EUROPEAN
COMMISSION

Brussels, 16.6.2025
SWD(2025) 294 final

PART 4/27

COMMISSION STAFF WORKING DOCUMENT

Digital Decade 2025 country reports

Accompanying the document

Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee and the Committee of the Regions

State of the Digital Decade 2025: Keep building the EU's sovereignty and digital future

{COM(2025) 290 final} - {SWD(2025) 290 final} - {SWD(2025) 291 final} -
{SWD(2025) 292 final} - {SWD(2025) 293 final} - {SWD(2025) 295 final}

European Commission

DIGITAL DECADE 2025
COUNTRY REPORTS

Croatia

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Contents

Executive summary

Croatia has made significant strides in strategic technological sectors but still faces challenges in the widespread adoption of advanced digital technologies. Progress in areas, such as quantum communication, semiconductors, and cybersecurity has strengthened its growing contribution to EU competitiveness and sovereignty.

Croatia shows a substantial level of ambition in its contribution to the Digital Decade, having set 13 national targets, 77% of which are well aligned with the EU's 2030 targets. The country is following its trajectories moderately well with 63% of them being on track (on the basis of the 2024 trajectories defined for all 8 KPIs analysed). Croatia addressed 50% of the 12 recommendations issued by the Commission in 2024 by making some changes through new measures.

In 2024, the government continued its strategic reforms, with digitalisation efforts increasingly linked to strengthening industrial competitiveness, fostering innovation, and boosting technological sovereignty. To make the most of the digital transition, Croatia must tackle persistent gaps in edge infrastructure, SME digitalisation, the uptake of advanced technologies, and support for high-growth enterprises.

Digital Decade KPI (1)	Croatia				EU		Digital Decade target by 2030	
	DESI 2024 (year 2023)	DESI 2025 (year 2024)	Annual progress	National trajectory 2024 (3)	DESI 2025	Annual progress	HR	EU
Fixed Very High Capacity Network (VHCN) coverage	67.8%	78.9%	16.4%	68.0%	82.5%	4.9%	100.0%	100%
Fibre to the Premises (FTTP) coverage	62.1%	75.4%	21.4%	66.0%	69.2%	8.4%	100.0%	-
Overall 5G coverage	83.4%	94.2%	12.9%	85.7%	94.3%	5.9%	99.0%	100%
Edge Nodes (estimate)	3	6	100.0%	-	2 257	90.5%	-	10 000
SMEs with at least a basic level of digital intensity (2)	-	63.5%	4.8%	-	72.9%	2.8%	90.0%	90%
Cloud	40.7%	38.6%	-5.4%	-	-	-	75.0%	75%
Artificial Intelligence	7.9%	11.8%	49.0%	13.0%	13.5%	67.2%	20.0%	75%
Data analytics	51.7%	-	-	-	-	-	30.0%	75%
AI or Cloud or Data analytics	65.6%	-	-	-	-	-	-	75%
Unicorns	2	2	0.0%	2	286	4.4%	4	500
At least basic digital skills	59.0%	-	-	-	-	-	80.0%	80%
ICT specialists	4.3%	5.0%	16.3%	4.5%	5.0%	4.2%	7.0%	~10%
eID scheme notification		Yes						
Digital public services for citizens	67.2	75.2	11.9%	75.0	82.3	3.6%	100.0	100
Digital public services for businesses	66.2	65.3	-1.3%	75.0	86.2	0.9%	100.0	100
Access to e-Health records	85.6	86.6	1.2%	95.0	82.7	4.5%	100.0	100

(1) See the methodological note for the description of the indicators and other metrics.
(2) DESI 2025 reports Version 4 of the Digital Intensity Index, which is comparable with the DII value from DESI 2023 (referring to year 2022) for the calculation of annual progress. It is not comparable to the national trajectory, which is based on Version 3 of the index.
(3) National trajectory value if present in the national roadmap and if the indicator was measured in DESI 2025 (year 2024).

According to the 2025 special Eurobarometer on the Digital Decade, 81% of Croatians consider that the digitalisation of daily public and private services is making their lives easier. On the action of the public authorities, 90% consider it important to counter and mitigate the issue of fake news and

disinformation online. And on competitiveness, 91% consider it important to ensure that European companies can grow and become 'European Champions' capable of competing globally.

A competitive, sovereign, and resilient EU based on technological leadership

Croatia has made significant progress in FTTP and 5G deployment, surpassing the average EU growth rates. VHCN, although still below the EU average, progresses at a swift pace, driven by infrastructure programmes backed by the Recovery and Resilience Facility (RRF). However, Croatia faces challenges in deploying stand-alone 5G networks, with limited progress and no specific measures in place to speed up the roll-out. Rural mid-band 5G coverage also remains well below the EU average, and a comprehensive demand-side strategy to stimulate uptake is only expected after 2027.

The country also holds a strong position in the adoption of data analytics. Although the basic digital intensity of SMEs grew faster than in the rest of the EU, it remains well below the EU average. Croatia continues to face challenges in the uptake of AI and cloud services, where adoption is lower than EU average. The start-up and scale-up ecosystem also remains weak, with only two unicorns recorded and limited venture capital activity.

The launch of a national quantum communication project and the launch of a semiconductor competence centre are expected to strengthen Croatia's position in strategic technologies. The country has also started taking steps towards decentralising ICT infrastructure with the deployment of six edge nodes. However, the edge computing ecosystem remains underdeveloped and lacks a dedicated national strategy. The country's cybersecurity capacity has improved with the adoption of the Cybersecurity Act and the launch of the National Coordination Centre for Industry, Technology, and Research in Cybersecurity; however, key standards like Internet Protocol version 6 and Domain Name System Security Extensions remain far below the EU average, signalling persistent vulnerabilities in the national digital infrastructure.

Protecting and empowering EU people and society

Despite solid digital skills among young people, Croatia continues to face major challenges in digital inclusion, with persistent skill gaps affecting older adults, people with lower education levels, and the rural population. While the share of ICT specialists in employment has improved and matches the EU average, shortages remain, labour market mismatches persist, and brain drain continues to weaken the digital talent pipeline.

Public digital services for citizens have improved steadily and are broadly on track, but digital public services for businesses shows negative trends, including a decline in cross-border service availability. Preparations for the national Digital Identity Wallet are advancing, which will reinforce secure access frameworks. Access to health records is strong, but some key gaps remain: medical images are unavailable, some healthcare providers are not connected, and delegated access is not possible. Supporting a more inclusive and trusted digital transition, Croatia has intensified efforts to promote media literacy, cybersecurity awareness, and protection against online risks, particularly among young people.

Leveraging digital transformation for a smart greening

Green and digital priorities are receiving greater attention in Croatia, supported by major investments from the RRF. Croatia has made progress in digitalising its energy infrastructure and improving water management systems with digital monitoring solutions. However, the country still lacks a coherent

national strategy linking digitalisation to climate objectives, and systematic monitoring of emission reductions through digital technologies has not yet been put in place. Consumer awareness of the environmental impact of ICT devices remains low, and voluntary sustainability efforts in the digital sector are still fragmented.

National Digital Decade strategic roadmap

Croatia submitted an adjustment to its national roadmap in January 2025, refining its set of measures and updating key connectivity targets. The adjustment was prepared with broad stakeholder consultation and addresses a substantial number of 2024 recommendations. The roadmap maintains a strong focus on strengthening digital infrastructure, SME digitalisation, digital skills development, and digital public services. However, gaps persist in the widespread adoption of advanced technologies, scaling up innovation-driven enterprises, and fully closing inclusion gaps in digital skills, particularly for older adults and rural areas. Overall, the Croatian roadmap includes 31 measures with a combined budget of 634.73 million, representing approximately 0.74% of the country's GDP.

Funding & projects for digital

Croatia allocates 20% of its total recovery and resilience plan to digital (EUR 1.4 billion)[1]. In addition, under cohesion policy, EUR 755 million, representing 9% of the country's total cohesion policy funding, is dedicated to advancing Croatia's digital transformation[2].

Croatia is a member of the three European Digital Infrastructure Consortia (EDICs): the Alliance for Language Technologies EDIC, the Local Digital Twins towards the CitiVERSE EDIC and the EUROPEUM EDIC. Croatian organisations are indirect partners in the Important Project of Common European Interest on Next Generation Cloud Infrastructure and Services (IPCEI-CIS). Croatia is a participating state of the EuroHPC Joint Undertaking (JU) and of the Chips JU.

Croatia has contributed to the Best Practice Accelerator[3] by sharing one best practice under the Digital Skills cluster ('Women in Digital – Girls in ICT').

Digital rights and principles

According to a support study Croatia has been relatively active in implementing the European Declaration on Digital Rights and Principles, with 48 initiatives overall and 7 new initiatives launched in 2024. Croatia is most active in the area of solidarity and inclusion. Less activity has been identified with regards to a fair digital environment. Measures in the area of sustainability appear to have most impact on the ground, in contrast to those addressing putting people at the centre of the digital transformation.

[1] The share of financial allocations that contribute to digital objectives has been calculated using Annex VII to the Recovery and Resilience Facility Regulation. Last data update: 16 May 2025.
[2] This amount includes all investment specifically aimed at or substantially contributing to digital transformation in the 2021-2027 Cohesion policy programming period. The source funds are the European Regional Development Fund, the Cohesion Fund, the European Social Fund Plus, and the Just Transition Fund.
[3] The Best Practice Accelerator (BPA) is a platform that enables Member States to share successful measures and challenges encountered in their efforts to meet their Digital Decade targets and objectives. Best practices are made available to Member States via the BPA Repository and showcased in regular workshops, currently focused on three thematic clusters: Digital Skills, Green IT, and the Uptake of Digital Technologies.

Recommendations

- **Public services:** Strengthen the interoperability and user-friendliness of public services to encourage people and businesses to use them more.
- **e-Health:** Introduce a comprehensive legal and technical framework for enabling authorised individuals' access to electronic health data on behalf of others; make medical imaging accessible to individuals via the national online health access service; and ensure that all healthcare providers, including geriatric nursing homes and mental health facilities, are connected and actively supplying data.
- **Basic digital skills:** Intensify targeted action to bridge the digital skills divide across age, education, and rural-urban populations.
- **ICT specialists**: Expand training, upskilling, and retention programmes for ICT specialists, strengthen alignment with labour market needs, and tackle brain drain to safeguard Croatia's digital talent pipeline.
- **SME digitalisation**: Develop targeted programmes and incentives to increase SMEs' adoption of cloud, AI, and data analytics solutions, narrowing the gap between digitally advanced enterprises and those lagging behind.
- **Edge nodes:** Increase efforts in the area of edge nodes in view of their importance for competitiveness, resilience, sovereignty and climate action.
- **5G**: Accelerate full gigabit and 5G coverage, especially by addressing operational bottlenecks (planning, permitting) and expanding mid-band 5G spectrum deployment.
- **Cybersecurity**: Develop targeted cybersecurity support programmes for SMEs, expand resilience testing, and strengthen national capacity to address cyber incidents in the public and private sectors.

A competitive, sovereign and resilient EU based on technological leadership

Croatia continues to strengthen its digital competitiveness, making notable progress in enhancing its digital infrastructure and accelerating the digital transformation of its economy. The ICT sector plays an increasingly important role, contributing 5.32% to the country's gross value added in 2021 – above the EU average [4]. This contribution stems primarily from the dominance of ICT services, which represent around 70% of the sector's activity, followed by equipment sales and, to a lesser extent, hardware manufacturing. The sector has experienced steady growth in recent years, driven by strong government modernisation efforts and robust enterprise investments, particularly in digital technologies such as software development and ICT services [5]. These services, including software development and IT consulting, are increasingly contributing to Croatia's export growth and competitiveness [6].

The broader economic context remains favourable. In 2025, Croatia maintains robust growth supported by EU funds, eurozone membership, and Schengen integration, with a steady rise in export-oriented services and digital trade [7]. The digital sector plays a growing role in this trend, notably through Croatia's active participation in European initiatives to boost research and development (R&D) and innovation. ICT R&D personnel represented 36.75% of the national total in 2021 and 35.26% in 2022. However, structural constraints – including labour shortages and fragmentation in the R&D landscape – continue to weigh on the economy's long-term growth potential.

R&D intensity reached 1.39% of gross domestic product (GDP) in 2023, up from 0.95% in 2018, largely driven by investments from the Recovery and Resilience Plan (RRP) and cohesion policy [8]. **Business R&D in the ICT sector accounted for 26.7% of total R&D** spending, highlighting its growing role in driving innovation. Nonetheless, public research remains fragmented, and further reforms are needed to ensure stronger institutional coordination and impact.

Digital innovation is gaining momentum, and the start-up ecosystem is evolving. Croatia outperforms the EU average in the adoption of cloud technologies and data analytics; however, the uptake of artificial intelligence remains modest. While the number of unicorns remains limited and venture capital investment (0.028% of GDP) falls below the EU average (0.078%), new measures – including the Vesna Deep Tech Venture Fund and improved R&D tax incentives – aim to improve access to finance and strengthen the innovation environment for high-growth firms [9].

Croatia's performance in digital infrastructure and business digitalisation is improving. Significant investments have been made to expand high-capacity network connectivity and accelerate the digital transformation of small and medium-sized enterprises (SMEs) – both essential for strengthening the business environment and boosting overall economic competitiveness [10].

[4] Most of the indicators mentioned in the country report are explained in the DESI 2025 Methodological Note accompanying the State of the Digital Decade report 2025.
[5] International Trade Administration, Croatia Country Commercial Guide. Available here: https://www.trade.gov/country-commercial-guides/croatia-information-and-communication-technology
[6] European Commission. (2025). European Semester Annex on Innovation to Business: Croatia.
[7] Economist Intelligence, One-click report: Croatia, 2025.
[8] ibid.
[9] ibid.
[10] European Commission (2025). European Semester Annex Making Business Easier: Croatia.

Building technological leadership: digital infrastructure and technologies

Croatia is making strong progress in rolling out digital infrastructure, with some of the fastest growth rates in fibre and very high-capacity network (VHCN) coverage across the EU, particularly in rural areas, where coverage remains low but is catching up rapidly. The country is also advancing in strategic domains such as semiconductors and quantum technologies, though challenges remain in edge computing, mid-band 5G coverage, and gigabit service uptake.

Connectivity infrastructure

Croatia is at 78.93% of VHCN coverage (2030 national target: 100%) after an increase of +16.4% in 2024 and stands just below the EU average of 82.49%. The country is on track according to its national trajectory. However, Croatia's growth rate notably outperformed the EU average of 4.9%. For households in rural areas, VHCN coverage reached 49.09%, under the EU rural average of 61.89%, but with a very high annual growth rate of 92.8%, significantly exceeding the EU's 11.3%. These results suggest that Croatia exceeded its expected 2024 trajectory of 66%.

Fibre to the premises (FTTP) coverage in Croatia reached 75.39% in 2024 (national target: 100%), up +21.4% from 2023 and above the EU average of 69.24%. The country is on track according to its national trajectory.

In rural areas, FTTP coverage stood at 44.43%, still below the EU's 58.78%, but Croatia recorded exceptional annual growth of 126.0%, compared to the EU's 11.9%. Although no separate national FTTP trajectory has been reported, the observed pace of deployment is aligned with the country's broader VHCN goals.

Croatia reached 94.20% of 5G coverage in 2024 (national target: 99%), showing an increase of +12.9%, just below the EU average of 94.35%. The country is on track according to its national trajectory. In rural areas, 5G coverage was 86.35%, exceeding the EU rural average of 79.57%. However, rural growth of 7.8% was below the EU's 11.9%, indicating that further acceleration is needed in sparsely populated areas.

Coverage in the strategic 3.4-3.8 GHz band remains a challenge. Croatia's national coverage in this band stood **at 45.18% in 2024, compared to the EU average of 67.72%, with a growth rate of 13.0% vs the EU's 32.6%.** In rural areas, coverage reached only 8.48%, far below the EU rural average of 26.19%, and with a modest increase of 5.7%, signalling the need for intensified mid-band 5G roll-out.

On spectrum, **Croatia has assigned 100% of the harmonised spectrum in the 5G pioneer bands as of 2024 and 2025**, standing well above the EU averages of 73.4% and 74.63%, respectively. This places Croatia among the top performers in regulatory readiness.

In terms of fixed broadband take-up, 43.64% of subscriptions were ≥ 100 Mbps in 2024 (up from 38.62% in 2023), below the EU average of 71.88%, but with a growth rate of 13.0%, outpacing the EU's 9.1%. For 1 Gbps subscriptions, Croatia rose from 3.22% to 5.81% year-on-year, while the EU increased from 18.47% to 22.25%. Though the absolute share remains low, Croatia's 80.4% growth far exceeded the EU's 20.5%, reflecting rising consumer demand.

5G SIM card penetration reached 34.8% in 2024 (up from 17.38% in 2023), just below the EU average of 35.56%. With a growth rate of 100.2% compared to the EU's 63.9%, Croatia shows strong momentum in consumer adoption of 5G services.

Croatia

VHCN and FTTP

Croatia's target for VHCN and FTTP coverage remains at 100% by 2030, as defined in the initial roadmap submitted in 2023. Given the strong public investment and improved FTTP roll-out observed in 2024, the target appears **realistic**. The strong growth already achieved, combined with Croatia's consistent alignment with or outperformance of EU benchmarks, supports this assessment.

The strategy is underpinned by significant funding from the RRP, with EUR 125.7 million allocated to the national broadband infrastructure programme targeting areas with insufficient commercial interest (ONP), enabling the roll-out of FTTP coverage to approximately 124 000 households and 700 000 residents. A further EUR 19.6 million was secured under the RRP to support the construction of passive infrastructure in rural areas, improving access to VHCN networks.

To complement these supply-side investments, Croatia plans to introduce a demand-side voucher scheme post-2027 to support gigabit uptake for up to 125 000 households. This dual approach is essential to ensuring both availability and adoption, particularly in less commercially attractive areas.

Croatia is also investing in its future backhaul capacities for underserved areas through the national programme for broadband backhaul infrastructure (NP-BBI), expected to be completed by 2030. However, implementation has faced significant delays. The design phase is underway, but progress remains limited, and outcomes are yet to be demonstrated.

No new fibre roll-out measures were included in the 2024 roadmap adjustment. However, given the strong performance to date and the comprehensive programme structure already in place, this omission appears justified. The roadmap continues to prioritise rural deployment, demand stimulation, and administrative streamlining.

The copper switch-off process remains at an early stage. As of early 2025, no formal decommissioning plan has been submitted by the incumbent operator, although conditions for partial switch-offs are met in several FTTP-covered areas. Croatia's electronic communications regulator, HAKOM, has confirmed that any future switch-offs will be subject to case-by-case approval under the Electronic Communications Act.

Recent market developments, including the emergence of a new operator now leading over half of the co-financed projects, have increased implementation capacity and enhanced competitive pressure. **Nonetheless, key barriers remain**, such as high construction costs in sparsely populated areas, affordability gaps among elderly and low-income populations, and heterogeneous fee regimes imposed by local authorities. To address these, Croatia is preparing legislative updates in Q3 2025 **to transpose the General Infrastructure Act.**

In summary, Croatia's strategy to achieve universal VHCN and FTTP coverage by 2030 is credible, well-supported, and advancing steadily. Key next steps include putting into operation the gigabit broadband voucher scheme, improving affordability, and maintaining momentum through proactive regulatory and stakeholder engagement.

2024 recommendation: Continue and expand the measures aimed at supporting FTTP roll-out, aiming to fully close the rural-urban divide, including by supporting demand for gigabit services.
In 2024, Croatia continued implementing existing measures but did not take any new measures. The country continued implementing major RRP-funded infrastructure programmes and confirmed the upcoming launch of a voucher scheme targeting gigabit uptake in underserved areas. Preparatory work is also ongoing on legislative updates to support cost-effective roll-out. While no

new measures were introduced in the 2024 roadmap adjustment, the scope and scale of ongoing investments justify this. Further efforts may be needed to accelerate demand-side measures before 2027 and to ensure affordability for vulnerable groups.

5G

In its 2024 roadmap adjustment, Croatia updated its 5G target to reach 99% coverage of inhabited areas and 75% coverage in the 3.4-3.8 GHz band by 2030. These targets reflect a moderate but realistic ambition, taking into account Croatia's fragmented geography, smaller market size, and existing spectrum allocation. With full spectrum availability across all pioneer bands and the steady deployment pace observed in 2024, the country remains broadly on track to meet its national objectives, although continued focus will be required in mid-band deployment and rural coverage. General 5G coverage is progressing well, but standalone 5G remains limited.

To support these targets, Croatia introduced new measures in its 2024 roadmap adjustment aimed at **improving coordination and addressing roll-out barriers**, especially for standalone 5G and rural coverage. A key development is the creation of a **national 5G working group**, coordinated by HAKOM, which brings together telecom operators, industry, and academia. This group facilitates information exchange, identifies regulatory obstacles, and supports preparation for industrial 5G use cases.

Another important measure is the **Digital Connectivity Programme**, financed under the RRP. In 2024, Croatia made progress with procurement procedures, and the national broadcasting infrastructure operator **OiV was selected** to deploy passive infrastructure in rural areas.

While these actions demonstrate progress, the roadmap signals that a more comprehensive demand-side strategy is not expected until after 2027, following a funding gap assessment planned for 2026. This delay may limit near-term uptake, particularly for standalone 5G. Operators reported that market readiness and clear industrial use cases are still lacking. As of early 2025, there is no regulatory pressure to accelerate standalone deployment, although the authorities are monitoring market signals and may consider intervention as industrial demand develops.

Croatia is one of the few EU Member States to have **fully assigned 100% of the harmonised spectrum in all three 5G pioneer bands**: 700 MHz, 3.6 GHz, and 26 GHz. These bands were fully allocated through public auctions concluded in 2021 and 2023. In the 3.4-3.8 GHz band specifically, all national operators have been granted 100 MHz blocks, while the 3.4-3.48 GHz sub-band is allocated for regional use.

These allocations provide the basis for high-capacity 5G deployment nationwide. However, rural mid-band coverage remains limited, and Croatia will need to accelerate deployment in this frequency range to meet its 2030 target.

2024 recommendation: Ensure that new players have sufficient access to spectrum for innovative B2B and B2C applications and encourage operators to speed up the deployment of 5G standalone core networks.

Croatia made some efforts to address the recommendation through new policy actions in 2024. While the 2024 roadmap does not include new spectrum access schemes for alternative or vertical players, Croatia has fully assigned all harmonised 5G pioneer bands, ensuring spectrum availability for future demand. The establishment of a national 5G working group coordinated by HAKOM provides a structured forum for identifying regulatory and market barriers, including access issues for innovative use cases.

Regarding 5G standalone deployment, progress remains limited. The roadmap adjustment does not introduce direct incentives or targets for standalone core roll-outs, but Croatia has confirmed that the current market environment does not yet justify regulatory intervention. The authorities are monitoring developments closely and anticipate further action once industrial demand emerges, supported by the funding gap assessment planned for 2026.

Semiconductors

Semiconductors are gaining strategic importance in Croatia's digital industrial policy, with national efforts focused on chip design, characterisation, and SME support. While no new measures were introduced in the 2024 roadmap update, the planned implementation of the Croatian Competence Centre for Semiconductors (CROCCS) has progressed. CROCCS is coordinated by the University of Zagreb's Faculty of Electrical Engineering and Computing and was positively evaluated under the DIGITAL-chips-2024-SG-CCC-1 call. A grant agreement is under preparation, with expected co-funding of EUR 1million annually from 2025 to 2028 through the Digital Europe Programme and national sources.

The centre brings together a consortium of eight national partners, including Rimac Technology, KONČAR, and the Ruđer Bošković Institute. CROCCS will provide SMEs and academic institutions with access to chip design tools, advanced characterisation and measurement infrastructure, and services for testing and validation. These capabilities will be supported by both existing facilities and newly acquired equipment distributed across the partner institutions.

The chip characterisation laboratory in Zagreb is expected to serve as a national and EU-level facility, with particular expertise in power device testing and electrostatic discharge (ESD) simulations. SME users will be supported in accessing EU pilot lines and preparing market-ready demonstrators, with services offered at no or reduced cost.

While Croatia does not currently host fabrication plants or large-scale manufacturing capacity, its role in the semiconductor value chain is anchored in design, prototyping, and research infrastructure. CROCCS also aims to attract investment, strengthen talent retention, and promote innovation in high-tech sectors such as automotive and energy.

No direct policy link has been established between semiconductors and critical raw materials, but Croatia is developing broader circular economy initiatives, including material reuse measures financed through the RRP. These may provide a foundation for future alignment with raw materials strategies.

Croatia's contribution to European semiconductor sovereignty lies in research, design, and advanced infrastructure rather than industrial-scale production. CROCCS represents a significant step toward integrating national capabilities into EU-level efforts under the European Chips Act.

Edge nodes

According to the Edge Node Observatory, **Croatia had deployed a total of six edge nodes by 2024**, doubling the number from 2023 but still placing Croatia among the countries with the lowest number of edge nodes. This increase highlights the initial steps toward decentralising ICT infrastructure but also reflects the absence of a strategic national framework in this area.

In 2024, **no field trials or dedicated funding measures were launched** to support edge computing infrastructure. Croatia currently lacks a strategy specifically targeting the development and deployment of edge nodes. Public ICT resources remain concentrated in **centralised state cloud**

infrastructure, operated by entities such as **APIS IT** (Agency for Support to Information Systems and Information Technologies), **FINA** (Financial Agency), **CARNET** (Croatian Academic and Research Network), and **AKD** (Agency for Commercial Activities). While some of these providers maintain physical decentralisation across facilities, the operational set-up does not align with the architectural principles of edge computing, which brings compute capacity closer to end users.

The **Act on Digital Information Infrastructure (ZODII)**, regulates access to the State cloud for public and private actors has been adopted in May 2025. However, the legislative scope currently focuses on **interoperability and cloud governance**, without addressing edge-specific infrastructure needs.

In this context, Croatia's edge node ecosystem remains underdeveloped and disconnected from ongoing broadband and 5G deployment efforts. A clear strategy – including **defined objectives, timelines, and incentives** – will be essential to integrate edge computing into the broader digital infrastructure landscape.

2024 recommendation: Increase efforts in the area (…) of edge nodes, in view of their importance for competitiveness, resilience, sovereignty, European values and climate action.
No information available on measures taken to address the recommendation. There is no national monitoring framework, no dedicated roadmap measures, and no national funding instruments to support edge computing development. Public ICT infrastructure remains highly centralised in the State cloud, and there is currently no national strategy or deployment trajectory for edge nodes.

Quantum technologies

In 2024, Croatia continued its engagement in quantum technologies with the Croatian Quantum Communication Infrastructure (CroQCI) project. Supported by EU funding since 2023, the project's total value backed is EUR 10 million and is implemented by a national consortium of eight partners. It aims to deploy terrestrial and space-based quantum communication technologies, contributing to the EU-wide quantum infrastructure and enabling ultra-secure data transmission for public and scientific services.

The CroQCI project includes activities to demonstrate quantum key distribution (QKD), build testing environments, and strengthen domestic expertise. It is expected to facilitate secure communications and support training, research, and knowledge transfer within Croatia. The initiative was acknowledged during the 2025 fact-finding mission as a key measure for advancing quantum communication in the country.

In parallel, Croatia is investing in quantum computing development through a dedicated measure in its 2024 digital roadmap. Led by the University of Zagreb's Computing Centre (SRCE), the measure focuses on establishing a test environment for quantum and hybrid computing simulations, integrated within the national high-performance computing (HPC) ecosystem. SRCE's role includes facilitating access for academic and industrial users and contributing to the advancement of strategic computing infrastructure.

While Croatia's quantum ecosystem remains research-oriented, these initiatives show substantial progress in building up national capabilities and aligning with broader EU efforts. Both the CroQCI and quantum computing measures form the foundation for Croatia's long-term participation in secure and advanced digital technologies.

2024 recommendation: Increase efforts in the area of quantum computing […], in view of their importance for competitiveness, resilience, sovereignty, European values and climate action.

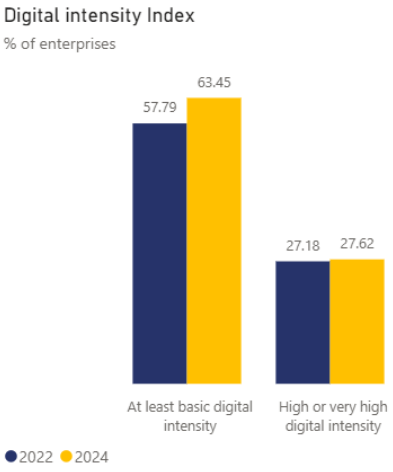
Croatia made some efforts to address the recommendation through new policy actions in 2024. The measures, led by SRCE, aim to develop a test environment for quantum and hybrid computing simulations integrated into the national HPC ecosystem. While this constitutes a first step toward strengthening institutional and research capacity, there is no evidence of a broader strategic framework or targeted support for industry and commercial applications. Efforts in quantum communication were more advanced, with the launch of the EU-funded CroQCI project, implemented by a national consortium to support secure quantum infrastructure. Overall, Croatia's engagement remains research-focused and at an early stage, and further efforts will be needed to scale up investment, define long-term governance, and ensure alignment with EU-level initiatives.

Supporting EU-wide digital ecosystems and scaling up innovative enterprises

The digitalisation of Croatian enterprises continued to improve in 2024, with notable advances in adopting advanced technologies but persisting challenges in the digital intensity of SMEs and innovation scaling. Building on the Draghi report's emphasis on competitiveness, this chapter analyses Croatia's progress in enterprise digitalisation, uptake of cloud, AI and data analytics, and the development of the start-up and scale-up ecosystem.

SMEs with at least basic digital intensity

In Croatia, **63.45% of SMEs had at least a basic level of digital intensity in 2024** (2030 national target: 90%), following an increase of +4.8% since 2022. This remains **significantly below the EU average of 72.91%**, despite one of the fastest improvement rates in the EUMore specifically, **only 27.62% of Croatian SMEs** reached high or very high digital intensity, also below the EU average of 32.66%. This reflects ongoing structural weaknesses in the digital transformation of Croatia's enterprise sector, particularly among micro- and small businesses.



Croatia continues to rely on a wide range of investment schemes to promote SME digitalisation. Under the RRP, **EUR 29.7 million in non-refundable support** has been allocated specifically for digital transformation of SMEs, alongside **EUR 62.2 million** awarded under the cohesion programme, covering a total of **over 2 500 contracts by 2023**. Additional funding under the 2021-2027 **Competitiveness and Cohesion Programme (PKK)** includes **earmarked funding of EUR 74 million**, of which over **EUR 51 million has already been granted**. These programmes target business process automation, digital tool adoption, and innovation scaling.

Croatia continues to rely on a wide range of investment schemes to promote SME digitalisation. Under the RRP, component related to digital economy EUR 29.7 million in non-refundable support has been allocated specifically for the digital transformation of SMEs, alongside **EUR 63.6 million awarded under the RRP and the European Regional Development Fund (ERDF)**, covering a total of over 2 500 contracts by 2023. **One example of additional funding under the 2021-2027 Competitiveness and Cohesion Programme includes EUR 60 million allocated to the Croatian Venture Capital Initiative 2**

(CVCi 2) initiative. These programmes target business process automation, digital tool adoption, and innovation scaling.

The national support framework has been reinforced through the establishment of **four European Digital Innovation Hubs (EDIHs)**, which became operational between late 2022 and early 2023. These include:

- **CROBOHUB++** at the University of Zagreb, focusing on services in artificial intelligence, cybersecurity, and HPC, including pre-investment testing, training, and support to SMEs for product development;
- **Adria EDIH** in Rijeka, promoting digital solutions in the maritime and energy sectors;
- **AI4Health.Cro**, coordinated by the Ruđer Bošković Institute, specialised in e-Health innovation and support for the European Health Data Space; and
- **JURK EDIH**, coordinated by the Regional Coordinator of Sisak-Moslavina (RK SMŽ), supporting digitalisation in the fields of artificial intelligence, blockchain, and gaming.

Together, they act as regional competence centres, providing SMEs with access to digital maturity assessments, pre-investment testing environments, training, and guidance in securing both national and EU-level financing. Their role is particularly important in underserved areas and for sectors with low digital maturity, ensuring more balanced support at local level.

Looking ahead, it will be essential to sustain the momentum of these support schemes, especially as Croatia moves towards bridging the digital intensity gap with the EU average. While Croatia's structural funding pipeline remains strong, fragmentation across instruments and limited technical support services for SMEs continue to pose challenges. Strengthening advisory services, enhancing coordination between national and regional schemes, and ensuring inclusive access for micro-enterprises will be key to raising overall SME digital maturity.

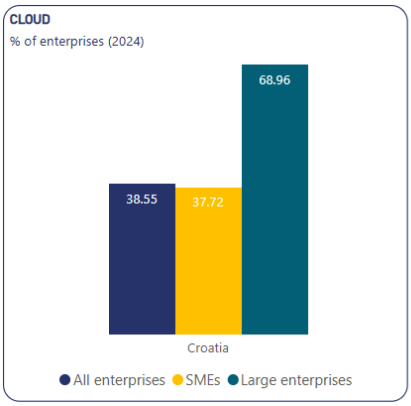
Take-up of cloud/AI/data analytics

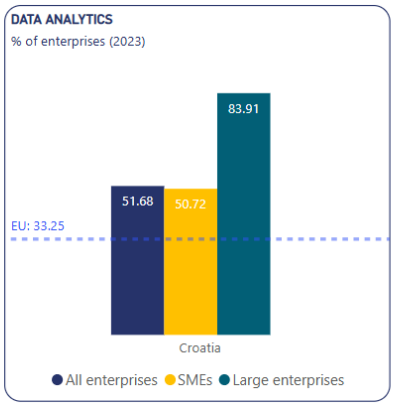
According to 2023 data, **65.59% of Croatian enterprises used at least one of the following technologies**: cloud computing, data analytics, and artificial intelligence, placing the country **well above the EU average of 54.7%**. Among SMEs, the uptake stood at **64.88%**, while **89.74% of large enterprises** reported usage, resulting in a **24.86 percentage point gap** – significantly narrower than the EU gap of 32.97. These results confirm Croatia's position as one of the stronger performers in digital technology uptake among enterprises, with progress driven by both structural funding and an increasingly supportive ecosystem.

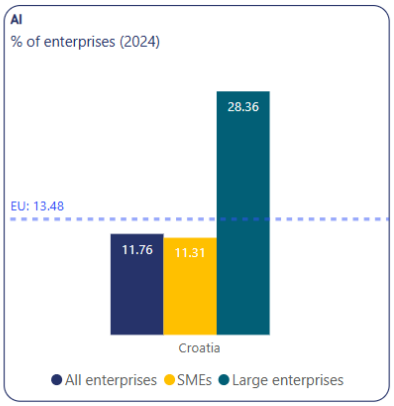
According to 2022 data from the Croatian Bureau of Statistics, SMEs in Croatia account for 60.2% of the total value added in the non-financial business economy, while large enterprises contributed 39.8%. SMEs accounted for **97.4% of all enterprises with more than 10 employees**, compared to just 2.6% for large firms. This structure underscores the importance of **boosting digital adoption among SMEs**, not only to close uptake gaps but also to fully realise the transformative potential of advanced technologies in a business environment dominated by small-scale operators [11].

[11] European Commission. (2025). European Semester Annex Making Business Easier: Croatia.

Croatia







- **Cloud**

Cloud computing remains the most widely adopted advanced technology among Croatian enterprises. In 2023, **40.73% of firms** used cloud services, slightly outperforming the EU average of 38.97%. SME adoption stood at **39.96%**, while **66.87% of large enterprises** made use of cloud services, resulting in a **26.91 percentage point difference** – a gap smaller than the EU average of 31.68. However, updated 2024 figures show a modest **decline in overall usage to 38.55%**, with SME uptake falling to **37.72%**, while large enterprise adoption continued to grow to **68.96%**, widening the gap to **29.15 points**.

This dip among SMEs may reflect cost pressures or implementation barriers, though support remains available through a mix of **RRP-funded investment grants**, **cohesion policy schemes**, and access to public cloud infrastructure via the **Centre for Shared Services (CDU)**. **ZODII** in 2025 is expanding SME access to national cloud services.

Croatian entities are also **indirectly involved in the Important Project of Common European Interest (IPCEI) on Next Generation Cloud Infrastructure and Services**, although no national-level dissemination or coordination actions have yet been launched.

- **Data Analytics**

Croatia has emerged as a **top performer in the EU** for the adoption of data analytics. In 2023, **51.68% of enterprises** reported using data analytics, well above the **EU average of 33.25%**. SME adoption reached **50.72%**, while **83.91% of large enterprises** used such tools, reflecting a **33.19 percentage point gap** – narrower than the EU average of 39.72. The high level of uptake is partly attributable to the growing availability of real-time public data services, the mobilisation of EU funds for analytics software adoption, and the active role of EDIHs in providing training and testing environments.

- **Artificial Intelligence**

In contrast, AI adoption in Croatia remains at an earlier stage of development and **the country is lagging behind compared to its national trajectory.** In 2024, **11.76% of Croatian enterprises used artificial intelligence**, just below the **EU average of 13.48%**. Compared to 2023 (7.89%), this marks a **49.05% increase**, though the EU grew faster at 67.2%. SME usage stood at **11.31%**, while **28.36% of large enterprises** had adopted AI solutions, producing a **17.05 percentage point gap** – much smaller than the EU's 28.53 gap, indicating relatively balanced uptake across different-sized companies.

Recent policy efforts are beginning to address this lag. The **'Grants for Digitalisation'** (EUR 27.3 million) and a **voucher scheme for SME digitalisation worth EUR 9.95 million** support AI-related investment, alongside a **national AI-capable data infrastructure** launched in 2023. Still, the current national 2030

target of 30% AI uptake – far below the EU target of 75% – reflects a **low level of ambition** and suggests the need for stronger public-private partnerships, demonstration pilots, and sector-specific adoption strategies.

2024 recommendation: Increase the level of effort […] by supporting the development and deployment of trustworthy, secure and sovereign advanced technologies and solutions (AI/cloud/data).
Croatia made some efforts to address the recommendation through new policy actions in 2024. The roll-out of RRP-funded measures – including EUR 27.3 million for Grants for Digitalisation and EUR 9.95 million for the voucher programme – helped to stimulate uptake of cloud and AI tools, particularly among SMEs. In addition, the launch of a secure, sovereign AI data infrastructure at the CDU provides a national platform for AI model development and analytics. Despite this, AI adoption remains modest (11.76% vs 13.48% EU average), and the 2030 targets for AI and data analytics remain well below EU benchmarks. There is currently no dedicated national strategy to stimulate widespread adoption across sectors, nor are there targeted initiatives to deepen digital integration beyond basic uptake. Further efforts will be needed to scale deployment and ensure SMEs move from early adoption to full digital transformation.

Unicorns, scale-ups and start-ups

At the beginning of 2025, **Croatia had two unicorns**, with a 2030 national target of four. This figure remains unchanged from the previous year. While the ambition level remains limited, 2024 saw a broadening of national efforts to strengthen the investment landscape for high-growth and innovation-driven enterprises.

The **ICT sector in Croatia represents 5.26% of national gross value added**, close to the EU average of 5.5%. Notably, **business R&D expenditure in the ICT sector accounts for 34.27% of total R&D expenditure**, reflecting the sector's growing role in driving innovation. However, broader access to equity and venture capital financing remains limited. **Venture capital investment as a share of GDP is below the EU average**, and private equity investment fell sharply in recent years, indicating persistent financing constraints for high-growth firms.

To address these structural gaps, Croatia launched several financing instruments in 2024. **CVCi 2**, supported by the European Investment Fund, combines **EUR 60 million from ERDF** with **EUR 20 million in national co-financing**, while a new **EUR 80 million programme** was introduced for start-up support. These efforts complement existing instruments, including **EUR 70 million in innovation grants** and **EUR 210 million in vouchers** promoting business R&D collaboration. In addition, the **Vesna Deep Tech Venture Fund**, with a budget of EUR 40 million, aims to stimulate early-stage investment in deep tech sectors [12].

To support long-term capital development, Croatia initiated work on a **Strategic Framework for the Development of Capital Markets 2025-2030**, backed by diagnostic and benchmarking reviews completed in 2024. The draft framework and its accompanying action plans aim to improve investor incentives, legal certainty, and access to non-bank finance such as crowdfunding and equity instruments.

Meanwhile, **R&D tax incentives are being revised** to increase take-up by innovative firms and to simplify access for start-ups. A separate reform is targeting the development of a national acceleration

[12] European Commission. (2025). European Semester Annex on Innovation to Business: Croatia.

ecosystem and providing grant-based support for deep tech ventures. These are reinforced by the **Vesna Deep Tech Venture Fund**, which is offering EUR 40 million to early-stage firms in high-tech sectors.

Despite progress, Croatia still lacks a **dedicated national strategy for scale-ups and unicorn development**, and financing conditions remain well below the EU average. Venture capital penetration is still limited in scope, and regulatory hurdles – particularly around fund formation and investor participation – continue to affect the growth of the venture capital ecosystem.

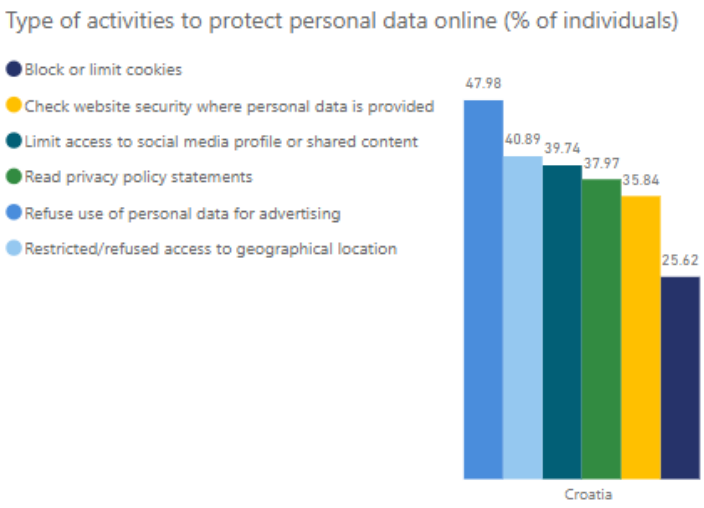
Entrepreneurial activity remains relatively high, supported by RRP-funded initiatives, targeted business support schemes, and platforms like **START** for digital company registration. However, the absence of a fully integrated policy framework for scaling firms may continue to hinder Croatia's capacity to produce high-growth, innovation-driven champions in the medium term [13].

2024 recommendation: Increase the level of effort to support the unicorns target, including by increasing the level of R&D in the ICT sector, improving access to finance and supporting the development and deployment of trustworthy, secure and sovereign advanced technologies and solutions.

Croatia made some efforts to address the recommendation through new policy actions in 2024. It continued implementing existing investment schemes and introduced several new financial instruments to support start-ups and deep tech ventures. However, the country still lacks a dedicated strategy for scale-ups and unicorn development, and structural barriers to late-stage financing and innovation scaling persist.

Strengthening Cybersecurity & Resilience

In 2023, **63.9% of individuals in Croatia took at least one precautionary action to protect their personal data online**, slightly below the EU average of 69.55%. Of these, **47.06% engaged in three or more actions**, suggesting above-basic digital safety skills. The most common action was **refusing the use of personal data for advertising purposes** (47.98%), while **only 25.62% changed browser settings to manage cookies**, indicating gaps in more advanced protective behaviours.



Croatian enterprises report a relatively high incidence of cyber-related disruptions. In 2024, **26.1% of enterprises experienced at least one ICT security incident**, compared to the EU average of 21.54%. The most frequent causes of unavailability were **hardware or software failures** (23.54%), while **external attacks** (e.g. ransomware or denial of service) were reported by 3.34% of enterprises, slightly below the EU average (3.43%).

[13] European Commission. (2025). ES Annex Making Business Easier: Croatia.

Data destruction or corruption due to malware or unauthorised access was rare (1.25%), and **Croatia recorded one of the lowest overall rates of incidents involving data disclosure**, whether through internal or external actions (2.01%, EU: 2.28%).

From a legal perspective, Croatia has now fully transposed the NIS2 Directive. The **new Cybersecurity Act** entered into force on 7 February 2024, repealing Article 41 of the Electronic Communications Act and updating the earlier 2021 legislation. It was followed by the adoption of the **Cybersecurity Regulation** (Official Gazette No 135/2024) on 30 November 2024, which establishes detailed obligations for **cybersecurity risk management, reporting, and the identification of essential and important entities**. This marks a major step forward in aligning Croatia's regulatory framework with EU requirements.

The national approach to cyber awareness and capacity building had also evolved by the end of 2024. In late 2023, the Croatian government designated the Croatian Academic and Research Network (CARNET) as the National Coordination Centre for Industry, Technology, and Research in Cybersecurity (NCC-HR), in line with Regulation (EU) 2021/887. In an earlier step, the Information Systems Security Bureau (ZSIS) had already been designated as the national authority for cybersecurity certification under Regulation (EU) 2019/881 (Cybersecurity Act).

In parallel, the national approach to cybersecurity awareness and capacity building was reinforced. In late 2023, CARNET was designated as the NCC-HR, in line with Regulation (EU) 2021/887. The NCC-HR coordinates a range of nationally and EU-funded initiatives, including the 'Deployment of NCC-HR' project, co-financed under the Digital Europe Programme with a total value of EUR 7.87 million. The project runs until 2028 and supports the development of professional cybersecurity skills, stakeholder coordination through a newly created Cybersecurity Competence Community, and cascade funding for innovation in cybersecurity. To ensure wide engagement, the NCC-HR also plans to organise regional Cyber Meet-ups in collaboration with local and regional authorities, targeting SMEs, institutions and academia. Croatia is also working with other Member States towards the development of the European Digital Infrastructure Consortia (EDIC) European Cybersecurity Skills Academy.

Additional national efforts include a cybersecurity voucher scheme and targeted SME support via the EDIH CROBOHUB++ centre, offering training, threat detection tools, and test-before-invest services.

Despite these efforts, Croatia still faces challenges in achieving widespread security readiness. The **relatively high incidence of service disruption in businesses**, combined with **low adoption of critical standards like IPv6**, signals the need for continued investment in enterprise-level cybersecurity infrastructure, staff training, and public digital literacy.

Concerning the deployment of secure internet standards, Croatia remains significantly behind the EU average in the roll-out of Internet Protocol version 6 (IPv6). In Q3 2024, only **4.0% of end users** in Croatia connected via IPv6, compared to the EU average of 37%. Server-side adoption is even lower: only **1.0% of servers** supported IPv6, against an EU average of 16%. Moreover, Croatia has experienced a **declining trend in IPv6 usage** among end users, down from 5.8% in Q3 2022. This stagnation and regression pose risks for scalability, security and interoperability, especially given the exhaustion of IPv4 addresses. Accelerating the deployment of IPv6 is essential to future-proof the national internet infrastructure and ensure compatibility with EU-wide digital services. **Domain Name System Security Extensions (DNSSEC)** is another important standard introducing authentication and integrity checks in DNS. In Croatia, the **DNSSEC validation rate was just 13% in Q3 2024**, substantially below the EU average of 43%, underscoring the need for internet providers and public platforms to further incentivise its adoption.

Protecting and empowering EU people and society

Empowering people and bringing the digital transformation closer to their needs

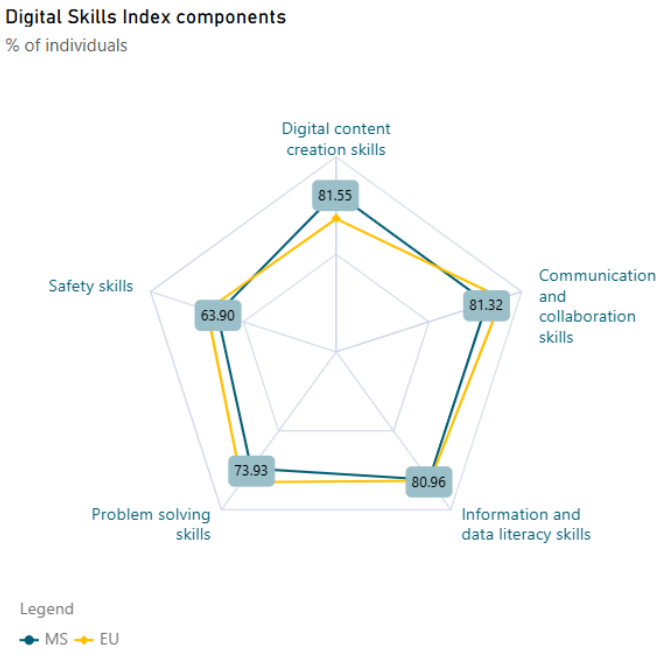
Croatia continues to face important digital inclusion challenges, with divides persisting on the basis of education level, age group, and rural-urban areas. However, strong progress has been made in expanding basic digital skills, promoting women's participation in ICT, and improving the accessibility of public digital services. Croatia is also reinforcing its efforts on media literacy, cybersecurity awareness, and protection against online risks, particularly for young people. Initiatives promoting safe use of digital technologies in schools and campaigns addressing disinformation have been strengthened, supporting a more inclusive and resilient digital transition. [Eurobarometer data on fake news, concerns, etc.]

Equipping people with digital skills

Basic Digital Skills

Croatia is at **58.95%** of population with at least basic digital skills (2030 national target: 80%), **above the EU average** of 55.56%. The value has improved steadily in recent years, but the pace of growth must be maintained to stay on track. Based on the 2023 level, Croatia would need to increase the share of digitally skilled individuals by approximately three percentage points per year to meet its 2030 goal. While this pace aligns with recent progress, **reaching the target is not yet guaranteed**, especially in light of persistent inclusion gaps.

- **Gender Gap**: 60.22% of men and 57.71% of women in Croatia reported at least basic digital skills, resulting in a gender gap of **2.51 percentage points**, slightly above the EU average of 2.33 pp.
- **Education Level**: Digital skills are strongly correlated with education. Among individuals with a higher education level, **81.46%** reported basic digital skills (above the EU average of 79.83%), while among those with a low education level, only **26.12%** did. This results in a gap of **32.83 percentage points**, considerably above the EU average gap of 21.95 pp.



- **Living Areas**: In rural areas, **50.13%** of Croatians have at least basic digital skills, which is above the EU rural average (47.50%). However, the rural-national gap remains at **8.82 percentage points**, closely mirroring the EU average.
- **Age Groups**: Croatian youth (16-24) are highly digitally proficient, with **86.33%** reporting at least basic digital skills, well above the EU average of 69.98%. In contrast, **only 17.86%** of individuals aged 65-74 have these skills – significantly below the EU average of 28.19%.
- **Digital Skills Index components**: Croatia performs below the EU average in four out of five competence areas, but stands out in **digital content creation**, with an **81.55% score**, well above the EU's 68.28%. The weakest area remains **safety skills**, where Croatia scores 63.90%, compared to the EU average of 69.55%.

Croatia continues to implement a comprehensive set of policy actions to support digital upskilling. A key initiative is the **voucher system for adult education and reskilling**, in operation since April 2022. As of early 2025, **over 19 000 vouchers** have been granted for digital skills acquisition, with **100+ accredited training programmes** offered across **150+ institutions** nationwide. Particular attention is given to the inclusion of **vulnerable groups**, such as the long-term unemployed, persons not in education, employment, or training (NEETs), and low-skilled adults.

The government is also reforming **primary, secondary, and higher education** to embed digital competences more systematically. The national curriculum is being updated to reflect AI-driven learning environments and smart recommendation systems. In schools, teacher training includes practical modules on **online safety**, **AI ethics**, and the responsible use of digital tools. In higher education, institutions are being equipped with new digital infrastructure, and staff are receiving support to design and deliver **modular digital content**, contributing to a system-wide increase in **digital maturity**.

To further support lifelong learning, Croatia is aligning its voucher system with the **Council Recommendation on Individual Learning Accounts** and is actively monitoring inclusion and equity metrics as part of labour market reforms. These initiatives are supported through a substantial **EUR 211 million allocation under the RRP**, covering components related to tourism, education, R&D and labour market. The plan includes reforms to improve **basic skills among pupils** through extended instruction time, and to strengthen the link between **vocational and adult education** and labour market needs. Dedicated actions also aim to **increase the attractiveness of ICT studies and research careers**, including through improved working conditions, simplified procedures, and enhanced promotion opportunities. Complementary investments promote **upskilling and reskilling across all generations**, including in **tourism**, **green**, and **digital sectors**, helping build an inclusive and future-ready workforce [14].

2024 recommendation: Continue the efforts on digital basic skills […] with a view to ensuring sufficient progress towards the 2030 targets.
Croatia continued implementing existing measures but did not take any new measures. In 2024, the national voucher scheme for reskilling remained active and exceeded 19 000 beneficiaries, while curriculum reform and teacher training in digital competence continued to advance. Inclusion remains a key focus, particularly for low-skilled adults and older citizens. Sustained investment will be needed to maintain momentum and close persistent gaps.

[14] European Commission, Recovery and Resilience Scoreboard: Thematic analysis Digital skills and education, 2024.

ICT specialists

In its roadmap, Croatia set an indicative 2030 target of around **10% of ICT specialists as a share of total employment**, with the figure standing at **5.0% in 2024**, on a par with the EU average. This marks a significant increase from 4.3% in 2023, reflecting a growth rate of **+16.3%**, far above the EU's +4.2%, which puts **Croatia on track with its national trajectory**.

The demand for digital professionals is expanding across sectors. As in other EU countries, **software and application developers** are the most sought-after ICT profile. However, Croatia diverges from the EU trend with exceptionally high demand for **field-based and infrastructure roles**. According to Eurostat web scraping data, **27.1%** of ICT-related job ads targeted **electronics and telecommunications installers and repairers** (vs 6.6% EU), and **18.5%** were for **telecommunications and broadcasting technicians** (vs 1.7% EU). These shares indicate a **strong domestic emphasis on technical implementation roles**, in addition to standard software and support functions.

In parallel, Croatia has recorded significant progress in **gender convergence**. The share of **female ICT specialists** increased from **17.5% in 2023 to 21.5% in 2024**, surpassing the EU average of 19.5%. This represents a year-on-year growth of +22.9%, compared to just +0.5% at EU level. These gains reflect the impact of targeted campaigns and scholarships, as well as national initiatives promoting women's participation in ICT. In 2025, Croatia presented the '**Women in Digital – Girls in ICT**' programme through the **Best Practice Accelerator** [15], inspiring other Member States to adopt similar early engagement actions.

While employment in the ICT sector is growing, Croatia continues to face **structural skills shortages and emigration pressures**. Employer surveys show that **43% of Croatian firms report difficulties hiring candidates with the right skills**, above the EU average of 38%. In the ICT field, this is linked to a mismatch between education output and labour market needs, and to the **continued outflow of skilled graduates** from the country [16].

Croatia's training and upskilling infrastructure remains underdeveloped. In 2024, only **20.44% of enterprises** provided ICT training to their employees, slightly below the EU average (22.29%) and declining from 2022. This downward trend could further exacerbate the mismatch between supply and demand for digital professionals.

To address these challenges, Croatia continues to implement several supporting measures such as **science, technology, engineering and mathematics (STEM) scholarship schemes** to support students enrolling in priority areas such as ICT and engineering, while public universities are encouraged to adapt **enrolment quotas** based on sectoral demand.

Despite these efforts, challenges remain in stabilising the domestic digital talent pipeline. The country still lacks a dedicated strategy to attract and retain international digital talent. A reform is under way through the **new Act on Scientific Activity and Higher Education**, which will allow quality scientists to be attracted from the EU and globally (including the diaspora), but this focuses on researchers rather than the broader digital workforce**.** The country still lacks a dedicated strategy to attract and retain international digital talent, and **brain drain of ICT professionals** remains a major

[15] The Best Practice Accelerator (BPA) is a platform that enables Member States to share successful measures and challenges encountered in their efforts to meet their Digital Decade targets and objectives. Best practices are available to all Member States via the BPA Repository and are showcased in regular workshops, currently focused on three thematic clusters: Digital Skills, Green IT, and the Uptake of Digital Technologies.
[16] European Commission. (2025). European Semester Annex Education and Skills: Croatia.

obstacle. While Croatia has succeeded in growing its base of ICT specialists and improving gender diversity, a more **systematic and demand-driven approach** will be needed to consolidate gains and achieve the 2030 targets.

2024 recommendation: Continue the efforts on […] ICT specialists with a view to ensuring sufficient progress towards the 2030 targets.
In 2024, Croatia continued implementing existing measures but did not take any new measures. The country recorded strong growth in the share of ICT specialists and in female participation, and reinforced incentives for ICT studies. However, challenges persist regarding the provision of ICT training, brain drain, and labour market mismatches, requiring sustained attention to fully meet the 2030 targets.

Key digital public services and solutions – trusted, user-friendly, and accessible to all

Regarding digital public services for citizens, in 2024 Croatia scored 75.16 (2030 national target of 100) after significant progress of +11.9%. The country is on track according to its national trajectory. In the cross-border category for digital public services for citizens, Croatia improved from 47.02 in 2023 to 53.81 in 2024, recording a growth rate of 14.4%, substantially higher than the EU's 4.3%. Nevertheless, it remains below the EU average of 71.28.

Regarding digital public services for businesses, Croatia scored 65.31 in 2024 (2030 national target of 100), showing negative growth of -1.3% and remaining well below the EU average of 86.23. The country is lagging behind compared to its national trajectory. In cross-border digital public services for businesses, the score declined from 36.11 in 2023 to 32.5 in 2024, contrasting with the EU's slight positive growth.

In terms of access to e-Health records, Croatia scored 86.55 in 2024 (2030 national target of 100), after modest growth of +1.2%, standing above the EU average of 82.7. This result confirms the good performance already observed in 2023 (85.57 compared to the EU's 79.12). Croatia is broadly on track with its national trajectory.

2024 recommendation: Take measures to increase the digitalisation of public services and improve the accessibility and user-friendliness of its services to citizens and enterprises.
In 2024, Croatia continued implementing existing measures but did not take any new measures. Progress was recorded in the digitalisation of citizens' services, improvements in access to e-Health records, and the advancement of interoperability initiatives supported by RRP funding. No new dedicated measures were introduced in the 2024 roadmap adjustment, and further efforts are needed to ensure comprehensive user-centric service delivery and to close remaining gaps with EU averages.

eID

Croatia has a nationally certified eID scheme, the eOI (electronic identity card), widely adopted for accessing public services. According to Eurostat, 36.7% of Croatian citizens used their eID to access online public services in 2023, close to the EU average of 36.14%. Usage is mainly focused on national services, with cross-border functionality still limited.

In the 2024 roadmap adjustment, Croatia reinforced its preparatory work to develop a national Digital Identity Wallet aligned with EU standards. A dedicated working group has been operational since 2021, coordinating legal, technical, and organisational aspects. Preparations include enhancing the eOI

system, expanding mobile-based access via the Certilia app, and promoting qualified electronic signatures.

As of early 2025, Croatia is not participating in the EU large-scale pilots for the European Digital Identity Wallet but continues to align its infrastructure with EU standards, planning future cross-border support.

Digitalisation of public services for citizens and businesses

Croatia is making steady progress towards the EU 2030 target of 100% availability of key digital public services. **Although the share of e-Government users declined slightly from 88.46% in 2023 to 82.86% in 2024, it remains significantly above the EU average of 74.71%.** While no new measures were introduced in the 2024 roadmap adjustment, Croatia confirmed that major initiatives supported under the RRP would continue, including the expansion of the State Cloud, the creation of a national digital mobile platform, and the enhancement of public sector interoperability.

Simplification and interoperability remain central pillars. The development of a central register for public authorities is under way to improve data quality, promote the Once Only principle, and enable efficient information exchange, also supporting Common European Data Spaces.

Additionally, a one-stop-shop platform has been established through the Croatian RRF to harmonise helpdesk services for citizens and businesses, promoting the use of electronic signatures and national digital identities.

In terms of digital sovereignty, Croatia is strengthening its public sector cloud infrastructure under the RRP (EUR 1.3 billion investment) to ensure secure data management and trusted connections with European platforms.

Despite this progress, challenges persist regarding full system integration and user-centric service design, which will be critical to achieving the 2030 objectives.

e-Health

Croatia maintained strong performance in 2024 in access to e-Health records, scoring 86.55, above the EU average of 82.7. However, with modest growth of +1.2%, the country is lagging behind compared to its national trajectory.

No new e-Health measures were introduced in the 2024 roadmap adjustment. Efforts continue under major RRP-funded projects, notably the upgrade of the **Central Health Information System (CEZIH)**, the expansion of the **e-Prescription** and **e-Referral** platforms, and the deployment of hospital information systems. Croatia is also aligning its e-Health infrastructure with the European Health Data Space, preparing for future cross-border healthcare services.

Croatia's score increased slightly in 2024. **12 of the 13 data categories** investigated in the benchmark study are now made available in a timely manner – **all except medical images**. Citizens can now access their health data via a **mobile application**, improving user accessibility. While previously only **outpatient psychiatric care** was included under mental health services, a new project is under way to **expand the scope to additional mental health service providers** Due to this broader definition, **the overall connectivity rate of the category has dropped below 60%**, as many newly included providers are not yet connected or supplying data to the national access service. **All other provider categories**, except **geriatric nursing homes**, are connected and supplying relevant health data. In terms of authorised access, **legal guardians** may access the data of their wards, but **citizens cannot yet delegate**

access to another person of their choice, as there is no general legal or technical framework enabling this functionality.

2024 recommendation: (i) Introduce a legal basis and provide the technical functionality for authorised persons to access electronic health data on behalf of others; (ii) Make the medical images data type available to citizens through the online access service; (iii) Offer a mobile application for citizens to access their electronic health records.

In 2024, Croatia continued implementing existing measures but did not take any new measures.

(i) **Partially addressed**. Legal guardians can access the data of their wards, but no legal or technical functionality exists for broader delegation by data subjects.

(ii) **Not addressed**. Medical images are still not accessible via the Health Portal.

(iii) **Partially addressed**. A mobile-friendly solution exists and citizens can access their health data via an app, but no unified national mobile application has been rolled out.

Building a safe and human centric digital environment and preserving our democracy

In Croatia, online participation in political and civic life is relatively high and shows an upward trend. In 2024, 27.86% of people used the internet to participate in consultations, vote, or share opinions on civic or political issues. This share is above the EU average (20.45%), and marks a steady improvement compared to 23.38% in 2022 and 20.08% in 2023.

In 2023, more than half of Croatian internet users declared that they had encountered untrue or doubtful information online. According to the latest data, 57.77% of individuals reported encountering such content on internet news sites or social media, a figure significantly above the EU average of 49.25%. Among these individuals, 27.27% checked the truthfulness of the information, suggesting a moderate level of critical evaluation. Young people between 16 and 24 years of age emerged as those more likely to report exposure (80.52% vs 60.92% of adults between 25 and 64 years of age) and to verify information (57.13% vs 25.55% of adults). In terms of gender, males (65.28%) reported a higher exposure to doubtful content than females (50.46%), but verification rates were similar (28.45% for males and 26.12% for females).

Available data also show that in Croatia, the proportion of individuals encountering hostile or degrading messages online remains below the EU average. In 2023, 24.13% of individuals encountered such content, compared to an EU average of 33.5%. An interesting pattern is observed in the age breakdown: exposure among youth (16-24) was lower (21.47%) than among adults (25-64) (27.72%), contrary to trends observed in most other Member States. A modest gender gap was noted, with 26.13% of males and 22.18% of females reporting exposure to such content.

2024 reports of the Adria Digital Media Observatory (ADMO) provide detailed insights into the most frequent topics subject to disinformation in Croatia. Research shows that **Russian disinformation** efforts have been particularly prominent in narratives about Russia's war of aggression against Ukraine, with disinformation ecosystems involving 21 supranational clusters across Croatia and neighbouring countries, significantly influenced by Serbian pro-Russian media [17]. Moreover, systematic information manipulation was observed through the Facebook profiles of Russian embassies, including the Russian Embassy in Croatia, which particularly intensified following the start of the full-scale invasion of

[17] ADMO Report: Mapping Ukraine War Disinformation Ecosystem in Croatia and Slovenia, 2024. p. 3

Ukraine [18]. In addition, a considerable share of anti-Ukraine disinformation disseminated in Croatia originates from fringe news sites, predominantly based in Serbia [19].

In the climate domain, a separate mapping exercise revealed the existence of 10 supranational clusters disseminating climate-related disinformation, including Croatian actors. Although the number of actors involved in climate disinformation was lower compared to COVID-19 and the military aggression in Ukraine, the presence of pseudo-media at the centre of the ecosystem was confirmed [20].

Research into the reporting on the **Israel-Hamas conflict** found that Croatian mainstream media largely relied on reputable international and national sources such as AFP, Reuters, BBC, and HINA during the first three days of the conflict. However, a small number of cases were found where sources previously labelled as purveyors of disinformation were used [21].

Looking at policy responses, Croatia's initiatives mainly focus on promoting media literacy and strengthening fact-checking ecosystems. **In 2024, several digital platforms (Google, YouTube, Facebook, TikTok) maintained or introduced fact-checking and media literacy campaigns in Croatia**, including Google's Fact Check Explorer and YouTube's Hit Pause campaign. However, ADMO highlighted that these global initiatives had limited local adaptation and that user engagement with fact-checking tools remained low. Croatia's primary fact-checking partner remains **Faktograf.hr**, with cooperation expanding only moderately to other institutions.

At the institutional level, the **ADMO**, coordinated by the University of Dubrovnik and supported by partners including GONG, AFP, and several faculties of the University of Zagreb, plays a significant role in fostering media literacy and research activities against disinformation. These efforts contribute to Croatia's implementation of the Digital Services Act (DSA). The **Croatian Regulatory Authority for Network Industries (HAKOM)** has been officially designated as the Digital Services Coordinator (DSC), responsible for overseeing the application of the DSA**. Nonetheless, ADMO monitoring revealed that public awareness of DSA-related user rights remains low and that further outreach efforts are necessary.**

Finally, regarding the protection of minors, Croatia has not yet introduced specific legislation on mandatory online age verification or parental controls. However, ongoing media literacy initiatives supported by ADMO and its partners target younger audiences and aim to strengthen critical thinking skills to better resist disinformation [22].

Croatia has transposed the relevant obligations of the **Audiovisual Media Services Directive** (AVMSD) into its national legislation. Under the Electronic Media Act and the **Ordinance on the Protection of Minors in the Electronic Media** (*Narodne Novine* (NN); Official Gazette of the Republic of Croatia) No 106/2022), video-sharing platforms under Croatian jurisdiction are required to implement user age verification systems or other technical measures to restrict access to content that could seriously harm minors' physical, mental, or moral development, such as gratuitous violence or pornography. However, in practice, most age verification systems rely primarily on basic methods, such as self-declared date of birth, with limited use of more secure technologies like ID verification or AI-based age estimation. Moreover, while parental control tools exist on some platforms, their availability and quality vary considerably, and no harmonised national requirements have been introduced so far. Unlike other

[18] ADMO Report: Russian State Actors on Facebook and Foreign Information Manipulation and Interference in the Adriatic and Balkan Regions, 2024. p. 3–5
[19] ADMO Report: Content Analysis of Disinformation and Narratives Related to the War in Ukraine, 2024. p. 3
[20] ADMO Report: Mapping Climate Disinformation Ecosystem in Croatia and Slovenia, 2024. p. 3-5
[21] ADMO Report: Journalistic Sources on the Israel/Hamas Conflict in the Croatian Media, 2024. p. 3–55.
[22] ADMO Report: Report about Social Media Initiatives for Empowering Users, the Research Community and the Fact-Checking Community in Croatia, 2024. p. 4-7.

Member States that are moving toward detailed technical standards for age verification, Croatia has not yet adopted additional regulations or frameworks, such as mandatory pre-installed parental controls or coordination with the development of the **European Digital Identity Wallet** ('mini-wallet'). The minimum age for providing valid consent to digital services remains set at 16 years, in line with Croatia's implementation of the General Data Protection Regulation (GDPR) [23].

The 2023 data on online interactions in Croatia reveal a mixed picture, with a lower proportion of individuals perceiving hostile and degrading online messages compared to the EU average. However, a significant proportion of individuals in Croatia still encountered potentially misleading information online. On a positive note, a notable share of young people (16-24) has been taking steps to verify the accuracy of online content. Overall, the findings suggest that **Croatia has been making progress in promoting digital literacy and critical thinking and highlight the importance of continued efforts to support individuals in developing these skills and to promote a safe and informed online environment**.

[23] European Audiovisual Observatory (Council of Europe), The protection of minors on VSPs: age verification and parental control, 2023. p.76-78

Leveraging digital transformation for a smart greening

Croatia's **RRP** includes major investments to support the **revitalisation, construction and digitalisation of the energy system**, contributing to the **decarbonisation of the energy sector** (Component C1.2, R1-I1). These measures aim to modernise the electricity transmission network, enabling a better balance between generation and consumption points. The digitalisation of the energy infrastructure is expected to **increase the security of energy supply** and **reduce the environmental impact** of the accompanying infrastructure [24].

In addition, Croatia is also modernising water management systems, aiming to improve resilience to climate change through digital monitoring and leakage reduction measures. However, systematic nature-based solutions and large-scale climate-proofing measures are not yet widely applied, and comprehensive monitoring and evaluation frameworks remain to be fully developed [25]?.

In the **telecom sector**, sustainability and energy efficiency are increasingly recognised as priorities. Operators have initiated **voluntary green transition actions**, including using **renewable energy sources** and **afforestation programmes**. However, **these efforts are not yet coordinated under a dedicated national green telecom policy** or a broader strategic framework linking digitalisation to climate objectives.

In addition, measures already mentioned in previous chapters also contribute to supporting the green and digital transitions. The **State Cloud** includes enhanced functionalities for more efficient and sustainable data management. Similarly, the establishment of the **Croatian Competence Centre for Semiconductors (CROCCS)**is expected to foster the development of greener ICT hardware solutions, supporting energy efficiency in the digital ecosystem.

In terms of **consumer behaviour** towards environmentally friendly ICT usage, Croatia's performance remains mixed. In 2024, only **12.51%** of individuals considered **energy efficiency** important when purchasing ICT devices (EU average: 19.35%), and only **0.70%** considered **eco-design** important (EU average: 12.04%). Instead, **price (58.33%)** and **device performance (54.74%)** remain the dominant purchasing criteria.

Concerning device end-of-life practices, Croatia reported **lower recycling rates** than the EU average: **12.4%** of old desktop computers, **7.99%** of old laptops/tablets, and **5.59%** of old mobile phones were recycled (EU averages: 14.66%, 11.31%, and 10.93%, respectively). However, **reuse practices** are stronger: **33.56%** of Croatians reported **selling or giving away** their old mobile phones, compared to an EU average of 18.05%, reflecting an emerging culture of circular economy practices.

Overall, Croatia's digital contribution to the green transition is becoming stronger, particularly through large infrastructure investments in the energy sector and early telecom green actions. However, further progress is needed in **coordinating sustainability efforts**, **raising consumer awareness**, and **embedding environmental criteria into digital policies**.

[24] European Commission, Recovery and Resilience Scoreboard, Digital Public Services Thematic Analysis, 2024.
[25] European Commission. (2025). European Semester, Annex Climate: Croatia.

Croatia

2024 recommendation: Develop a coherent approach to twinning the digital and green transitions:

- Promote improvements in energy and material efficiency of digital infrastructures, in particular data centres.

- Support the development and deployment of digital solutions that reduce the carbon footprint in other sectors, such as energy, transport, buildings, and agriculture, including the uptake of such solutions by SMEs.

- Monitor and quantify the emission reductions of the deployed digital solutions in line with the relevant EU guidance and with the support of the methodology developed by the European Green Digital Coalition, in view of future policy development, as well as attracting relevant financing.

In 2024, Croatia made some efforts to address the recommendation through new policy actions in 2024. Croatia made some efforts through RRP-supported digitalisation of the energy network, but no coherent national strategy or monitoring framework has been established yet. Voluntary green actions in the telecom sector remain fragmented. Further efforts are needed to fully address the recommendation.

Annex I – National roadmap analysis

Croatia's national Digital Decade strategic roadmap

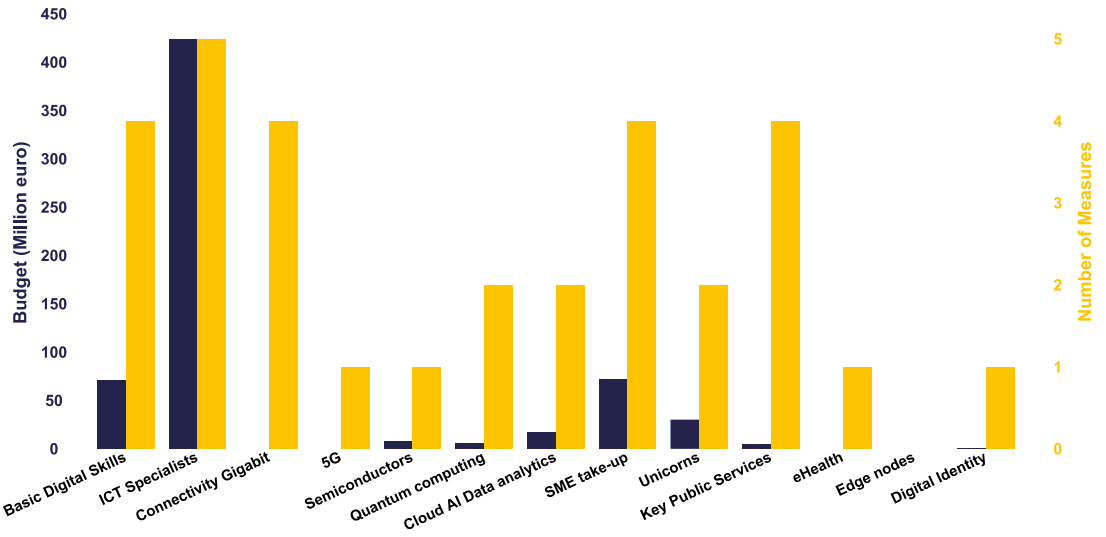
Croatia submitted an adjustment to its national roadmap in January 2025, following the 2024 recommendations. The adjustment clarified the national approach, updated 5G coverage targets, and refined the measure set, without fundamentally revising the strategic directions. It also improved alignment with the Digital Decade objectives, enhanced stakeholder consultations, and updated links to policy.

- **Targets:** Croatia partially addressed the recommendation to raise ambition. The 2030 target for overall 5G coverage remains aligned with the EU target (100%), while a new mid-band 5G coverage target (75% by 2030) was introduced. This is below the EU ambition but reflects national circumstances. No changes were made to targets for ICT specialists or AI/data analytics adoption. A target for edge node deployment, required under the Digital Decade, is still missing.
- **Measures:** The measure repository was strengthened, with updated and more detailed descriptions across connectivity, skills, AI/data, cloud, and digital public services. However, no fully new measures were introduced.
- **Digital Rights and Principles:** Mapping of measures to the Digital Decade objectives and the European Declaration on Digital Rights and Principles was improved.
- **Consultation:** The stakeholder consultation process was enhanced, including a kick-off conference in September 2024 and continuous coordination with relevant state bodies and associations, such as the Croatian Employers' Association and the Croatian Chamber of Economy.

While Croatia's adjusted roadmap covers the majority of Digital Decade targets, the absence of a target for edge node deployment highlights an important gap. Overall, the Croatian roadmap includes 31 measures with a budget of EUR 635 million (equivalent to 0.74% of GDP).

Croatia

Measures and budget in national roadmap [26]



Croatia's adjustment improves the structure and clarity of the roadmap. The strengthened measure descriptions, enhanced mapping to objectives, and update of 5G targets are positive developments. However, the lack of new measures, the limited ambition for key digital transformation areas such as AI/data adoption and ICT specialists, and the absence of an edge node target remain significant challenges. Funding levels also remain modest relative to the scale of needs, notably for AI, cloud, and rural connectivity. While the adjustment confirms a solid baseline, further efforts are needed to maintain momentum, particularly in driving the twin transition, SME digitalisation, and the adoption of advanced technologies.

[26] When referring to national roadmaps, the data used in this report are those declared by the Member States in their national roadmaps, on the basis of the Commission's guidance (C(2023) 4025 final). Data might reflect possible variations in reporting practices and methodological choices across Member States. No systematic assessment of the extent to which Member States followed the guidance has been carried out.

Annex II – Factsheet on multi-country projects (MCPs) and funding

Multi-country projects and best practices

Croatia is a member of the three established EDICs: the Alliance for Language Technologies EDIC, the Local Digital Twins towards the CitiVERSE EDIC and the EUROPEUM EDIC. In addition, Croatia is working towards setting up EDICs in the area of connected public administration, cybersecurity skills, agri-food and genomics. Croatian entities are indirect partners in the IPCEI on Next Generation Cloud Infrastructure and Services (IPCEI-CIS). Croatia is a participating state of the EuroHPC Joint Undertaking (JU) and the Chips JU.

Croatia has contributed to the Best Practice Accelerator [27] by sharing a measure in the framework of the Digital Skills cluster (**Women in Digital – Girls in ICT**).

EU funding for digital policies in Croatia

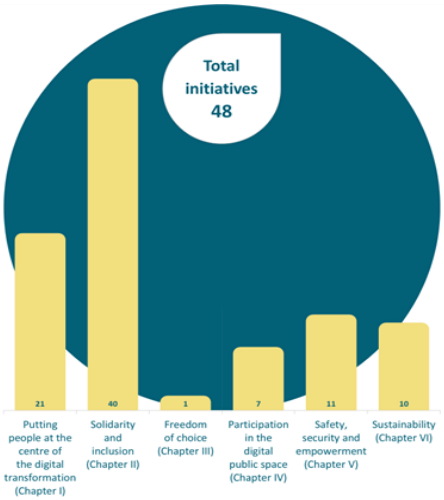
Croatia allocates 20% of its total recovery and resilience plan to digital (EUR 1.4 billion)[28]. In addition, under cohesion policy, EUR 755 million (representing 9% of the country's total cohesion policy funding), is dedicated to advancing Croatia's digital transformation[29]. According to JRC estimates, EUR 1.4 billion directly contribute to achieving Digital Decade targets (of which EUR 0.9 billion comes from the RRF and EUR 0.5 billion from cohesion policy funding)[30].

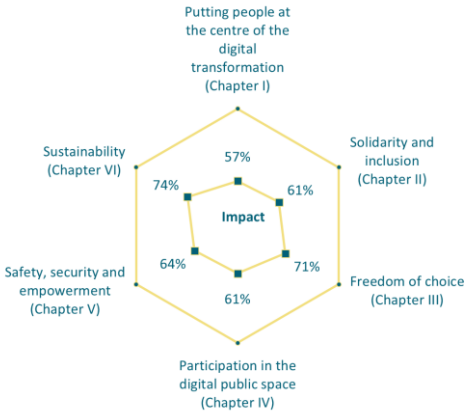
Digital investments are focused on digital skills, digitalisation of public services, connectivity, and support for business digitalisation.

The total amount of funding mobilised remains consistent with the 2024 report, confirming the strong alignment between EU financial support and Croatia's digital transition priorities.

[27] The Best Practice Accelerator (BPA) is a platform that enables Member States to share successful measures and challenges encountered in their efforts to meet their Digital Decade targets and objectives. Best practices are available to all Member States via the BPA Repository and are showcased in regular workshops, currently focused on three thematic clusters: Digital Skills, Green IT, and the Uptake of Digital Technologies.
[28] The share of financial allocations that contribute to digital objectives has been calculated using Annex VII to the Recovery and Resilience Facility Regulation. Last data update: 16 May 2025.
[29] This amount includes all investment specifically aimed at or substantially contributing to digital transformation in the 2021-2027 Cohesion policy programming period. The source funds are the European Regional Development Fund, the Cohesion Fund, the European Social Fund Plus, and the Just Transition Fund.
[30] Joint Research Centre, Nepelski, D. and Torrecillas, J. Mapping EU level funding instruments 2021-2027 to Digital Decade targets – 2025 update, Publications Office of the European Union, Luxembourg, 2025, JRC141966. Last data update: 10 March 2025.

Annex III – Digital rights and principles[31]





Activity on digital rights and principles (figure 1)

Croatia has been relatively active in implementing digital rights and principles, with 48 initiatives overall and 7 new initiatives launched in 2024, showing notable progress towards its commitments. Croatia is most active in the area of solidarity and inclusion. There is room for improvement, especially with regards to a fair digital environment where less activity has been identified.

Impact of digital rights initiatives (figure 2)

Quantitative impact indicators, developed by a support study, illustrate the level of implementation of digital rights initiatives on the ground.

Based on available data, they estimate the impact of measures implemented by key stakeholders in Croatia (mainly national government) and how these are perceived by citizens.

The indicators suggest that Croatia is most successful in implementing commitments related to sustainability. Croatia should review and strengthen efforts in areas where the impact of digital rights initiatives appears to be limited despite relative activity, notably on putting people at the centre of the digital transformation.

According to the Special Eurobarometer[32] 'Digital Decade 2025', 58% of citizens in Croatia think that the EU protects their digital rights well (a 2% increase since 2024). This is above the EU average of 44%. Citizens are particularly confident about getting more freedom of expression and information online (73%, above the EU average of 60%). They are most worried that their right to a safe digital environment and content for children and young people is not well protected (47%, below EU average of 48%).

[31] Based on a study to support the Monitoring of the Implementation of the Declaration on Digital Rights and Principles, available here. For a more detailed country factsheet accompanying the study, click here.
[32] Special Eurobarometer 566 on 'the Digital Decade' 2025: https://digital-strategy.ec.europa.eu/en/news-redirect/883227