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Digital Decade 2025 country reports

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

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European Commission

DIGITAL DECADE 2025
COUNTRY REPORTS

Estonia

Estonia

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Executive summary

Estonia is positioning itself as a leader in the digitalisation of public services. However, the country lags EU average in connectivity and the digitalisation of SMEs, while has achieved full access to e-Health records before 2030.

In its national roadmap adjustment, Estonia shows a high level of ambition in its contribution to the Digital Decade having set 14 national targets, of which 93% are aligned with the EU 2030 targets. The country is following its trajectories very well with 100% of them being on track (considering 2024 trajectories defined for 8 KPIs out of 8 analysed). Estonia addressed 100 % of the 12 recommendations issued by the Commission in 2024, either by implementing significant policy changes (8%) or making some changes (92%) through new measures.

Estonia focuses on digital sovereignty, through its emphasis on government resilience. The country has put measures in place to ensure that it can continue to be digitally governed beyond its geographical borders in various disaster scenarios. Estonia's roadmap recognises that the country's current challenges require not only introducing new digital measures, but also making sure that well-established digital services function well and are secure. Although Estonia lags behind the EU in terms of overall very high capacity (VHCN) and 5G coverage, it excels in 5G coverage in sparsely populated areas. Cybersecurity continues to be important, as demonstrated by the country's new National Cybersecurity strategy 2024-2030. This strategy prioritises safeguarding digital infrastructure, protecting the country from cyber threats and increasing cybersecurity cooperation.

Digital Decade KPI (1)	Estonia				EU		Digital Decade target by 2030	
	DESI 2024 (year 2023)	DESI 2025 (year 2024)	Annual progress	National trajectory 2024 (3)	DESI 2025	Annual progress	EE	EU
Fixed Very High Capacity Network (VHCN) coverage	76.9%	76.3%	-0.9%	77.0%	82.5%	4.9%	100.0%	100%
Fibre to the Premises (FTTP) coverage	76.9%	76.3%	-0.9%	77.0%	69.2%	8.4%	100.0%	-
Overall 5G coverage	87.5%	91.5%	4.6%	90.0%	94.3%	5.9%	100.0%	100%
Edge Nodes (estimate)	5	10	100.0%	0	2257	90.5%	5	10000
SMEs with at least a basic level of digital intensity (2)	-	71.2%	3.1%	-	72.9%	2.8%	90.0%	90%
Cloud	52.6%	-	-	-	-	-	75.0%	75%
Artificial Intelligence	5.2%	13.9%	167.6%	14.0%	13.5%	67.2%	75.0%	75%
Data analytics	25.6%	-	-	-	-	-	75.0%	75%
AI or Cloud or Data analytics	60.6%	-	-	-	-	-	-	75%
Unicorns	2	2	0.0%	-	286	4.4%	5	500
At least basic digital skills	62.6%	-	-	-	-	-	80.0%	80%
ICT specialists	6.7%	7.2%	7.5%	7.0%	5.0%	4.2%	10.0%	~10%
eID scheme notification		Yes						
Digital public services for citizens	95.8	96.1	0.3%	99.0	82.3	3.6%	100.0	100
Digital public services for businesses	98.8	97.5	-1.3%	100.0	86.2	0.9%	100.0	100
Access to e-Health records	97.5	100.0	2.6%	99.0	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 the version 4 of the Digital Intensity Index, that is comparable with the DII value from DESI 2023 (referring to year 2022) for the calculation of the annual progress. It is not comparable to the national trajectory that 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 DESI2025 (year 2024)

According to the special Eurobarometer on 'the Digital Decade' 2025, 79% of Estonian citizens consider that the digitalisation of daily public and private services is making their lives easier. On the action of the public authorities, 88% consider it important to counter and mitigate the issue of fake news and disinformation online, and on competitiveness, 69% 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

Estonia is falling behind the EU average in infrastructure indicators (VHCN, 5G), but shows impressive 5G coverage in sparsely populated areas. It is one of the Member States that experienced the biggest expansion of coverage in the 3.4-3.8 GHz band in 2024. Estonia has relied on Recovery and Resilience Facility (RRF) measures to expand VHCN coverage (to be completed in 2025). The country is taking initiatives to increase rural coverage by completing the identification of their white areas (areas without connectivity), which will serve as the foundation for a public consultation (expected to be launched mid-2025). The adoption of advanced technologies by Estonian enterprises paints a mixed picture: the share of those taking up cloud or AI is higher than the EU average, but the share of those taking up data analytics is lower. Across the three technologies, large enterprises consistently reported higher levels of uptake compared to SMEs.

Protecting and empowering EU people and society

Estonia is prioritising the development of its citizens' digital skills through its Digital Agenda 2030. The country performs well in basic digital skills, with small gaps in gender and education levels, and notable digital skills among rural residents and younger generations. Estonia has developed an action plan to equip people with basic digital skills and has focused on educating civil servants and increasing digital skills training, particularly in rural areas. Estonia has identified that managers who lack an understanding of their responsibilities in cybersecurity and risk assessment, and who do not sufficiently align their digitalisation initiatives with the strategic aims of their respective areas, can hinder overall digital transformation. The country's share of ICT specialists in employment is one of the highest in the EU, and its share of female ICT specialists is the highest in the EU. Estonia is well on its way to achieving its digital transformation goal with initiatives such as research on future digital skills needs and collaboration with the University of Tartu to ensure future ICT specialists are enrolled in relevant training. However, the demand for ICT professionals continues to grow, and there is a lack of highly skilled and advanced digital specialists across sectors. Estonia's performance on digital public services and access to e-Health records continues to surpass the EU average, and has reached the Digital Decade 2030 target. Despite this, Estonia will face the challenge of ensuring its digitalised services are up to date with the latest technologies.

Leveraging digital transformation for a smart greening

According to Estonia's Digital Agenda 2030, the country aspires to become the world's greenest digital government; however, it currently lacks a systematic approach or strategy to achieve this goal. Estonia launched a Sustainability Reporting Tool and relies on private sector initiatives that aim to increase the lifespan of ICT devices and to reduce overall energy consumption.

National digital decade strategic roadmap

Estonia submitted a fully revised national Digital Decade roadmap on 27 March 2025. It reports on the consultation of stakeholders and addresses a limited number of the roadmap recommendations

issued in 2024. In the updated roadmap, Estonia includes 13 new targets and one revised target, all in line with the EU's level of ambition. Although it provides some information on planned activities to achieve the country's targets, it lacks detailed information on the budget allocated to each area and the specific aims and scope of the different activities. The roadmap puts a strong emphasis on quantum computing, EU-level cooperation and digital skills and puts a new emphasis on high-performance computing, resilience and security. However, the green transition is reflected less in the roadmap.

Funding & projects for digital

Estonia allocates 24% of its total recovery and resilience plan to digital (EUR 208 million)[1]. In addition, under cohesion policy, EUR 373 million, representing 11% of the country's total cohesion policy funding, is dedicated to advancing Estonia's digital transformation[2].

Estonia is a member of the Local Digital Twins towards a CitiVERSE European Digital Infrastructure Consortium (EDIC). The country is a participating state of the EuroHPC Joint Undertaking (JU) and of the Chips JU.

Estonia has not yet presented any measure in the framework of Digital Decade's Best Practice Accelerator[3].

Digital rights and principles

According to a support study, Estonia has shown rather limited activity in implementing the **European Declaration on Digital Rights and Principles**, with 39 initiatives overall and 6 new initiatives launched in 2024. Estonia is most active in the area of protected, safe and secure digital environment. Less activity has been identified with regards to fair digital environment. Measures in the area of freedom of choice appear to have most impact on the ground, in contrast to those addressing Participation in the digital public space.

[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

- **Connectivity**: Continue and establish new measures that target enhancing VHCN, and 5G coverage.
- **Digital skills**: Introduce digital skills measures targeted to mid-level managers to be able to lead the digitalisation process for their employees and enterprises.
- **ICT specialists**: Continue to implement measures to educate ICT specialists to fill the current gap.
- **SMEs**: Sustain and complement activities to improve digitalisation and uptake of advanced technologies and give special attention to SMEs.
- **Digitalisation for public services**: Improve the useability of the digital public services to ensure that they are accessible to all as well as to ensure that its services are up to date.
- **Green**: Implement a coherent green digitalisation strategy to be able to keep up with the country's ambition of being the world's greenest digital government.
- **Cybersecurity:** Continue efforts in cybersecurity to address the evolving and increasing threats. Ensure continuation in the implementation of cybersecurity classes.

A competitive, sovereign and resilient EU based on technological leadership

Estonia is progressing beyond mere digitalisation. To remain competitive Estonia recognises that the country's current challenges require not only introducing new digital measures, but also making sure that digital services that are already well-established function well and are secure. To continue offering high-quality digital services Estonia intends to introduce a management model that will ensure continuous updates and maintenance of its digital services (it is currently attempting to achieve this with the latest national e-services design system, VEERA).

Government resilience has become a clear priority for Estonia. The majority of Estonia's services are digitalised and this has also created a mutual interdependency between different (non-digital and digital) services. It has raised new challenges: what is the cause of action if the digital solutions fail? As a result, **Estonia is analysing disaster recovery scenarios** (including low-probability and high-impact scenarios) and improving understanding of operational issues. Based on this, Estonia is looking how to provide critical services and ensure safe digital infrastructure from beyond its geographical borders to its citizens both within the country and abroad. To promote its government resilience Estonia is setting up data embassies in foreign countries to store critical information, including back-ups, outside the country in case its critical infrastructure is compromised.

The Estonian ICT sector represented 5.97% of GDP in 2022, which is a decrease from 6.72% in 2020[4]. R&D personnel in the ICT sector represented 45.29%, making them a leader in the EU despite a decline compared to the previous year measured (49.42% in 2021).

The use of AI among Estonia's businesses more than doubled in 2024 from the previous year (from 5.19% in 2023 to 13.89% in 2024). Estonia relies on AI start-up accelerators which have launched 30 enterprises; more than 19 new AI-based products/enterprises have entered the market. In addition to accelerators numerous workshops, tech validations, demos and awareness raising activities have been carried out to foster the uptake and development of Ai in the private sector. Estonia is also promoting the use of AI in the public sector.

Estonia has a very strong start-up scene but in 2024 it saw a decline in funding, fewer people establishing start-ups and fewer people employed by start-ups; which can be attributed broader macroeconomic challenges like inflationary pressures and rising interest rates that have raised the price of money, including venture capital (VC). Europe has overall witnessed venture capital pullback and the trend of becoming more conservative as well as focusing on some specific tech domains. The situation is aggravated by a talent shortage in the sector. On the other hand, VC investments into deep tech including AI is showing promising trend. Deep Tech now accounts for 28% of all VC funding in Europe, a record high, novel AI, LLMs, AI chips etc being the leading tech domains. Estonia is the leader in deep tech VC investments in the Baltic states.

According to the 2025 Eurobarometer[5], 86% of Estonians think that building efficient and secure digital infrastructures and data processing facilities should be a priority for the public authorities.

[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] Special Eurobarometer 566 on 'the Digital Decade' 2025: https://digital-strategy.ec.europa.eu/en/news-redirect/883227.

Building technological leadership: digital infrastructure and technologies

Estonia lags behind the EU in total very high capacity networks (VHCN) and overall 5G coverage, yet it excels in 5G coverage in sparsely populated areas and 5G spectrum assignment. Estonia's growth rates in these areas are generally lower than the EU's, except for 5G coverage in the 3.4-3.8 GHz band. Estonia has a very active communication.

Connectivity infrastructure

Estonia is at 76.27% of VHCN and fibre to the premises (FTTP) coverage for all households (its national target is to reach 100% by 2030) and stands below the EU average for VHCN (82.49%) and above the EU average for FTTP (69.24%). In Estonia VHCN coverage equates to FTTP coverage. The country is on track according to its national trajectory. Estonia showed a decline of -0.9% for VHCN and FTTP coverage. This decline can be attributed to drops in DSL, VDSL, VSDL 2 vectoring caused by network decommissioning. For households in sparsely populated areas, Estonia's FTTP coverage was 67.79% in 2023 and 71.84% in 2024, both higher than the EU's 52.55% and 58.78%, respectively. Estonia's growth rate of 6.0% for this category is lower than the EU's 11.9%. For households in sparsely populated areas, Estonia's VHCN coverage was 67.79% in 2023 and 71.84% in 2024, both higher than the EU's 55.59% and 61.89%, respectively. Estonia's growth rate of 6.0% for this category is lower than the EU's 11.3%.

Estonia's 5G coverage is at 91.50.% (with a national target of 100% by 2030) after growth of 4.6% in 2024; it is below the EU average (94.35%). The country is on track according to its national trajectory. Estonia's growth rate of 4.6% for total 5G coverage is lower than the EU's 6.0% in 2024. For households in sparsely populated areas, Estonia's 5G coverage was 86.99% in 2023 and 92.31% in 2024, both higher than the EU's 71.10% and 79.57%, respectively. Estonia's growth rate of 6.1% for this category is lower than the EU's 11.9%.

Estonia's 5G coverage in the 3.4–3.8 GHz band for all households was 43.68% in 2023 and 69.53% in 2024, with the latter being higher than the EU's 67.72%. Estonia's growth rate of 59.2% for total 5G coverage in this band is higher than the EU's 32.6%. For households in sparsely populated areas, Estonia's 5G coverage in the 3.4–3.8 GHz band was 40.62% in 2023 and 49.24% in 2024, both higher than the EU's 15.86% and 26.19% respectively. Estonia's growth rate of 21.2% for this category is lower than the EU's 65.1%.

Estonia's 5G pioneer bands spectrum assignment was 99.17% in both 2023 and 2024, higher than the EU's 73.4% and 74.63% respectively. Estonia had no growth between 2023 and 2024, while the EU's growth was 1.7%.

Estonia's broadband take-up indicators show a mixed picture. In 2023, only 35.5% of fixed broadband subscriptions were at speeds of 100 Mbps or higher, compared to the EU's 65.9%. By 2024 this figure had risen to 48.29%, still below the EU's 71.88%. However, Estonia's growth rate of 36.0% outpaced the EU's 9.1%. For subscriptions at speeds of 1 Gbps or higher, Estonia's share was much lower than the EU's. In 2023 it was 0.17%, rising to 0.31% in 2024, compared to the EU's 18.47% and 22.25% respectively. Estonia's growth rate of 82.4% was higher than the EU's 20.5%. The share of 5G SIM cards in the population in Estonia was 6.64% in 2023, rising to 23.42% in 2024, both lower than the EU's 21.7% and 35.56% respectively. Estonia's growth rate of 252.7% was higher than the EU's 63.9%.

Estonia

Estonia's broadband take-up indicators are below the EU average, but the country is showing strong growth in all areas. The share of 5G SIM cards in the population and the share of fixed broadband subscriptions at speeds of 100 Mbps or higher, and 1 Gbps or higher, are all lower than the EU average. However, Estonia's growth rates in these areas are higher than the EU's.

The Estonian Consumer Protection and Technical Regulatory Authority (ECPTRA) addresses competition in the telecoms market by implementing *ex ante* regulation. According to its last round of market analysis, ECPTRA regulates the market for physical infrastructure access (PIA) at national level and the markets for wholesale local and central access (WLA/WCA) at subnational level, with one telecom operator enjoying significant market power. The ECPTRA plans to deregulate the fixed call termination rate (FTR) and mobile call termination rate (MTR) markets in 2025 (currently *ex ante* regulated).

VHCN and FTTP

In its adjusted roadmap Estonia proposed a new target and trajectory for VHCN, and FTTP in line with the EU target of 100%.

In Estonia, the main measures to support VHCN development have been the RRF support scheme (2022-2025), and the Local initiative village networks (2023-2025). The RRF support scheme received EUR 23 million to cover 11 184 addresses (598 addresses were covered during 2024), and the Local initiative village network received EUR 800 000 for 5 projects and 100 addresses (1 project with 25 addresses was finalised).

In 2024 Estonia did a **mapping of white areas** (in collaboration with the national regulatory authority and telecom operators) and prepared the launch of its new support VHCN support scheme. This scheme will have a budget of EUR 45 million (funded by the ERDF) and will launch a public consultation with operators to define white areas; it will have its first calls for proposals in May-June 2025.

Estonia also launched a study of the cost of broadband infrastructure in market failure areas. The study identified that 122 990 addresses were without 100 Mbit/s fixed network coverage, and that to cover them all with fibre would cost EUR 828 million (EUR 6 730 per address), while covering them with 5G fixed wireless, using 4 987 towers, would cost EUR 1.5 billion (11 881 per address). The study put forward an optimal scenario to cover 85 349 of the addresses (69%) with fibre (costing EUR 403 million, or EUR 5 000 per address) or with 5G fixed wireless only at efficient sites covering 109 079 addresses (88.69%), requiring 665 new towers for a total EUR 215 million, or EUR 1 897 per address. In both scenarios, 31% (FTTH) or 15% (5G FWA) would not be covered.

2024 recommendation on connectivity infrastructure: (i) Continue the ongoing efforts to support VHCN, FTTP and 5G rollout, including by fostering private investment and by stimulating take-up. (ii) Ensure sufficient access of new players to spectrum for innovative business-to-business (B2B) and business-to-consumer (B2C) applications and encourage operators to speed up the deployment of 5G stand-alone core networks.
Estonia made efforts to address the recommendation through new policy actions in 2024. Estonia has made progress through its mapping, the study and the RRF measures mentioned above. However, there is still work left to do to continue efforts to ensure spectrum access for innovative B2B and B2C applications.

The ECPTRA reported that it will not be involved in the **copper switch-off** process. The low-capacity wholesale market is not regulated and the switching-off process will a decision for the incumbent operator. However, it is expected that the technical switch-off will be achieved by 2030, with the copper areas that have been upgraded to vectoring being the last to be switched off.

The ECPTRA reports a competitive market with 4 active operators, one of which is dominant. The largest operator's cable internet subscriber base is declining, while the second largest operator's is increasing. Adjusted for purchasing power, the price of Estonian internet access is below the average in the EU (despite a general increase of 6% in telecom service prices, driven by general inflation). From the low number of complaints to the ECPTRA (around 100) it can be inferred that the quality is quite high.

Estonia relies on several **submarine connectivity cables**. In 2024 it experienced 3 incidents with these cables, but none led to any lasting disturbance.

5G

In its adjusted roadmap Estonia proposed a new target and trajectory for 5G in line with the EU target of 100%. Despite Estonia's below EU average performance, the growth in its progress makes it likely that it can reach its target by 2030.

The ECPTRA reports a competitive market with 3 active operators, each with a similar market share.

Estonian operators are on track to close their **3G networks**. One operator closed 3G in 2023, a second in 2024, and the last operator is expected to close its 3G network in 2025. It is expected that 2G will be closed in 2030.

All main 5G spectrum licences have been issued. The ECPTRA reports that there will be an increase of private networks in the 3.8 GHz and 26GHz bands.

The ECPTRA reports that there are no concrete plans to launch 6G.

2024 recommendation on connectivity infrastructure: (i) Continue the ongoing efforts to support VHCN, FTTP and 5G rollout, including by fostering private investment and by stimulating take-up. (ii) Ensure sufficient access of new players to spectrum for innovative business-to-business (B2B) and business-to-consumer (B2C) applications and encourage operators to speed up the deployment of 5G stand-alone core networks.
Estonia has made efforts to address the recommendation through new policy actions in 2024. The 5G stand-alone networks are undergoing testing and development, and the groundwork has been laid (including the deployment of edge nodes for latency-sensitive applications). Operators estimate that stand-alone networks will be deployed within 2 years.

Semiconductors

In its adjusted roadmap Estonia does not report on semiconductors.

2024 recommendation on semiconductors: Develop strategies and measures for semiconductors.
Estonia has made effort to address the recommendation through new policy actions in 2024. Estonia follows a market-driven approach and therefore does not intend to develop a national strategy on semiconductors. March 2025 Estonia launched a semiconductor competence centre, based in a state-owned company, but the centre composes of a consortium of partners. The project

will finish in 2029. The centre's target audience will be beneficiaries of all kinds of technical product developer that use semiconductors in their products. The centre will verify compliance with technical requirements for semiconductors and provide testing. The project budget over the next four years is EUR 2.4 million and is 50% funded by the State budget and 50% from the Digital Europe Programme.

Edge nodes

According to the Edge Node Observatory, Estonia is estimated to have deployed a total of 10 edge nodes by 2024, an increase of 100% since 2023. This is a doubling (5 additional edge nodes) of the amount estimated for 2023 (which was 5; this number has been revised since SDDR 2024).

In its new roadmap, Estonia states that it is monitoring the development of data centres to report on the progress of edge nodes. The country repots to have three operational sites in Tallinn, Suurupi, and Hüüru. At this stage country keeps monitoring the situation, additional national initiatives are not planned to allow for organic market development.

2024 recommendation on edge nodes: As edge computing is an important component of AI, future network deployment, and the Internet of Things, consider edge node deployment when creating investment programmes and strategies in these areas.

Estonia made some efforts to address the recommendation through new policy actions in 2024 (see also the section on 5G). In 2024 Estonia completed a study on the topic, researching how and where to deploy edge nodes. The study determined that due to Estonia's size and geographical location, edge nodes would only be necessary in 2 or 3 bigger cities within the next 5-6 years.

Quantum technologies

For the next three years Estonia will prioritise increasing access to high-performance computing (HPC), improving user training and advancing computational capacity to support the country's scientific, technological and economic goals. In its new roadmap Estonia states that investing in the development of HPC capacity and the academic network is an important goal for the upcoming years. As a consequence, Estonia intends to enhance the societal and economic impact of research, development and innovation by supporting progress with modern data infrastructure, to increase awareness and skills related to HPC services among public and private sector stakeholders, to bring service to end-users, to expand HPC in the public and private sectors, and to combine international resources with Estonia's local infrastructure.

2024 recommendation on quantum: Develop strategies and measures for quantum computing.

In 2024, Estonia continued the implementation of existing measures but did not take any new measures. Estonia continues to be an active member of the EuroQCI initiative to build a pan-European quantum infrastructure, a partner in the Nordic-Estonian Quantum Computing e-Infrastructure Quest (NordiQuest), and a participant in the Estonian Scientific Computing Infrastructure (ETAIS). Estonia has adopted a cybersecurity strategy that sets out goals for the adoption of quantum technologies and the development of a supporting ecosystem.

Supporting EU-wide digital ecosystems and scaling up innovative enterprises

In Estonia, digital transformation among small and medium-sized enterprises (SMEs) has been steadily advancing. However it still does not match the overall EU performance. Estonia is ahead of the EU average in the uptake of cloud but lags behind in AI and data analytics**.** Improving the overall take-up of AI, cloud, and data analytics could give Estonia its competitiveness an edge and have a spillover effect on the digitalisation of its businesses.

SMEs with at least basic digital intensity

In Estonia, 71.2% of SMEs showed at least a basic level of digital intensity after growth of 3.1% annually between 2022 and 2024; this figure is slightly below the EU average of 72.91%. Estonia has an annual growth rate of 3.1% (2022 is the last comparable year that used a similar methodology for measuring the digital intensity of enterprises). This uptick positioned Estonia marginally below the EU average of 72.91% in 2024. However, 35.42% of SMEs in Estonia reached a high or very high digital intensity, a figure somewhat higher than the EU average of 32.66%. This indicates solid progress in advanced digital engagement.

In its new adjusted roadmap Estonia proposed a new target and trajectory for the digitalisation of businesses in line with the EU target of 90%. The digitalisation of businesses in Estonia is showing a positive trend, putting it slightly above its EU peers. Based on its current progress and performance it seems likely that Estonia will reach its target.

The **Estonian Research and Development, Innovation and Entrepreneurship Strategy 2021—2035** and the Estonia 2035 report lay the framework for the future digitalisation of businesses. The Estonian Research and Development, Innovation and Entrepreneurship Strategy 2021—2035 has the objective to dedicate 1% of its GDP to R&D.

The Estonian digital innovation hub AI and Robotics Estonia (AIRE) continues to play a relevant role in supporting the digitalisation of businesses. AIRE provides a test-before-invest service to the Estonian manufacturing sector and its value chain. It receives EUR 2 million annually (combined national State and EU funding), has 270 clients and impacts 15% of the total Estonian industry turnover.

Estonian government focuses on providing grants for businesses to achieve economic impact through strategic digitalization and accelerate their digitalisation process. The Digital Action Plan grant helps companies create strategic plans for digital transformation. Applications for Digital Action Plan grants began in 2024. Since the launch of the measure, 210 companies (110 micro and small enterprises, 59 medium-sized enterprise and 41 large enterprises) have prepared a digital action plan with the help of grants in total of 1,5 million euros. According to the initial assessment, the support measure should remain open until 2027 with the total budget of 2,5 million euros. Digital Transformation Support assist automating and integrating advanced technologies and robotics with the total budget of 56 million euros. The support is available for all sectors, but the focus is on industries such as manufacturing, mining and logistics. The main beneficiaries of the grant scheme are SMEs. Approximately 220 SME digital investments have been financed under the measure. The grants scheme was terminated in May 2025 due to the budget running out. The eCMR Development grant promotes the creation of electronic consignment notes for logistics, improves efficiency and compliance. Grant focused on both software platform development and service delivery. In 2022, six SMEs were supported with a total of €1 million to develop electronic consignment note (e-CMR) data exchange platforms. The e-waybill integration support has been available since 2024, and so far, 120 companies have been supported with a total of €1.8 million. The call for applications is open until September 2025. The Real-Time Economy Solutions for Piloting grant support large scale pilots and

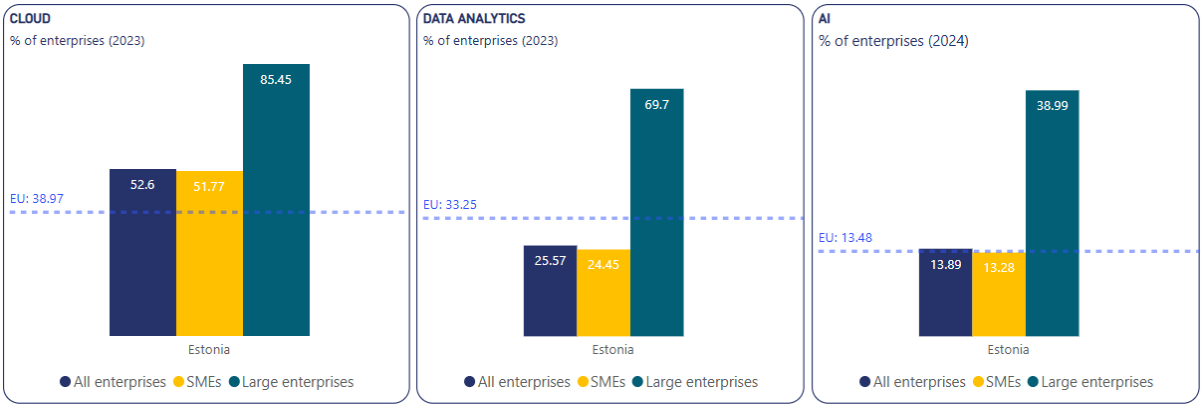
software development, enabling business to create innovative, real-time digital solutions tailored to their needs. Piloting grant was closed in the end of 2024 and 41 companies were supported in total grant of 3,4 million euros.

A new support measure covering real-time economy solutions will be launched in the second half of 2025 to promote innovation and digitalisation among businesses of varying digital maturity. With a total budget of approximately €11 million, the measure targets both SMEs and larger companies. SMEs will receive support for adopting and implementing their first digital solutions, with the help of digitalisation mentors. For mid-level digitally capable companies, the focus is on process digitalisation and automation. Larger companies or companies with higher digital maturity will be supported in developing interoperable integrated solutions within and between companies. Software and service providers will be supported in creating and deploying new business software solutions. The measure also supports data-driven reporting tools as well as the development and application of data economy use cases.

2024 recommendation on digitalisation of SMEs: Continue work on digitalising SMEs especially for data analytics and AI.

Estonia made some efforts to address the recommendation through new policy actions in 2024
For the digitalisation of SMEs, and increased uptake of data analytics and AI, Estonia relies on policies and measures previously introduced, many of which were completed in 2024. See each separate section for more detail.

Take up of cloud/AI/data analytics



According to the latest data available (2023), 3 out of 5 enterprises (60.59%) in Estonia used AI technologies, cloud computing services or data analytics technologies, exceeding the EU average of 54.7%. Drilling deeper into the figures, the uptake among SMEs was slightly lower, at 59.83%, while large enterprises had a significantly higher adoption rate of 90.3%. This indicates a difference in uptake of 30.47 percentage points between SMEs and large enterprises in Estonia, which is in line with the gap at EU level.

The adoption of cloud and data analytics was not measured in 2024 and nor was there a figure available for the three technologies combined in that year.

In 2023, Estonia recorded a cloud uptake of 52.6%, significantly above the EU average of 38.97%. Among SMEs, a little more than one in two enterprises (51.77%) used cloud services, whereas a much higher share of large enterprises, 85.45%, adopted such services. This accounts for the gap in uptake

of 33.68 percentage points between SMEs and large enterprises in Estonia, which is consistent with the EU level gap.

The latest available data shows that 25.57% of enterprises in Estonia adopted data analytics in 2023, which is below the EU average of 33.25%. However, there was a relatively discrepancy between the adoption rate among SMEs (24.45%) when compared with large enterprises (69.7%). This resulted in a difference of 45.25 percentage points between SMEs and large enterprises, which was higher than the EU gap of 39.72 percentage points.

In 2024, 13.89% of enterprises in Estonia used AI technology, in line the EU average of 13.48%. This was more than double the figure for 2023 (5.19%), thus marking a very considerable increase in AI use among Estonian enterprises. A notable fact was that, in 2024, SMEs had an uptake rate of 13.28%, whereas large enterprises had a higher rate: 38.99%. This resulted in a difference of 25.71 percentage points between SMEs and large enterprises, which was lower than the difference of 28.53 percentage points for EU-level figures.

In 2022 SMEs in Estonia generated 48.2% of the total value added in the economy, whereas large enterprises contributed 20.8%. In particular, SMEs constituted about 97.7% of enterprises with more than 10 employees, while large enterprises represented 2.3%.

In conclusion, Estonia demonstrated mixed results in the adoption of cloud computing, data analytics and artificial intelligence technologies. While cloud uptake was significantly above the EU average, the adoption of data analytics and artificial intelligence lagged behind. Across all three technologies, large enterprises consistently reported higher levels of uptake compared to SMEs, in line with broader EU trends. Considering the high number of SMEs relative to large enterprises and the fact that they contribute nearly half of the country's economic value added, these disparities in adoption rates underline the importance of addressing digital transformation among smaller businesses to support their integration into the digital economy.

- **Cloud**

In its adjusted roadmap Estonia proposed a new target and trajectory for cloud in line with the EU target of 75%.

In its roadmap Estonian does not present any measures specifically dedicated to cloud, only measures targeted towards the digitalisation of businesses that may include cloud; see the section on SMEs with at least basic digital intensity.

- **Data Analytics**

In its new adjusted roadmap Estonia proposed a new target and trajectory for the digitalisation of businesses in line with the EU target of 75%.

In its roadmap Estonian does not present any measures specifically dedicated to data analytics, only measures targeted towards the digitalisation of businesses that may include data analytics; see the section on SMEs with at least basic digital intensity.

- **Artificial Intelligence**

In its adjusted roadmap Estonia proposed a new target and trajectory for the adoption of AI in line with the EU target of 75%.

As mentioned in Estonia's adjusted roadmap, The Technopol AI Development Programme, launched in 2022-2025, continues to guide the AI scene. The **AI development programme** has been launched and will focus on industrial companies and start-ups in the environmental, health and energy sectors.

The AI start-up incubator has launched 30 enterprises, and more than 19 new AI-based products/enterprises have entered the market. The programme will continue until 2027 with another 30 start-ups.

Estonia is promoting the use of AI in the public sector. AI adoption support was provided to over 30 public sector organisations, and 172 AI-based solutions have been implemented in the public sector. In the public sector the adoption of generative AI was prioritised through more than 15 pilot projects.

Estonia is placing an emphasis on **preserving its language by integrating Estonian into AI models.** AI language models are facing difficulties in learning small languages as there is not enough data. To combat this issue, Estonia has shared nearly four billion linguistic datasets with a leading tech company in the digital sphere to improve functions such as voice assistants, chatbots and translations tools.

Unicorns, scale-ups and start-ups

At the beginning of 2025, Estonia had 2 unicorns, which is the same number as last year. Estonia has given birth to 10 unicorns.

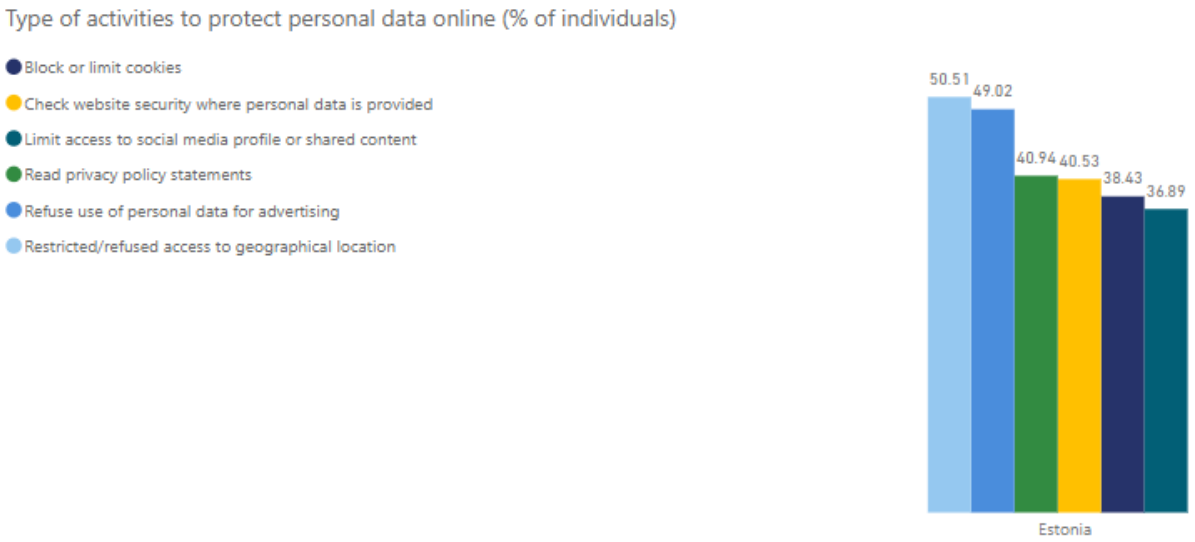
In its adjusted roadmap Estonia proposed a new target and trajectory for unicorns, aiming to have 5 unicorns by 2030.

In 2024 the start-up scene in Estonia was characterised by DeepTech's continued momentum, but at the same time a decline in investment in the Estonian start-up sector. DeepTech accounted for 63% of the Estonian start-up sector in 2024 and 17% of the sector's workforce. DeepTech companies raised EUR 206.2 million (63% of investment in the sector) across 20 deals. The Estonian government launched a EUR 100 million defence tech fund that will increase the development of new defence-oriented DeepTech start-ups. At the same time, Start-up Estonia reports a decline in investment of 23% from 2023 to 2024 for Estonian start-ups; the annual investment volume in 2024 was the lowest in the last five years. This decline is partly due to the general trend of less venture capital activity worldwide.

Start-up Estonia **states in its yearly report that 14 396 individuals were employed by start-ups, a decrease of 1.4% from 2023.** Estonia continues to report a shortage of talent in the sector.

Estonia also reports a decrease in the formation of new start-ups (four times fewer were established compared to the previous 3-4 years). As a result the Estonian government has focused on supporting certain sector-specific accelerator programmes in areas such as health, DeepTech and clean tech, through initiatives such as NATO Diana (launched last year). Additionally, Estonia has chosen to look beyond its national ecosystem and to prioritise collaboration with the Nordic countries, mainly Sweden and Finland, to launch a pre-accelerator (expected to launch in 2025).

Strengthening Cybersecurity & Resilience



In Estonia almost three quarters of people have digital safety skills above a basic level. 74.97% of individuals reported taking at least one action to protect their personal data online in 2023, exceeding the EU average of 69.55%. Of note was the fact that 50% engaged in three or more actions (and therefore could be considered as having digital safety skills beyond a basic level). The most common action was restricting or refusing access to geographical location, with 50.51% of individuals taking this measure; limiting access to social media profiles or shared online content was the least frequent measure taken, by 36.89% of people.

Estonian enterprises tend to experience more cyberattack-related incidents but employees are less aware of their ICT security-related obligations compared to the EU average. The number of enterprises that experienced ICT security incidents leading to unavailability of ICT services as a result of attacks from outside (such as ransomware or denial-of-service attacks) increased slightly in Estonia, from 3.06% in 2022 to 3.53% in 2024. This is marginally above the EU average (3.43%). However, Estonian enterprises are more prone to incidents resulting from hardware or software failures (18.63%) than their EU peers (17.97%). In terms of measures taken, 90.85% of enterprises deployed some ICT security measures (compared with the EU average of 92.76%) but only 54.89% of enterprises made their employees aware of their obligations in ICT security-related issues, which was below the EU average (59.97%).

Estonia is slightly above the EU average in the rollout of the secure Internet Protocol version 6 (IPv6) for end-users. As regards the deployment of secure internet standards, Estonia is slightly above the EU in the rollout of IPv6 for end-users (39%, compared with an EU average of 36%) and is significantly below the EU average on the server side (6%, compared with 17% for the EU). IPv6 is an important protocol as it ensures the scalability, stability and security of the internet. The deployment of this new version is increasingly urgent, as traditional IPv4 addresses have been long depleted. Domain Name System Security Extensions (DNSSEC) is also an important standard to be rolled out as it introduces security features to DNS. In Estonia, the DNSSEC validation rate (i.e. verification of the authenticity of responses sent by name servers to clients, using a digital signature technology) is 67% (Q3 2024), above the EU average of 47%.

According to the Digital Decade Eurobarometer 2025, 80% of Estonians think that an improved cybersecurity, better protection of online data and safety of digital technologies would facilitate their daily use of digital technologies.

Estonia's new national cybersecurity strategy for 2024-2030, 'Cyber-conscious Estonia', places a new emphasis on safeguarding digital infrastructure, protecting its institutions and citizens from cyber threats, and increasing cybersecurity cooperation.

In its adjusted roadmap Estonia identifies increasing cyber risks as one of its main challenges for the country's overall progress in digitalisation.

The Estonian Information System Authority (RIA) reports almost a doubling in the number of cybersecurity incidents, increasing from 3 314 in 2023 to 6 515 in 2024. Phishing and scam websites made up most of the incidents (4 224) and increased by 250% compared to the previous year.

In February 2024 Estonia had its largest data breach in history. An Estonia-based pharmacy company had its loyalty card systems hacked and the leak included nearly 700 000 personal identification codes, over 400 000 email addresses, and tens of thousands phone numbers and home addresses. Despite the breach, no lasting impact has been documented.

Estonia's geographical and geopolitical situation affects Estonian cybersecurity. RIA reports an increased number of incidents targeting government institutions, local authorities and the security and defence sectors.

Estonia reports that it has implemented the 5G Cybersecurity toolbox.

Protecting and empowering EU people and society

Empowering people and bringing the digital transformation closer to their needs

Estonia is putting a lot of attention on the development of its citizens' digital skills. In its renewed digital agenda (intending to be published during the summer of 2025) Estonia is identifying four target groups: vulnerable people (the young, those who are unemployed and not in education or training, the older population and people with low digital literacy), civil servants and general workforce (identifying the needs for a digitalised workforce), ICT professionals and leaders (people in senior positions in either the public and the private fields).

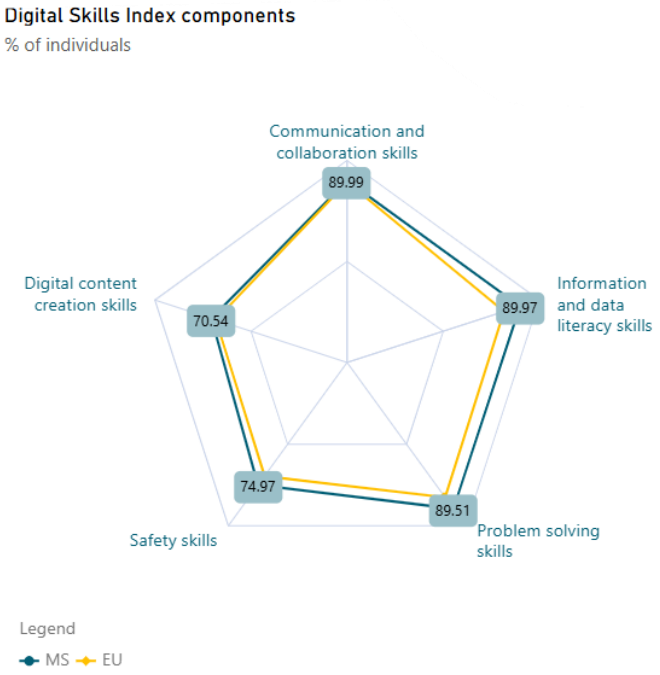
According to the 2025 Eurobarometer, 84% of Estonians think that accessing public services online will be important for their daily life in 2030. Concerning human support to help access and use digital technologies and services, 76% consider it would improve their daily use of digital technologies, and 82% think public authorities should consider it important to ensure that people receive proper human support to help them adapt to the changes in their lives brought about by digital technologies and services.

Estonia

Equipping people with digital skills

Basic Digital Skills

Estonia's digital skills profile is strong, with evidence of inclusive growth across different dimensions. According to data from 2023, 62.61% of Estonia's population has basic digital skills (the national target for 2030 is 80%), which is higher than the EU average of 55.56%. While there are no figures available for 2024, detailed breakdowns of the 2023 data provide a more granular perspective.



- **Gender gap:** there is almost no gender gap in digital skills in Estonia: 63.16% of men and 62.09% of women are digitally skilled. The difference between these figures is 1.07 percentage points, which is half the 2.23 percentage-point difference for the EU as a whole.
- **Education level:** among those with higher education in Estonia, 71.81% have at least basic digital skills, which is less than the EU average of 79.83%. Of those individuals with a medium level of education, 54.58% have a basic level of skills; the difference between this group and the national average is only 8.03 percentage points, much less than the corresponding figure of 21.95 percentage points for the EU overall. This small variation suggests that education level is a less significant driving factor in digital skills in Estonia.
- **Living areas:** 56.99% of rural dwellers in Estonia have at least basic digital skills, which is higher than the EU average for rural areas, at 47.50%. The gap between rural areas and the overall national level is 5.62 percentage points, which is less than average gap for the EU.
- **Age groups:** of the different age groups in Estonia, 16 to 24-year-olds have the most digital skills at 86.84%, well above the EU average of 69.98%. Those in the 65 to 74-year-old range have fewer skills, coming in at 22.67%, which is under the EU average of 28.19%.
- **Digital Skills Index components:** Estonia scores well in the Digital Skills Index, above the EU average in all five skill areas. It does best in communication and collaboration skills, at 89.99%, which is close to the EU average. The area with the lowest score is digital content creation at 70.54%, but this is still above the 68.28% in the EU as a whole.

Estonia exhibits a high level of digital skills across its population, with particularly good communication and collaboration abilities. The country shows small gaps in gender and education levels, and while there is room to help older Estonians improve their digital skills, the overall picture is one of solid digital competency.

In its adjusted roadmap, Estonia increased its target for the basic digital skills of the population from 60% to 80% in line with the EU target.

Estonia is in the process of developing an action plan focusing on basic digital skills and ICT specialists. The plan will set out to ensure that there are no overlaps of initiatives between different ministries nor any uncovered areas. It is estimated that the action plan will be launched by late summer 2025.

An emphasis is put on educating people with low digital skills, and people living in rural and remote areas. At the end of 2024, as a part of the Estonian government's action plan (in cooperation with an external training partner), e-learning material was created and will be introduced in autumn 2025 through 20 one-day seminars will be held across the country for people with low digital skills. **Estonia is putting an emphasis on educating civil servants in digital skills.** Digital skills development is fragmented, and lacking coordination across the government sector to address gaps and to create basic literacy and advanced skills of the civil servants. To tackle this, Estonia has published Digital State Academy learning hub and organised training sessions to specifically strengthen ICT management skills, digital services management and development competencies and improve the skills of IT project managers. In 2024, 2 500 central government employees received training in data and AI, and a data sector training programme for internal trainers was launched.

Estonia identifies mid-level managers competencies on planning and managing comprehensive digital transformation should be strengthened. Managers who lack an understanding of their responsibilities in cybersecurity and risk assessment, and who do not sufficiently align their digitalisation initiatives with the strategic aims of their respective areas, can hinder overall digital transformation. This is because they may not fully understand how emerging technologies and smarter use of data can be implemented and how these solutions can be beneficial.

2024 recommendation on basic digital skills: Continue implementing initiatives to improve digital skills and ensure that no one is left behind.
The MS made some efforts to address the recommendation through new policy actions in 2024. Through the measures discussed above Estonia is implementing initiatives to further improve digital skills among various groups.

An emphasis on is put on educating people with low digital skills and people who live in rural and remote areas. At the end of 2024, as a part of the Estonian government action plan (in cooperation with an external training partner), e-learning material was created. In Autumn 2025 there will be 20 one-day seminars will be held across the country for people with low digital skills.

ICT specialists

The number of ICT specialists in Estonia represents 7.2% of total employment in the country (with a national target of 10% by 2030) after a growth of 7.46% in 2024; this stands above the EU average of 5.0%. The country is on track according to its national trajectory. In 2023 the figure was 6.7% nationally and 4.8% at EU level. The growth rate is almost double that observed at EU level (4.2% in 2024). This trend is particularly visible among female ICT specialists. In 2023, 26.8% of ICT specialists in Estonia were female, higher than the EU's 19.4%. The figure rose to 27.6% in 2024, which is the highest proportion in the EU (where the average was 19.5%). Estonia's growth rate of 3.0% in this area outperformed the EU's 0.5%.

In 2022, 18.78% of enterprises with 10 or more employees in Estonia provided ICT training, lagging behind the EU's 22.37%. By 2024, this figure had risen to 21.05%, still below the EU's 22.29%. However, Estonia's annual growth rate of 5.9% outpaced the EU's -0.2%. This indicates a positive trajectory in ICT training provision, albeit one starting from a lower base.

Estonia's ICT training provision and ICT specialist workforce show a mixed picture. While the country lags behind the EU average in terms of enterprises providing ICT training, it has a higher annual growth rate. Estonia's ICT specialist workforce, particularly the share of female ICT specialists, is notably higher than the EU average and shows a higher growth rate. This suggests a strong potential for Estonia to further develop its ICT sector.

In terms of labour market demand, Eurostat experimental statistics based on web scraping show that in Estonia, the profiles of 'software and applications developers and analysts' are the most sought after, representing 47.3% of online job advertisements for ICT specialists (58.0% at EU level). Three types of profile are more wanted more frequently in Estonia than in the EU in average: 'information and communications technology service managers' (20.2% of online job advertisements for ICT specialists, versus an EU average of 3.8%), 'information and communications technology operations and user support technicians' (13.5%), and 'database and network professionals' (10.2%).

Estonia is working to anticipate the digital skills needed across various sectors in the future. The country is preparing a study to determine what digital skills will be needed in the labour market (e.g. supporting the adoption of generative AI solution for SMEs) and the results will inform plans and measures to address this skills gap.

In its roadmap Estonia identifies the shortage of highly skilled digital specialists across the sector as a hindrance to achieving a digital society. This scarcity is seen as leading to high competition and slowing down digitalisation efforts. In 2024 a survey found that if Estonia does not prioritise the upskilling of its workforce, this will ultimately harm the country's competitiveness.

2024 recommendation on ICT-specialists: Continue measures aiming at increasing the number of more senior ICT specialists (higher level of experience) and continue improving gender balance.
The MS made some efforts to address the recommendation through new policy actions in 2024. Through the measures discussed above and in the chapter on digital skills, Estonia has fulfilled this recommendation. Measures are being taken to increase the number of more senior ICT specialists; it is too soon to be able to determine whether these have led to any results, however. Estonia is relying on previously introduced measures to continue improving the gender balance.

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

Estonia's digital public services and access to e-health records continue to outperform the EU average. The country is on track according to its national trajectory. In 2023, Estonia's total score for **digital public services for citizens** was 95.83, surpassing the EU's 79.44; in 2024 it reached 96.12, still above the EU's 82.32. The country is on track to its target according to its national trajectory. The growth in this figure in Estonia in 2024 was 0.3%. For cross-border digital public services for citizens, Estonia scored 97.38 in 2023 and 94.64 in 2024, in both cases higher than the EU's 68.37 and 71.28 respectively. But Estonia's performance did decrease by 2.8%.

In the realm of digital public services for businesses, Estonia's total score was 98.75 in 2023 and 97.5 in 2024, in both years exceeding the EU's 85.42 and 86.23. The country is on track to meet its target according to its national trajectory. However, the figure in Estonia decreased by 1.3% in 2024. For cross-border digital public services for businesses, Estonia scored 97.5 in 2023 and 95.0 in 2024, both higher than the EU's 73.13 and 73.76. This represented a decrease of 2.6% in Estonia.

Regarding access to e-health records, Estonia's total score was 97.5 in 2023 and reached the EU target of 100.0 in 2024, both higher than the EU's 79.12 and 82.70. The country is on track to its target according to its national trajectory.

e-ID

Estonian authorities are aligned with the European framework of the eIDAS regulation with a view to offering an EU Digital Wallet.

Estonia has notified six eID items under the Estonian eID scheme: the ID card, the RP card, Digi-ID, e-Residency, Mobiil-ID and Diplomatic ID. In 2023, 89.43% of Estonians used their eID to access online services for private purpose in the previous 12 months, which is significantly above the EU average (41.11%). Estonia is working toward introducing its ID, passport and driving licence into the national mobile application eesti.eeto be able to access government services.

Estonia reports of no new measures in the roadmap.

Estonian stakeholders, both public and private, are present in one of the consortia of LSPs (known as POTENTIAL) that is in the grant agreement preparation stage. The consortium comprises a government ministry and a two private companies. EE overall costs for involvement in proposals is approximately EUR 0.4 million with the grants requested by Estonian entities amounting to approximately EUR 0.2 million. The kinds of case that EE will be involved in include POTENTIAL: Mobile Driving Licence.

Digitalisation of public services for citizens and businesses

In its adjusted roadmap Estonia proposed a new target and trajectory for digitalisation of public services for citizens and businesses, both in line with the EU target of 100%. Given the measures adopted and current rate of progress this target is within reach.

In 2024 Estonia continued its work on integrating digital solutions into all important life events. By the end of 2024 Estonia had 8 life-event services: marriage, childbirth, military service, relocation to Estonia, bereavement, pension, support for a child with a severe diagnosis (new), and divorce (new). Across all life events, there were in total 301 497 visits in total on the eesti.ee site, of which 104 312 visits were related to marriage information (averaging 8 700 times per month). 58% of all marriage applications were submitted through the portal.

The Estonian national mobile application of eesti.ee was launched at the end of 2024, providing access to government services from any location. In its first month it had more than 28 000 downloads.

In 2024, Estonia showed initiative in the area of data consent by providing insight into data usage. Estonia made it obligatory to the adopt the 'Data Tracker' across all governmental administrations by 2025. The Data Tracker provides citizens with a clear overview of the use of their data and in 2024 the service was used over 1 000 000 times to facilitate data-sharing between the state and private sectors. Efforts to establish a legal framework for data consent continued.

Estonia also showed progress in the availability and usability of open data. The number of data sets in the Open Data Portal increased by 905, and as a result reached the 2025 Recovery and Resilience Facility target one year ahead of schedule. Preparations are also underway to launch the Data Information Gateway in the second quarter of 2025.

e-Health

Estonia reached the EU 2030 target of having a score of 100 for access to medical records. The country is on track according to its national trajectory because it has already reached the target.

Estonia reports in their roadmap that older people and people with disabilities may experience difficulty accessing their digital health records.

According to the 2025 Eurobarometer, 81% Estonians think that digital technologies will be important when accessing or receiving healthcare services (e.g., telemedicine, artificial intelligence for diagnosis diseases) during their daily life by 2030.

2024 recommendation on e-Health: Offer a mobile application for citizens to access their electronic health records.
The MS addressed fully the recommendation by putting significant policy actions into place in 2024. Estonia has launched a national mobile app, eesti.ee, that also includes health data. In addition, the browser version of the e-Health portal is accessible to mobile devices.

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

In Estonia online participation in political and civic life is declining. In 2024, 18.28% of people used the internet to participate in consultations, to vote or to share their opinions online. This proportion is below the EU average and is falling (it was 30.44% in 2022), which is the opposite of the trend observed at the EU level (17.59% in 2022 and 20.45% in 2024).

In 2023 in Estonia, 49.67% of individuals came across online messages that were considered hostile or degrading towards groups of people, such as those defined by LGBTIQ identities or religion, placing Estonia well above the EU average of 33.5%. A substantial 65.77% of young people (16-24) reported encountering such messages, compared to 51.47% of adults (25-64), highlighting a significant difference, with the youth experiencing markedly higher exposure. Males (46.99%) had slightly lower rates of exposure compared to females (52.21%). Overall, Estonia experienced one of the highest overall exposure rates in the EU, driven particularly by its youth demographic.

In 2023, 59.91% of individuals in Estonia stated that they had come across untrue or dubious information or content on internet news sites or social media, noticeably higher than the EU average of 49.25%. Of these individuals, according to the survey, 26.13% took steps to verify the content, representing a moderate level of critical engagement in assessing the truthfulness of such material. Young people (aged 16-24) were more likely than adults (25-64) to report encountering such content (69.64% compared with 62.71%). A significant difference existed in verification rates: 46.73% of young people verified the truthfulness of content, compared with 26.45% of adults. Males (61.28%) and females (58.61%) reported similar exposure rates, though males were relatively more likely to verify content, at 30.15% compared to 22.33% for females.

The 2023 data on online interactions in Estonia reveals a concerning picture, with a high proportion of individuals, particularly young people (16-24), coming across hostile and degrading online messages. Additionally, a significant proportion of individuals in Estonia encountered potentially misleading information online. However, the data also suggests that Estonians, especially young people, took steps to address this issue, with a moderate to high level of critical engagement in verifying the accuracy of online content compared to EU averages. The findings highlight the need for continued efforts to promote a safe and informed online environment, with a focus on supporting the population in developing critical thinking and digital literacy skills.

According to the Digital Decade Eurobarometer 2025, 89% Estonians think it should be urgent the action of the public authorities to protect children online regarding the negative impact of social media

on children's mental health, 88% to protect against cyberbullying and online harassment. Additionally, 87% Estonians believe it to be urgent to put in place age assurance mechanisms to restrict age-inappropriate content.

In 2024 the 'France and Estonia – Together Against Disinformation' project was launched. It aims to respond to disinformation campaigns and strengthen democratic resilience by raising public awareness and fostering cross-border collaboration between Estonian and French academia, public institutions, and civil society.

Leveraging digital transformation for a smart greening

Estonia is still aiming to be the greenest digital government in the world with its Digital Agenda 2030, but a systematic approach to the area is yet to be introduced. Despite having this high ambition, Estonia has not yet introduced a strategy to accomplish the feat.

The Estonian population recycles only a small part of its ICT equipment. Estonian people recycled more their laptop and desktop devices (8.60% for laptops and tablets, 10.34% for desktops) than the EU average (11.31% and 14.66%, respectively) but recycled less their mobile phones (8.11%, 10.93% for the EU). Moreover, 22.80% of people considered the energy efficiency as important when purchasing ICT devices (EU: 19.35%) but the eco-design of the device was considered important by 13.29%, which is above the EU average (12.04%). However, those two eco-friendly criteria take on less importance for the buyer than the price, the performance, and the design of the ICT device.

The Estonian population recycles only a small proportion of its ICT equipment. More Estonian people recycled their laptop and desktop devices (8.60% for laptops and tablets, 10.34% for desktops) than the EU average (11.31% and 14.66% respectively) but fewer recycled their mobile phones (8.11% compared with 10.93% for the EU as a whole). Moreover, 22.80% of people considered energy efficiency to be important when purchasing ICT devices (EU: 19.35%) but the eco-design of the device was considered important by 13.29%, which is above the EU average (12.04%). However, these two environmental criteria are of less importance to the buyer than the price, performance and design of the ICT device.

According to the Digital Decade Eurobarometer 2025, 59% Estonians consider digital technologies important to help fight climate change (below the EU average of 74%), and only 56% of Estonian respondents think that ensuring that digital technologies serve the green transition should be an important action for public authorities (below the EU average of 80%).

The private sector is taking initiatives to increase the lifespan of ICT devices. The organisation Green Dice collects old ICT equipment from government and the private sector, refurbishes it and rents it out at an affordable price. More than 2 000 devices have been transferred to schools and to almost 500 individuals.

Estonia is also prioritising the right of future generations and children to a clean environment. A legal act, which entered into force in 2024, emphasises that all individuals and institutions are required to avoid harming the environment in their activities in order not to violate the right of current and unborn children to a full life, health and development.

In 2023 Estonia launched a Sustainability Reporting Tool which aims to be a digital reporting tool that provides guidance on what data to submit to fulfil reporting and produce recommendations on how to improve SMEs performance in the area of sustainability. This project will run until the end of 2025 with a budget of EUR 3.5 million.

The Estonian telecom industry is showing initiative in reducing its energy consumption and carbon footprint. Several of the telecommunication operators have programs to reduce e-waste, by offers mobile phone, and digital equipment recycling programs, as well as encouraging circular economy through refurbished devices.

Estonia

Estonia does not present any measures in its roadmap adjustment dedicated to the green and digital transition.

2024 recommendation on green ICT: Develop a coherent approach to twinning the digital and green transitions. First, promote improvements in energy and material efficiency of digital infrastructures, in particular data centres. Second, 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 of attracting relevant financing.

Estonia made some efforts to address the recommendation through new policy actions in 2024. Estonia demonstrates a high ambition to implement a green digital government, as reflected in its legal acts, private enterprises and ambition. However, there is no concrete framework or policies and measures.

Annex I – National roadmap analysis

Estonia's national Digital Decade strategic roadmap

Estonia submitted a fully revised national Digital Decade roadmap on 27 March 2025. The roadmap contains 13 new targets, 13 trajectories and an update of its intended actions. The adjusted roadmap shows a stronger emphasis on quantum computing (including HPC), EU-level cooperation and digital skills. It includes clear reporting on the public consultation of stakeholders. However, the green transition is not very well incorporated. The roadmap includes measures that provide an insight to the state of play, but most of the activities described lack detail – such as budget, timeline and expected impact – that would give a better understanding of planned actions.

The adjusted roadmap/new roadmap addresses a limited number of roadmap recommendations issued in 2024:

- *Establish a national target and trajectory on VHCN coverage, FTTP coverage, 5G coverage, edge nodes, SMEs with at least a basic level of digital intensity, cloud, AI, data analytics, unicorns, ICT specialists, digital public services for citizens, digital public services for business, and access to health records. Align the level of ambition of the national target and propose a trajectory for at least basic digital skills:* the new roadmap includes a target and trajectory for all these key performance indicators (KPIs) except edge nodes. Estonia has chosen to not set a target in this area because it is following a market-driven approach. Estonia has aligned the level of ambition of the target for digital skills of at least a basic level with the EU target (80%) and has proposed a trajectory for this target.
- *Clearly present measures dedicated to VHCN coverage, FTTP coverage, 5G coverage, edge nodes, SMEs with at least a basic level of digital intensity, cloud, AI, data analytics, unicorns, ICT specialists, at least basic digital skills, digital public services for citizens, digital public services for business, and access to health records considering the Digital decade objectives. When presenting the measures in the roadmap provide a description of the measures, describe its intended effects and results, state the budget of the measure differentiating from public, EU and private funding:* Estonia has presented its planned activities dedicated to the KPIs mentioned above. However, these activities have not been presented as clear-cut measures with budget, timeline and expected impact giving a better understanding of planned actions.
- *Consult stakeholders in the drafting of the roadmap. Report on the consideration of stakeholders' feedback in the roadmap:* Estonia has consulted and reported on the stakeholders' feedback process. Estonia initiated a review involving contributors from the public and private sectors and civil society. Additionally, Estonia also conducted surveys, participated in networking forums and held workshops. The roadmap lacks information on how stakeholder feedback was taken into consideration.

Overall, Estonia presents a selected set of main policies and measures contributing to the achievement of some Digital Decade targets. The measures presented cover several types of objectives: technological leadership, sovereignty, competitiveness and cybersecurity. It is not possible to determine the budget of the measures presented.

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

Multi-country projects and best practices

Estonia is a member of the Local Digital Twins towards the CitiVERSE EDIC, is an observer to the Alliance for Language Technologies EDIC and is also working towards setting up an EDIC in the area of genomics. Estonia is a participating state of the EuroHPC Joint Undertaking (JU) and of the Chips JU.

Estonia has not yet presented any project in the framework of Digital Decade's Best Practice Accelerator[6].

EU funding for digital policies in Estonia

Estonia allocates 24% of its total recovery and resilience plan to digital (EUR 208 million)[7]. In addition, under cohesion policy, EUR 373 million (representing 11% of the country's total cohesion policy funding), is dedicated to advancing Estonia's digital transformation[8]. According to JRC estimates, EUR 541 million directly contribute to achieving Digital Decade targets (of which EUR 208 million comes from the RRF and EUR 333 million from cohesion policy funding)[9].

The RRF and Cohesion Funding provide balanced support across the different Digital Decade targets. In particular, the Estonian Recovery and Resilience Plan (RRP) is making significant contributions to the targets related to the digitalisation of public services. The plan also includes important reforms and investments aimed at increasing gigabit network coverage.

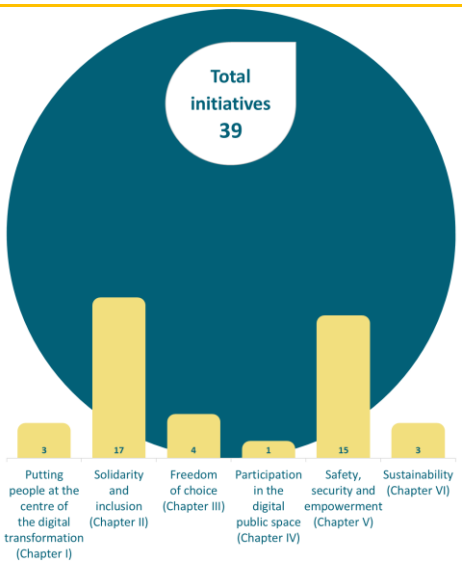
[6] The Best Practice Accelerator (BPA) is a platform that enables Member States to share successful measures and challenges encountered in their efforts to meet their Digital Decade targets and objectives. Best practices are made available to Member States via the BPA Repository and showcased in regular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

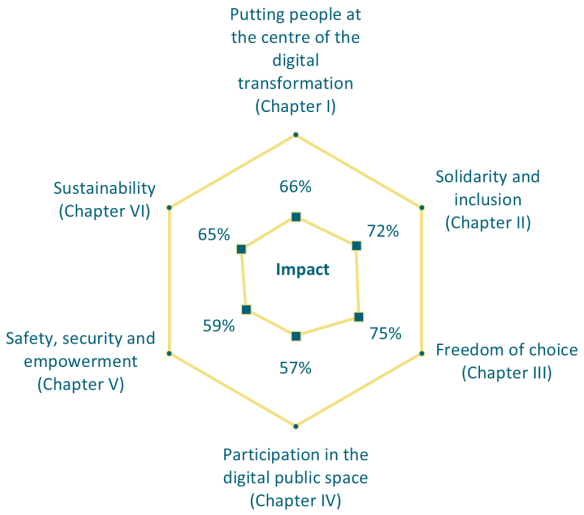
[7] The share of financial allocations that contribute to digital objectives has been calculated using Annex VII to the Recovery and Resilience Facility Regulation. Last data update: 16 May 2025.

[8] 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.

[9] 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[10]





Activity on Digital Rights and Principles (figure 1)

Estonia has shown rather limited activity in implementing digital rights and principles, with the overall number of initiatives of around a half or less of the EU average (77). Estonia launched 6 new initiatives in 2024, showing notable progress towards its commitments. **Estonia is most active in the area of A protected, safe and secure digital environment** (V). There is room for improvement, especially with regards to A fair digital environment (III) where less activity has been identified.

Impact of Digital Rights Initiatives (figure 2)

Quantitative impact indicators, developed by the 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 Estonia (mainly national government) and how these are perceived by citizens.

The indicators suggest that **Estonia is most successful in implementing commitments related to Freedom of choice** (III). Estonia should strengthen efforts in areas where the impact of digital rights initiatives appears to be limited, notably on Participation in the digital public space (IV).

According to the Special Eurobarometer 'Digital Decade 2025', **45% of citizens in Estonia think that the EU protects their digital rights well** (a 3% increase since 2024). This is slightly above the EU average of 44%. Citizens are particularly confident about getting easy online access to all key public services in the EU (68%, above the EU average of 58%). They are most worried that their right to a safe digital environment and content for children and young people is not well protected (49%, above the EU average of 48%).

[10] 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.