fear of personal data misuse discourage many from using platforms like e-Albania (Institute for Democracy and Mediation, 2023; SCiDEV, 2023).

In North Macedonia, the 2024 Organisation for Economic Co-operation and Development (OECD) report highlights the absence of a robust legislative framework for digital government reforms, coupled with weak administrative capacity which undermines trust in digital services.

Research by the Organisation for Security and Co-operation in Europe (OSCE) (2023) found that 80% of Serbian citizens hold a prevailing opinion that there is a high risk personal data being compromised or misused, and they have concerns about how their personal data are handled by certain institutions and companies.

Overview of identified vulnerable groups in DII project countries

Digital exclusion is a widespread and growing phenomenon that leads to several negative impacts on individual life paths, such as poor health, inadequate income and a higher risk of marginalisation. Factors contributing to exclusion mostly overlap with those that drive social exclusion in general, but some highly specific challenges put even more people at risk. We have covered the most common vulnerable groups and risk factors in the project countries; however, within each country, there are still nuances that need to be recognised in national policies and targeted explicitly by inclusion measures.

The table below presents an overview of identified vulnerable groups and the risk factors that contribute to their vulnerability in the context of digital exclusion in the project countries.

Table 4. Overview of identified vulnerable groups per country

	Albania	Bosnia and Herzegovina	Kosovo	North Macedonia	Serbia
Vulnerable groups	– Older persons – Persons with disabilities – Rural population – Low-income, unemployed individuals & NEETs – Roma & Egyptian minorities – Transgender individuals – Women & girls – Low-educated population – Children cared for by older adults – Smallholder farmers	– Persons with disabilities – Older persons – Rural population – Low-income & unemployed individuals – Women & girls – Children & youth – Unregistered migrants – Youth in institutional care	– Roma, Ashkali, & Egyptian communities – Older adults – Persons with disabilities – Rural population – Socioeconomically disadvantaged groups	– Persons with disabilities – Older persons – Socioeconomically disadvantaged groups – Rural population – Roma minority – Children & youth in institutional care – Low-income & unemployed individuals – Low-educated population	– Older persons – Persons with disabilities – Rural population – Low-income & unemployed individuals – Roma & other ethnic minorities
Main risk factors	– Limited digital skills & digital learning opportunities – Inaccessible digital platforms – Limited assistive technologies – Poor infrastructure – Discrimination – Lack of support for digital access & learning – Low SES & inability to afford equipment	– Limited assistive technologies & digital equipment in schools – Inaccessible digital platforms – Lack of tailored training opportunities – Low digital literacy & limited experience with technology – Multiple discrimination – Absence of targeted support measures – Inadequate infrastructure & geographic distance from educational/ support centres – Unequal access to internet connectivity – Low SES & inability to afford equipment	– Limited digital skills – Inadequate infrastructure – Difficulties in using digital platforms – Lack of accessible digital services – High cost of assistive technology – Limited access to reliable broadband internet – Limited access to modern digital tools – Low SES & inability to afford equipment	– Limited access to assistive technologies – Inaccessible digital platforms – Limited digital skills – Low SES & inability to afford equipment – Lack of ICT in school – Poor ICT infrastructure & lack of internet access – Multiple discrimination	– Low SES & inability to afford equipment – Low digital skills – Poor ICT infrastructure & lack of internet access – Limited access to assistive technologies – Discrimination & lack of culturally sensitive measures

4. PILLARS OF DIGITAL INCLUSION

Based on project country reports and other sources consulted for this report, several key takeaways have emerged on how to support digital inclusion. Although solutions vary, the most promising policies follow the same principles, reflecting a broad convergence in perspectives and priorities among diverse stakeholders. This chapter discusses the main pillars of digital inclusion and highlights sound and promising practices and policies from the project countries.

National strategies

In line with European values, the digital environment should enable all citizens to make full use of digital technologies and live in a society where geographical distance matters less, so that every person can benefit from digitalisation in their daily activities—ranging from work, learning, to enjoying culture or leisure activities—but also in their interactions with governments and participation in democratic processes. Although this may seem like a very straightforward principle, it is not easy for governments with a high degree of fragmentation and compartmentalisation between sectors to promote a coherent and sustainable digital transformation.

Having a quality strategic framework is an objective, but a precondition for this is the development of policies based on data and evidence. As presented in the section on monitoring and evaluation and in the discussion on available data, this remains an area for improvement across all DII project countries.

The monitoring report on the Declaration on Digital Rights (2025) reveals that most activity across the EU27 Member States is associated with two main areas of the Declaration: 'Solidarity and inclusion', and 'Safety, security and empowerment'—more specifically in the areas of 'Digital education, training and skills', and 'A protected, safe and secure digital environment'. Fewer digital rights initiatives were identified in the areas of 'Freedom of choice', 'Participation in the digital public space' and 'Sustainability' (European Commission, 2025). Based on country reports, we can confirm a similar trend in the project countries. The examples below illustrate how these principles have been integrated across different documents in the project countries.

The principle of **Solidarity and inclusion** is identified in all countries**.** A typical example is North Macedonia, where, based on the National Development Strategy (2024-2044), digital solutions are viewed as "tools that enable inclusion", particularly in essential public services such as healthcare, education, social protection, child protection and infrastructure. In Serbia, the recently expired Strategy for the Development of Digital Skills (2020–2024) outlined digital inclusion as a means of empowering all citizens, especially marginalised groups, to participate actively in society and contribute to the development of a knowledge-based economy within the framework of lifelong learning. Similar references

can be found in all other countries, but in different documents, including strategies related to digitalisation, national development and the Sustainable Development Goals (such as in Bosnia and Herzegovina), among others. What is often criticised is that certain specific standards—such as those related to accessibility—are not integrated into any binding document (e.g. in Serbia, the Web Content Accessibility Guidelines 2.1).

This appears to be an issue within the EU as well, where the existence of standards does not guarantee compliance. According to the Digital Trust Index, 94% of European websites do not comply with mandatory accessibility regulations for people with disabilities. Websites frequently fail to meet two critical criteria for making their content legible to people with visual impairments. The most prevalent issue is incorrect colour contrast between text and background, while many websites lack descriptions for links (63% of websites), images (33%) and buttons (18%).[6] This was confirmed by stakeholders in project countries, particularly in Serbia. People with disabilities may also face barriers with the newly introduced ETIAS system.[7] Representatives of persons with disabilities from Serbia warned the public that the technical requirements of the system (e.g. taking fingerprints) are not accessible to many people with disabilities. They also noted that there is insufficient information on how the system will accommodate people with disabilities in future travel under ETIAS. The Association of Travel Agencies stated that there are no instructions provided by the EU on how to address these issues.[8]

The principles of **Freedom of Choice** and **Safety and Security** are complementary and partially overlap. Most countries have recognised the need for strong procedures and detailed legislation to implement them. What is challenging in this area is that we are still learning about the risks associated with digital development and transformation. Therefore, legislation surrounding digital safety in each country is constantly evolving. Complementary measures to legislation and enforcement mechanisms should aim to raise awareness about digital safety and cyber protection through education and training, which are essential for effectively addressing safety issues. This appears to be the emerging policy in all countries, yet it remains to be prioritised.

Some examples from project countries are listed below.

The Albanian National Cybersecurity Strategy 2025–2030 (yet to be published) emphasises citizen empowerment through education, awareness-raising, and the development of capacity to engage safely with digital technologies.

In Kosovo, the recent Law on Cybersecurity introduces robust mechanisms for cybersecurity and digital resilience, and establishes the Cybersecurity Agency as the coordinating body. The Digital Agenda of Kosovo 2030

6 https://www.digitaltrustindex.eu/

7 ETIAS is the new travel authorisation for visa-exempt travellers to enter 30 European countries. https://travel-europe.europa.eu/etias

8 https://n1info.rs/vesti/da-li-je-novi-evropski-sistem-ulazaka-prilagodjen-osobama-sa-invaliditetom/

identifies the establishment of a sustainable cybersecurity ecosystem as one of its priorities, as does the e-Government Strategy of Kosovo 2023–2027.

The Draft Law on Information Security provides a framework for cybersecurity and user privacy in North Macedonia, but has remained unadopted since 2019. Nevertheless, the Strategy for Cyber Security (2025–2028) integrates the National Council for Cyber Security into the National Council for Digital Transformation (2025–2027) and sets up a dedicated cyber security sector within the Ministry of Digitalisation.

In Serbia, a Strategy for the Development of the Information Society and Information Security (2021–2026) has been implemented, promoting e-government, digital skills, and cybersecurity, particularly among marginalised groups.

Participation appears to lag behind the aforementioned principles, mirroring the situation across the EU. This principle refers to the belief that citizens should have access to a trustworthy, diverse, and multilingual online environment and should know who owns or controls the services they use. Digital platforms should enable individuals to exercise freedom of expression, engage in discussions, challenge ideas, and voice dissent, all while having full confidence in their safety.

In previous chapters, it was highlighted that citizens rarely use digital technologies for activism or participation in democratic processes, and they do not feel entirely safe sharing and engaging through digital platforms. For many, barriers to access have resulted in a loss of trust in e-services, leaving them on the margins. For example, in North Macedonia, persons with disabilities continue to face barriers to political participation, including inaccessible voting stations and a lack of disability-friendly election materials. Thus, the lack of digital skills is recognised as a barrier to participation (European Commission, 2023).

In Albania, data also show that young people are less interested in participation for similar reasons (27.6% of youth reduced their online participation due to privacy and safety concerns (SCiDEV, 2023)). There are few examples of measures aimed at increasing participation and the use of e-services by minority groups (such as through multilingual digital environments), which limits their opportunities for representation. Again, insight from Albania provides a good illustration of why this is important: "*Policies are developed and implemented with minimal community consultation or involvement of civil society organisations, even though they often have the most direct contact with underserved populations. This lack of participatory design results in services that may be technically functional but inaccessible to many users.*"

All project countries reported similar findings. Stakeholders across the countries recognise that this area requires further development, and some progress is already visible at the policy level.

In addition, it should be noted that in Albania, the strongest advocates for participatory policymaking are CSOs. Their representatives view civil society as uniquely positioned to monitor policy, hold institutions ac-

countable and raise awareness about the risks of digital exclusion. They also advocate for stronger community representation in policymaking processes and provide capacity building for those communities.

Sustainability and the green transition have been a trending topic for governments in the region in recent decades, and all project countries are committed to the Green Agenda for the Western Balkans. In addition to other obligations, this means they are expected to develop technologies that reduce environmental impact and support a sustainable future. As this report primarily focuses on inclusion and challenges for vulnerable groups, no detailed data were collected on green technologies. However, we can observe that countries are addressing these issues in their legislation.

There are also references to CSO-led initiatives that emphasise sustainability and environmental awareness in relation to digital technologies, supporting the reuse of equipment and donations. These types of initiatives are likely more frequent but have limited coverage and duration, which is a problem identified with most project-based actions.

In Albania, the National Plan for the Sustainable Development of Digital Infrastructure 2020–2025 is in place; however, the country report notes that Albania lacks explicit climate-friendly digital strategies and has a limited focus on digital sustainability.

In Bosnia and Herzegovina, the Go Digital in the Western Balkans programme aims to drive innovation, competitiveness and sustainable growth in the private sector. It provides funding to small and medium enterprises (SMEs) to boost not only digital transition but also green economy transition and inclusive economic growth, ensuring women-led SMEs have equitable access to finance.

In North Macedonia, the National Development Strategy 2024–2044 envisions resource allocation, particularly in areas such as green infrastructure and digital transformation. Since 2016, the ongoing initiative Donate a Computer has donated over 4,000 computers to schools, raised awareness about digital inequality, and promoted sustainability through the reuse of devices. Despite its success, public institutions have not reached out to potentially partner or scale up this successful initiative.

Coherent digital government

Cross-government architecture and collaboration are crucial for the development of successful policies and programmes.

As presented in the **Governance** section of this report, digital inclusion is recognised as a multisectoral, interministerial topic in all countries. However, stakeholders across the participating countries have noted a lack of coherence and coordination. Therefore, this section examines intersectoral cooperation in countries and highlights some elements that could benefit national structures.

The first step towards a coherent government is overcoming the compartmentalisation of public institutions. Collaboration between agencies responsible for driving digitalisation and those overseeing key policy areas—such as education, healthcare, or economic development—is crucial. A prerequisite for this, although it might sound contradictory, is a clear definition of roles, responsibilities, and jurisdictions. Only then can intersections and overlaps be identified, ensuring coordinated actions among government actors. Digital transformation should be recognised as one of the key intersections. Integrating digital considerations into policy formulation and implementation ensures that all actors are attuned to how their work interacts with the broader digital agenda. Ultimately, all these policy formulations must be aligned with the principles of digital inclusion outlined previously.

Although digitisation in project countries is seen as an intersectoral priority, digital inclusion is more often addressed at the sectoral level, either through government-led initiatives or frequently through projects and donor-funded initiatives. One reason might be the absence of an overarching strategy for digital inclusion per se. Instead, each sector is left to recognise and remove barriers for vulnerable groups.

In the text below, the main conclusions and positive aspects of intragovernmental coherence from country reports are presented.

Albania: Institutional engagement across various sectors, including cybersecurity, education, and public administration, has increased, particularly in areas of shared interest such as digital safety and infrastructure development. However, overlapping mandates, fragmented resources and weak interagency coordination continue to pose challenges. The absence of a formal coordination mechanism prevents consistent alignment of efforts across sectors.

Bosnia and Herzegovina: Initiatives such as the Digital Europe programme and the establishment of the Intersectoral Advisory Board show progress in connecting sectors. However, challenges persist in implementation, including inconsistent healthcare systems and unequal access to technology across different regions. Intersectoral cooperation is not institutionalised and remains limited to ad hoc initiatives and externally funded projects. There is no formal framework to ensure horizontal cooperation between the education, health, social protection and employment sectors, nor is there a coordinating body to oversee cross-sectoral activities.

Kosovo: A solid foundation for a coherent government is outlined in the Digital Agenda of Kosovo 2030, and a high-level commission exists to coordinate digital transformation. The e-Government Strategy of Kosovo 2023–2027, a strategic framework designed to accelerate the digital transformation of public administration in Kosovo, has well-defined goals related to governance, enhancing e-government coordination and management, and establishing a unified, interoperable 'whole-of-government' enterprise architecture. Public officials, though, emphasise that there is still much work to be done in these areas. Although several sec-

tors—education, economy, health, and civil society—are independently implementing initiatives to improve access and digital competences, these efforts often lack coordination and mutual alignment.

North Macedonia: The Ministry of Digital Transformation has the potential to centralise the issue of digital inclusion and design a systemic approach to creating and monitoring related policies, finances, and impact. For the time being, initiatives from the government, private sector, and civil society lack strong coordination and systemic integration across sectors. Significant barriers to effective intersectoral collaboration, such as mistrust and a lack of data-sharing between institutions, hinder interoperability and burden citizens with redundant processes.

Serbia: The Strategy for the Development of Digital Skills envisages the establishment of local coalitions for the development of digital skills and the creation of a professional body/ coalition for digital skills—comprising representatives from the business sector, academia, public sector, trade unions and relevant decision makers—aimed at identifying the needs for digital skills, exchanging information and good practices, developing models to engage employers in the creation and development of study programmes, etc. In the absence of these bodies, actions remain fragmented, and the implementation of measures dedicated to digital inclusion is hindered by the inconsistent application of existing frameworks at the local level and the lack of interoperable data systems among key institutions.

Non-governmental actors (CSOs, academia, private sector)

The power of **multi-stakeholder collaboration** across government, businesses, and civil society to drive effective and sustainable digital inclusion efforts is significantly greater than the isolated contribution of any single actor. As partially addressed in this report and based on the country reports, this potential remains underutilised. The CSO sector primarily acts as a supplementary mechanism when policy implementation fails or when policy design does not adequately address the problem. There is some cooperation with the private sector, primarily involving telecommunication providers and digital technology developers, but without a clear strategy or sustainability in the approach. Lastly, as evidenced by national reports, academic research on digital inclusion is scarce and only emerging; consequently, the already weak link between academia and policymaking is almost non-existent in this field.

Research and innovation in the world of digital technology are progressing at a rapid pace, but this swift development often leaves some people behind. The benefits of frontier technologies are not distributed equally among developed and developing countries. Developed countries are seizing most of the opportunities presented by the technological revolution unleashed by Industry 4.0, AI, and green technologies, while developing countries lag years behind (UNDP, 2024b). However, all countries are at risk of being left behind if

companies are the sole driver of this development and the principle of 'people at the centre' is abandoned.

In the text below, we present selected examples of activities that demonstrate how CSOs and other stakeholders are positively contributing to digital inclusion in various countries. It is important to note that even the best practices and most successful projects have limited impact due to unsustainability and limited coverage. These examples should serve as policy pointers and a litmus test for identifying areas that need improvement at the national level and within policy frameworks.

Albania: CSOs contribute to digital inclusion through initiatives focused on digital literacy, civic engagement, the promotion of digital rights, and access to e-Albania. The most important activities they implement are workshops, training programmes, and awareness-raising campaigns, enhancing digital skills, particularly among youth, marginalised groups, and CSO actors themselves (organisations such as SCiDEV, Epoka e Re Youth Centre, the National Resource Centre for Civil Society and the Institute for Democracy and Mediation). The Walk in My Shoes organisation offers direct support with e-Albania services, especially to Roma and Egyptian families. The biggest concerns expressed by CSOs include a vague definition of digital inclusion, a top-down approach to policymaking, a lack of transparency, and inadequate monitoring and evaluation of digital services or policies.

Bosnia and Herzegovina: Civil society organisations (CSOs) are actively involved in digital inclusion, although data on specific initiatives are scarce. They conduct training, provide support and advocate for the inclusion of vulnerable groups in the digital society. Importantly, they provide direct community support through workshops, mentorship programmes, and counselling. UNICEF and ITU's Giga Initiative connects schools to the internet through a multisectoral approach, while projects like Stop and Listen target digital inclusion for marginalised groups via multisectoral support. Organisations point out that government policies lack clearly defined operational dimensions, often forcing them to "follow the system and fix it at the same time". There is also a lack of CSO involvement in the planning and evaluation of public policies, along with systemic cooperation issues, limited funding, and project instability—all of which pose significant barriers to reaching all target groups.

Kosovo: CSOs in Kosovo have become increasingly active in the field of digital inclusion, implementing targeted interventions that support marginalised groups, advocate for digital equity, and complement public efforts through community-based education and skills development (organisations such as Kosovo Informatics Society (SHPIK), Kosova Education Centre (KEC), Kosova Centre for Digital Education (KCDE) and the Foundation House (formerly IPKO Foundation)). Despite their proactive role, CSO representatives have expressed concern about the fragmented nature of public digital inclusion policies and the insufficient attention paid to vulnerable populations, including rural residents, older citizens, and ethnic minorities. While donor funding

has enabled impactful programming, the sustainability of these initiatives remains dependent on more structured collaboration with state institutions and long-term public investment in digital equity.

North Macedonia: The CSO sector in North Macedonia is highly active in promoting digital inclusion through specific organisations and targeted projects. Initiatives such as Donate a Computer (Doniraj kompjuter) aim to provide IT equipment to disadvantaged communities. Metamorphosis, a proactive CSO, has contributed to policy advocacy by providing detailed public input on the National ICT Strategy during its consultation phase. Additionally, UNICEF, in cooperation with national partners, has supported several initiatives. There are also several projects aimed particularly at the rural population, such as the Young Men's Christian Association Bitola, which launched a Digital Community Hub to tackle digital education challenges among rural populations. In addition, the Media Literacy for Rural Youth project, led by the Youth Cultural Centre – Bitola, focuses on improving media literacy among rural youth. Unfortunately, successful CSO initiatives rarely receive sustained support and often need to be discontinued, despite having filled crucial gaps in digital inclusion. There are notable inefficiencies in cross-sectoral coordination, a lack of continuity, and the absence of a stable mechanism for public-CSO sector collaboration.

Serbia: CSOs in Serbia are actively engaged in enhancing digital literacy and improving access to technology for older people, women, persons with disabilities, youth, and rural populations through a range of projects, programmes, and initiatives. Bridging the Digital Divide for the Most Vulnerable Children (2020-2023), implemented in partnership with UNICEF, the Ministry of Education, and the Centre for Education Policy, established 30 Learning Clubs and Digital Technology Libraries in 30 schools with a high share of vulnerable students. The association Halfway There provides training and workshops on digital skills for elderly and disabled persons. The Support for Girl Programmers project—implemented by IRIDA and supported by Helvetas Swiss Intercooperation, Civic Initiatives, and Children's Innovation Centre—aimed to motivate, encourage and empower girls to explore different areas of IT, to learn, conduct research and develop their talents and skills. The national report highlights the same issues as in other countries, including sustainability and limited coverage of CSO initiatives. Additionally, it notes that there is no feedback loop between their interventions and public policies, resulting in insufficient use of insights into local conditions and community-specific needs in policy design.

The private sector can play a crucial role in enabling digital inclusion by supporting access for underserved populations, adopting inclusive business models, driving innovative solutions, and empowering vulnerable groups to participate in the digital economy. In project countries, the involvement of tech companies or start-ups exists but is not being used to its full potential. The most common partnerships are between telecommunication service providers and the government or organ-

isations that provide affordable access to the internet or devices to vulnerable groups (in Serbia, UNICEF co-operates with Yettel and Telekom). A similar approach is deemed necessary according to national reports, but it has not been systematically introduced in Kosovo, North Macedonia, and Bosnia and Herzegovina.

Both the private sector and citizens, especially vulnerable groups, can benefit from greater private sector involvement. Companies can advance digital inclusion by implementing initiatives for underserved communities and by incorporating inclusive products and services into their business strategies. With strict ethical standards, governments can ensure that these products and services have a positive impact on equity. As mentioned in previous sections, safety and ethical standards are crucial for public-private partnerships, as citizens often exhibit a certain level of mistrust when private providers gain access to their personal information.

Some companies have recognised this, as evidenced by examples from project countries. At the same time, some major actors, such as Microsoft, are present in Serbia, yet a Serbian-language screen reader for Windows systems is still unavailable, unlike in other countries, such as Croatia. Unfortunately, some of these partnerships face the same challenges as CSO initiatives—they are not sustainable enough and have limited scope. A few examples from project countries are presented below.

Albania: The joint project of the International Labour Organisation, FAO, and the International Telecommunication Union (ITU) is the Digital Agriculture and Rural Transformation programme, which foresees targeted initiatives to support vulnerable groups, such as smallholder farmers, by improving their digital capacities by 2027. An especially important component is a national skill needs assessment, which identifies gaps and informs the development of inclusive training programmes. The European Bank for Reconstruction and Development supports small-scale innovation and public-private partnerships related to ICT and digital skills. GIZ (Germany) provides technical assistance and training in digital competences, especially in vocational education and employment services. The Albanian-American Development Foundation has introduced an ICT curriculum to elementary education in Albania to help narrow the digital divide in the country.

Bosnia and Herzegovina: Private e-health services have been developed in cooperation with entities such as Doktor Online, offering video consultations and advice. The Federation of BiH's Small Business Development Strategy emphasises the importance of supporting vulnerable groups in the IT sector, including unemployed women and women with disabilities.

Kosovo: Organisations such as Open Data Kosovo and Innovation Centre Kosovo contribute to fostering digital entrepreneurship and transparency in governance through civic-tech applications and support for ICT start-ups. These actors focus primarily on systemic transformation and innovation.

North Macedonia: The private sector's contributions, such as Brainster's deferred tuition voucher model

(Study Now, Pay Later) for IT education, show promise but lack systemic integration with public strategies, underscoring the need for stronger public-private partnerships.

Serbia: Serbia lacks private sector initiatives that promote the development of innovative services and products to enhance digital inclusion, as most existing efforts are commercially driven or support entrepreneurial initiatives. There are numerous private providers of digital skills training courses, but apart from those implemented as part of the project, they are rarely customised for vulnerable groups. Semos Education Serbia, in partnership with Help, participates in the RECONOMY Programme, which aims to improve employment opportunities for young people, women, and other unemployed individuals by aligning labour market supply and demand inclusively and sustainably. Within this framework, Semos has expanded its offer to include training for individual learning and upskilling in the emerging IT and BPO occupations.

Finally, **innovative solutions** are emerging from various sectors to address and remove barriers that certain groups face. There are still many resources to be tapped into, like the potential of AI applications for digital inclusion (such as in translation and educational tools), industry innovations to overcome barriers related to access and affordability of connectivity and hardware, and digital tools to map and match needs to resources and individual interests to opportunities more effectively and at scale.

In project countries, this remains a significant area for further development, but some solutions are emerging through partnerships between academic/research institutions, companies, and other stakeholders. For instance, in North Macedonia, an augmentative and alternative communication (AAC) tool is designed to assist children with communication difficulties. This project was a collaborative effort involving the Faculty of Electrical Engineering and Information Technologies (FEEIT), the Association for Assistive Technology – Open the Windows, the Institute of the Macedonian Language – Krste Petkov Misirkov, and Melon Inc., with support from the UNICEF office in North Macedonia. In Kosovo, start-up ecosystems and ICT training centres, such as innovation centres and ICT hubs, are emerging as important drivers of digital inclusion by providing accessible training and networking opportunities for youth and entrepreneurs. In Serbia, there is ongoing collaboration between academia and industry in the development of digital technologies—for example, the University of Belgrade works with tech companies to develop software that improves accessibility for people with disabilities, such as voice control applications.

A multistakeholder approach to digital inclusion can expand citizens' empowerment, increase civic capacity, improve the evidence base for policymaking, reduce implementation costs, and leverage resource networks and ecosystems for innovation in policy making and service delivery. It also enables shared ownership, roles, and responsibilities between the public sector and citizens or businesses in creating and implementing pol-

icies, programmes and services. All project countries appear to be aware of this potential and exhibit an adequate policy orientation. What seems to be missing are implementation mechanisms, structure, and, more importantly, clear standards that all actors must follow to use this potential effectively in ensuring digital inclusion.

Infrastructure

Infrastructure is crucial for ensuring digital inclusion, especially in addressing the geographic divide. However, devices and services must also be affordable to avoid widening the economic divide. This is one way to look at investment in infrastructure, but there is also another equally important reason for investing in digital technologies. Governments should support the initial investment required for infrastructure but once built, such infrastructure creates opportunities for innovation both within and beyond the public sector (e.g. the delivery of new public services or the emergence of new digital solutions). When discussing infrastructure, key aspects include availability, speed, latency, bandwidth, coverage, network, and energy efficiency of internet connectivity within a territory. A good level of coverage and the development of ICT/digital infrastructures provide the foundation for access to and delivery of digital public services across the country, enabling greater digital inclusion. Suboptimal coverage and underdeveloped ICT/digital infrastructure are likely to hinder access to and delivery of digital public services, risking the widening of the digital divide between areas with fair connectivity and those with poor connectivity (OECD, 2021).

In project countries, there is a strong policy commitment to ensuring digital infrastructure. However, questions raised in reports examine how that commitment is demonstrated in practice.

The first issue relevant to digital inclusion is whether internet connectivity is made affordable and accessible across the country and to all segments of the population, thereby ensuring digital inclusion. It is evident from previous chapters that all project countries identify the rural-urban divide as a significant indicator of inequity in access to digital infrastructure and highlight the substantial impact of low material status on digital inclusion. Based on this, we can conclude that there is room for improvement in this area. The next aspect to analyse is whether there is political commitment and support to promote the long-term development of ICT/digital infrastructure and whether there is a strategy to improve digital infrastructure through sustained investments and innovation with the participation of different stakeholders (private sector, donors, etc.). In all countries, we can find positive examples of such commitment, with some remarks on the actual implementation usually coming from users or stakeholders who are more aware of policy implementation challenges.

Namely, in Albania, the Intersectoral Strategy for the Digital Agenda 2022–2026 and the National Plan for the Sustainable Development of Digital Infrastruc-

ture (Broadband Plan) 2020–2025 demonstrate the Government's full political commitment to ensuring digital infrastructure in all regions, reducing territorial disparities, encouraging infrastructure investment through public-private partnerships and encouraging infrastructure sharing among providers. Financial priorities align with this commitment. The most significant national investments tied to digital inclusion include broadband infrastructure, digital public services, GovTech, cybersecurity capacity and digital education. A significant investment is committed to the Broadband Plan, with funding sourced from the state budget, EU IPA funds and the Western Balkans Investment Framework. This investment prioritises rural and underserved areas, aiming to meet EU Gigabit Society targets. Nevertheless, delays in broadband deployment and gaps in accessibility programmes remain key issues.

Bosnia and Herzegovina, through participation in programmes like Digital Europe and strategies such as the Federation of Bosnia and Herzegovina Small Business Development Strategy and the Spatial Data Infrastructure Strategy, has a policy framework in place that emphasises infrastructure and e-services. The missing element, as perceived by stakeholders, is that measures for vulnerable groups remain undefined or insufficient. Experiences from the healthcare sector further highlight the fragmentation of digital infrastructure across cantons – some cantons have no digital systems at all, while others use them selectively and face frequent technical issues.

National policies in Kosovo broadly reference digital inclusion, highlighting general objectives related to infrastructure and digital transformation. However, specific regulations still need to be developed to ensure affordable ICT. The Law on Reducing Deployment Costs for High-Speed Networks aims to facilitate affordable broadband through shared infrastructure and streamlined procedures. Both the Digital Agenda for Kosovo 2030 and the E-Government Strategy prioritise digital infrastructure and promote public-private investments and innovation through public–private partnerships. The Kosovo Digital Economy Project (EUR 20.7 million), financed by a World Bank loan, has explicitly allocated EUR 18.6 million to expand broadband access and digital skills training in rural and underserved areas. However, support for marginalised groups and remote communities is insufficiently addressed.

North Macedonia's participation in the EU's Digital Europe Programme opened avenues for funding aimed at enhancing digital infrastructure, and the country's strategic documents do address the issues of uneven digital infrastructure. For instance, the Law on Electronic Communications (2022, amended in 2024) regulates the electronic communications sector, ensures affordable digital access, expands broadband coverage, and promotes universal service. Nevertheless, gaps persist, particularly in education (schools are not sufficiently equipped) and in rural areas. Hence, policies implemented in cooperation with private actors, such as Telekom or other providers, are necessary (e.g. affordable internet plans, support hubs).

Serbia's Strategy for the Development of the Electronic Communications System (2024–2027) focuses on expanding equitable broadband infrastructure, with particular emphasis on rural areas and those with limited connectivity. Serbia has also implemented several large-scale programmes, such as the Development of Broadband Communication Infrastructure in Rural Areas of the Republic of Serbia (2024–2026), which aims to provide internet connections to approximately 880 schools, public institutions, local institutions and around 152,000 households. It is also noted that Serbia's Reform Agenda 2024–2027, supported by the EU's Reform and Growth Facility, includes investments in digital infrastructure, the implementation of measures to improve digital literacy and inclusion and support for digital transformation in public services. However, implementation of these measures remains insufficient, as gaps in access persist.

Digital skills development for all

The level of digital skills within the population is a critical factor to consider when developing policies to meet their needs. To ensure that the digital transformation of the public sector is equitable, inclusive, and sustainable, governments need to invest in building the digital skills of the population—often referred to as 21st-century skills.

Throughout this report, digital skills have emerged as the most significant factor in addressing digital exclusion. Even with access to affordable digital technologies and services, people lacking skills are still fully or partially excluded—not only from digital society but also from exercising their fundamental rights. Therefore, where levels of digitalisation in the population vary, closing the skills gap through targeted education, training, and outreach programmes should be a priority, followed by consistent measuring and monitoring of outcomes to ensure equitable, inclusive, and sustainable development.

At the EU policy level, the Digital Competence Framework for Citizens identifies the key components of digital competence across five areas and 21 specific competences, while the Path to the Digital Decade Policy Programme sets out the EU's objective of developing basic and advanced digital skills and competences to guide the digital transformation (European Parliament, 2022).

From the section of the report that deals with data, it can be concluded that in the project countries, digital skills development is progressing, but it remains far from satisfactory. Governments are aware of this challenge, and all relevant strategic documents emphasise the importance of skills development. National stakeholders, however, are unanimous and very clear that these policies are not fully effective in closing the skills gap. There are still entire population groups left without the opportunity to develop even basic skills, while those targeted with measures face significant barriers. Several questions need to be asked to identify the reasons behind this persistent gap.

Bearing this in mind, the starting point is to identify the key digital skills gaps and determine whether a

common definition and understanding of digital skills already exist. Based on national reports, the answer is affirmative for the general population; however, a tailored needs assessment is required for vulnerable groups, one that is more sensitive to their specific circumstances. Another consideration is whether governments are prepared and capable of reforming education and training programmes, along with compensation and benefits packages, to reach a broader population and create more equitable opportunities. In the context of vulnerable groups, do existing training and learning opportunities extend to non-formal education and flexible learning? Is it possible to connect from anywhere and on any type of device to access a variety of learning materials?

Based on the findings of national reports, there is a political will in all the project countries to work on more diverse education and training. Regarding formal education, each country has introduced a subject devoted specifically to ICT and digital skills, as well as opportunities for lifelong learning in this area. However, equipment shortages and infrastructural challenges persist at all levels. Moreover, most initiatives and efforts to increase access to digital development opportunities through education, training, and outreach programmes for populations with lower levels of digital skills are project-based rather than systemic.

Building on the previous inclusion enablers, the text below presents selected policies and programmes implemented by project countries, along with stakeholders' perspectives on this matter.

Albania: Albania's Education Strategy 2021–2026 incorporates digital competences but lacks a structured certification system, such as the European Digital Skills Framework. The Digital Agriculture and Rural Transformation programme is exemplary, delivering targeted digital skills training to farmers, public officials and vocational education students, and is grounded in participatory design. This approach incorporates surveys, interviews, and workshops to tailor interventions to users' needs. Civil society initiatives, such as community-based digital skills training and inclusive awareness campaigns, have been effective when implemented in collaboration with local governments and national agencies. However, stakeholders note that digital literacy programmes remain insufficient, particularly for vulnerable groups. There is a lack of sustained, community-based digital education, especially among older adults and marginalised communities, which highlights the need for accessible educational content and methodologies.

Bosnia and Herzegovina: Education ministries at the entity and cantonal levels manage digital skills development through curriculum reform and educational planning. Although not always explicitly defined as educational goals across curricula, some initiatives integrate digital skills into teaching, such as IT and programming classes in primary and secondary schools. Employment institutions and organisations offer retraining and upskilling programmes, including basic ICT training, indicating initial institutional support for developing digital skills. According to stakeholders,

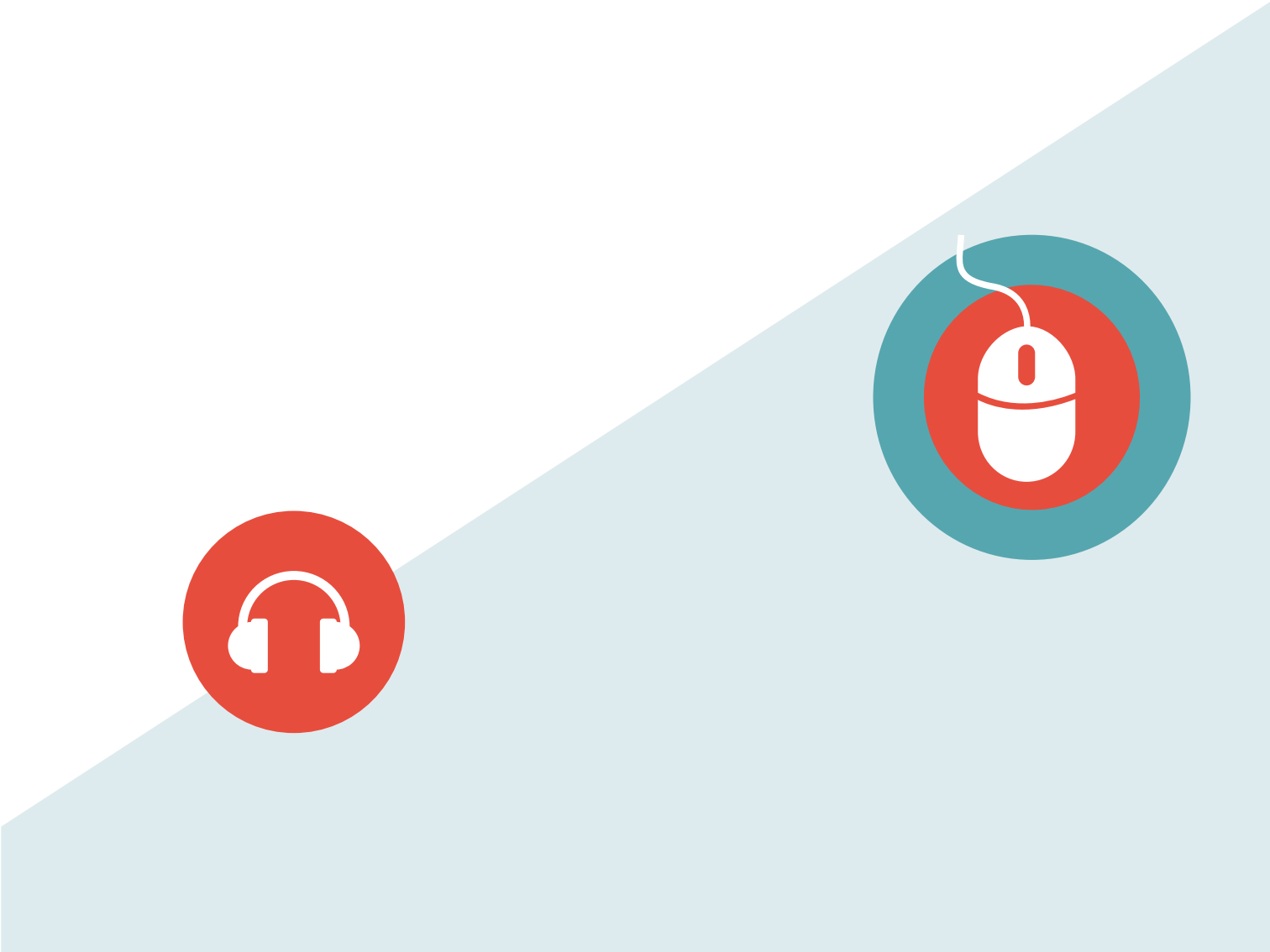
the civil sector compensates for what the system fails to provide—for example, UNICEF's distance learning programme, rural women's training (COI Step by Step, DUGA), and local initiatives such as living libraries.

Kosovo: The most important strategies in this area prioritise enhancing digital skills. Public officials and CSO representatives emphasised that existing legislation lacks sufficient focus on developing digital skills and targeted support for vulnerable groups; however, there are some large-scale programmes and allocations from the national budget for digital skills development. The Ministry of Education has dedicated EUR 15 million specifically for digital equipment in pre-university education, directly promoting digital inclusion, but stakeholders provided examples of why these funds have remained largely unspent, despite identified needs at the school level. During the COVID-19 pandemic, 2,500 teachers received training in basic digital skills, facilitating the transition to remote and blended learning. This should be a regular priority in teacher training.

North Macedonia: The National Youth Strategy (2023-2027) includes provisions for enhancing digital skills among young people, ensuring their inclusion in the digital economy. The National Strategy for Employment (2021–2027) includes preparing a concept for introducing digital skills in primary and secondary schools, widening digital skills training offerings for adults, and introducing specialised programmes to enhance digital competences among workers. The National Development Strategy 2024–2044 emphasises improving digital access for rural and low-income populations, aiming to reduce the digital skills gap as part of the EU Digital Decade targets. A challenge to the effectiveness of all implemented measures is the lack of an established feedback system for vulnerable users. Additionally, digital skills initiatives are often too generic to meet the specific needs of individuals with disabilities or rural populations. Although initiatives already exist to bridge the skills gap in ICT, the weak implementation of the legislative framework has led the UNDP to recommend an initiative called the Digital Skills Development Strategy. This initiative aims to enhance ICT accessibility and develop digital skills, particularly for marginalised communities.

Serbia: Strategy for the Development of Digital Skills (2020–2024) has expired, but a new one on Digital Education is currently being drafted. The Law on the Fundamentals of the Education System (2017, amended in 2025) provides for the integration of digital skills into teaching and learning, listing digital competence among the key competences. The Ministry of Labour, Employment, Veteran and Social Affairs (MoLEVSA) supports programmes such as IT retraining for persons with disabilities and digital skills development through the DI-MARC project. The project Caravan of Digital Skills, Literacy and Safety–Digital Expedition: Link for All was implemented from 2021 to 2023 in partnership with MoIT, MoLEVSA, the Office for Information Technologies and eGovernment, UNDP, USAID, and the organisation Propulsion. The goal of this project was to provide all interested cit-

izens—from the youngest to Generation Z and their parents, and to the oldest citizens who may not be familiar with electronic services—with the opportunity to become acquainted with key digital skills of the 21st century. Some initiatives are community-based digital skills training programmes delivered through libraries, schools, and adult education centres. These programmes target disadvantaged groups and are often linked to social protection and employment activation measures, enabling broader outreach and impact. Others, where CSOs serve as training providers, typically have a smaller scope and a more individualised approach.



5. KEY RECOMMENDATIONS

Given the situation outlined above, it can be concluded that there is a consensus among the project countries on key policy recommendations at the system level. Specifically, certain fundamental elements require attention in all countries.

At the same time, recommendations for specific vulnerable groups have nuances that reflect their respective contexts.

Key recommendation:

All countries should strive to develop a unified digital inclusion framework aligned with EU standards, ensuring that inclusion is integrated into all aspects of digital transformation.

That framework should ensure:

- Clear, unified and comprehensive definition of digital inclusion, covering all levels (access, skills and benefits).
- A coherent strategic framework and intersectoral policy coordination.
- Sustainable, transparent and efficient financing of digital inclusion policies.
- Participatory policy development and involvement of various sectors and stakeholders.
- Provision of training seminars across different groups to adopt new digital technologies and utilize them for the improvement of their quality of life and professional development
- A monitoring and evaluation framework that includes regularly updated, disaggregated data on access, use and skills across all vulnerable groups.

Specific recommendations for inclusive policies

1. Affordable connections and devices

As discussed throughout this report, digital inclusion does not end with providing access to digital technologies, but infrastructure is one of the fundamental enablers. Addressing inequalities in technology access is a policy priority in all project countries, since there are multiple reported gaps in access: geographical, socio-economic, age and even gender. Physical access to hardware and connectivity does not guarantee consistent engagement. Sufficient and sustained access to affordable and meaningful connectivity, as well as ownership of devices, is the only truly inclusive policy. The costs and complexities of ensuring devices and connections nationwide pose formidable challenges, particularly for low-income communities, affecting not only individuals but also governments. Therefore, each country must develop special schemes or models to close these accessibility gaps in the most financially efficient way.

One option is to introduce subscription models purpose-designed for lower-income populations in the form of subsidy schemes or co-financing models for internet access and digital devices. These schemes should be designed based on a needs assessment to avoid linking them to a single criterion, such as social welfare. Some families or individuals could be denied this benefit because their income does not necessarily reflect their actual needs (e.g. families with several school-age children sharing a single device, or agricultural households with large farmland but without technology or workforce to operate it, etc.).

The second option, which is more related to a systemic approach, is to build and rely on public-private partnerships, where both the public sector and private companies (such as telecom providers, tech companies, and NGOs) work towards set policy goals. In the context of the digital divide, PPPs can help provide the infrastructure and resources. There are several models for this as well. One common model involves government subsidies or incentives to encourage private companies to expand their service offerings in underserved areas. Another model is the collaborative creation of community technology centres to provide the local population with access to digital devices and the internet. For this to be sustainable and effective, there cannot be a misalignment of goals between public and private sector partners (equity vs. profit orientation).

2. Digital literacy and confidence

Empowering people to use online tools safely and effectively is recognised as a strategic priority in all project countries. However, the means to achieve this goal are diverse, and some are underutilised. Learning opportunities go beyond formal education and should be designed with a focus on the needs of the learner. Whether in educational institutions, workplaces, or community settings, they need to be accessible and adequate avenues for individuals to acquire, adapt and refine digital competences. These opportunities should cover the whole continuum from basic digital awareness of the range of online tools available for everyday activities—identification, authentication, transaction, communication and learning—to more advanced technical proficiencies like programming and data analytics.

As all countries have already done, integrating digital competences into the formal education curriculum is paramount. However, research shows that there is some misalignment between how students learn about digital technologies at school and the advanced levels of competence needed for participation in the digital world. Subjects that target digital skills at all levels of education should be reviewed and, if necessary, revised so that the outcomes are connected to the DigComp framework.[9] The same applies to digital competences of teachers, and therefore programmes of pre-service

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

and in-service education need to be aligned with EU frameworks such as DigCompEdu[10].

As highlighted in national reports, community training opportunities must be included in national policy and implemented sustainably. The positive effects of these programmes have been confirmed in all countries, but unfortunately, they are also project-based, CSO-led and smaller in scope. Custom-developed training programmes that address the needs of specific (vulnerable) communities are complex, but when provided within a community and in cooperation with the private and CSO sectors, they can be delivered efficiently even in the most remote locations.

Finally, digital literacy should be supported by the ongoing availability of training seminars that will enable citizens to utilize digital tools for their professional development. Digital literacy and utilization are tightly connected to one's socio-economic standing, access to jobs and therefore professional development.

3. Inclusively designed services and content

Going back to the beginning, true inclusion means a political and ethical commitment to transforming and removing the systemic barriers that vulnerable groups face. This also means that governments should aim to make their digital services inclusive by design, and also use digital technology to remove barriers in the non-digital realm. Adapting platforms, services and websites when they are already operational and in use indicates that the initial idea and design were not developed with respect to inclusion principles. A much more effective and efficient route is to apply inclusive design from the beginning, which can only be achieved with the participation of groups at risk.

Accessibility for users with disabilities or with diverse cultural and linguistic backgrounds means very different things. National reports show that even some integrated accessibility features are actually not useful for certain persons with disabilities. With the rapid digitalisation of all systems, we can foresee future barriers for persons with disabilities, similar to those encountered with the ETIAS system, if services are not inclusive by design.

Achieving true accessibility requires more than just compliance with legislation; it involves actively engaging end users—especially those with disabilities—throughout the design and development process.

It is recommended that the whole digital transformation process led by governments should be anchored in user-centred design (UCD). This human-centred approach prioritises the needs, preferences and limitations of end users in the design and development of products and services. It entails actively engaging users throughout the design process to ensure that the final product or service meets their expectations and fulfils their requirements.

On the legislative side, countries should comply with the harmonised European standard EN 17161 *Design*

10 https://joint-research-centre.ec.europa.eu/digcompedu_en

for All – Accessibility, which involves following a Design for All approach in products, goods, and services to extend the range of users.[11] This procedural standard describes how to achieve accessibility using a Design for All approach that extends the range of users. The standard provides a comprehensive framework for integrating accessibility considerations into all stages of product and service development.

To conclude, digital inclusion is neither a bottom-up nor a top-down process. There must be strong leadership and commitment at the national level, providing a framework and standards to be respected by all actors. Additionally, there must be a platform for end users to state their needs and advocate for them.

11 https://accessible-eu-centre.ec.europa.eu/content-corner/digital-library/en-171612019-design-all-accessibility-following-design-all-approach-products-goods-and-services_en?prefLang=it

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ANNEX
PROMISING PRACTICE EXAMPLES

Good practice examples are selected by national researchers and described in more detail in the National Reports.

Albania

In 2023, the civil society organisation Walk in My Shoes identified a significant barrier to digital access among Roma and Egyptian communities: many community members were unable to use the e-Albania platform independently. To access online services, individuals frequently visited internet centres but often forgot their login credentials—making them vulnerable to exploitation. In some cases, their accounts were blocked, and they were required to pay to restore access.

In response, the organisation launched the **e-Albania Corner Initiative,** operating in nine localities across the country. These support hubs, integrated into local after-school programmes and functioning three times a week, provide hands-on assistance with accessing and navigating e-Albania. To raise awareness and promote uptake, the team conducted a grassroots information campaign through door-to-door leaflet distribution and posters in prominent community spaces.

The impact has been significant: over 600 e-Albania accounts have been created, and more than 1,500 official documents have been downloaded, including school registration forms, housing and property documents, pension applications and ID/passport forms.

While the initiative primarily targets Roma and Egyptian communities, approximately 30% of beneficiaries come from other vulnerable groups, demonstrating a broader community need. Launched in 2023, the initiative is ongoing and serves as a scalable model for inclusive digital service delivery.

Bosnia and Herzegovina

The Akelius Digital Language Course, implemented in partnership with the ministries of education and with the support of UNICEF, is an important initiative aimed at improving access to education for children—particularly Roma children and children on the move—by including them in the formal school system in Bosnia and Herzegovina. The programme combines online and offline learning methods, using interactive and gamified content to develop language skills essential for educational inclusion. It included:

Development and implementation of a multilingual digital platform with tailored content; training of teachers and school staff.

Cooperation with families to ensure continuity of learning at home.

Installation of the Akelius application on devices that could be used offline, with the support of parents or guardians.

The provision of tablets and internet access for students without equipment.

Continuous monitoring and adaptation of content.

Impact has been significant, as it has enabled more than 1,500 Roma and migrant children to acquire basic and intermediate language skills necessary for successful school integration. It has also increased the digital competences of students and teachers and piloted a replicable model that combines digital tools and inclusive pedagogy, applicable to other marginalised groups in the country.

Kosovo

The Kosovo Digital Economy (KODE) Project, implemented by the Ministry of Economy (2019–2024) with the support of the World Bank, aimed to reduce digital inequalities by expanding broadband connectivity—particularly in rural and underserved areas—and improving digital skills through targeted training. It included:

The deployment of broadband internet infrastructure in 203 villages.

Enhanced internal digital connectivity in 197 primary and secondary schools.

The establishment of the Kosovo Research and Education Network (KREN).

The provision of digital skills training to 2,190 young people, emphasising employability and online work, including targeted outreach to women (881 female participants).

KODE significantly improved digital access in rural communities, narrowed infrastructure gaps, and provided foundational digital skills to young people, enhancing their employability. It demonstrates how focused investment and cross-sectoral cooperation can effectively address core digital inclusion challenges and serve as a scalable model for broader digital transformation in Kosovo.

North Macedonia

The National Strategy for People with Disabilities (2023–2030), implemented by the Ministry of Labour and Social Policy with the support of the Ministry of Digital Transformation and CSOs, focuses on digital accessibility as a tool for inclusion. Key actions include digitising social security procedures, providing schoolbooks in audio/Braille formats, and adapting e-services to enable full participation.

The implementation of this strategy has contributed to a 10% increase in the enrolment of students with special needs in mainstream schools for the 2023/2024 academic year, with 820 educational assistants deployed. The strategy aligns with the UN CRPD and EU standards, offering a replicable model for cross-sectoral policy aimed at reducing digital exclusion among persons with disabilities.

Serbia

Project **Caravan of Digital Skills, Literacy and Safety** – **Digital Expedition: Link for All** was implemented from 2021 to 2023 in partnership with MoIT, MoLEVSA, the Office for Information Technologies and eGovernment, UNDP, USAID and the organisation Propulsion. The goal of the project was to provide all interested citizens—from the youngest to Generation Z and their parents, to the oldest citizens who may not be familiar with electronic services— with the opportunity to become acquainted with key digital skills of the 21st century.

As part of the project, a Digital Corner was also established for the older citizens. This space enables them to attend specially designed courses and learn about the use of new technologies, allowing them to carry out everyday life activities more independently. The project is also notable for including cities and municipalities with lower levels of development.