



Digital Economy and Society Index (DESI) 2021

Slovenia

About the DESI

The European Commission has monitored Member States' progress on digital and published annual Digital Economy and Society Index (DESI) reports since 2014. Each year, the reports include country profiles, which help Member States identify areas for priority action, and thematic chapters providing an EU-level analysis in the key digital policy areas.

In 2021, the Commission adjusted DESI to reflect the two major policy initiatives that will have an impact on digital transformation in the EU over the coming years: the Recovery and Resilience Facility and the Digital Decade Compass.

To align DESI with the four cardinal points and the targets under the Digital Compass, to improve the methodology and take account of the latest technological and policy developments, the Commission made several changes to the 2021 edition of the DESI. The indicators are now structured around the four main areas in the Digital Compass, replacing the previous five-dimension structure. 11 of the DESI 2021 indicators measure targets set in the Digital Compass. In future, the DESI will be aligned even more closely with the Digital Compass to ensure that all targets are discussed in the reports.

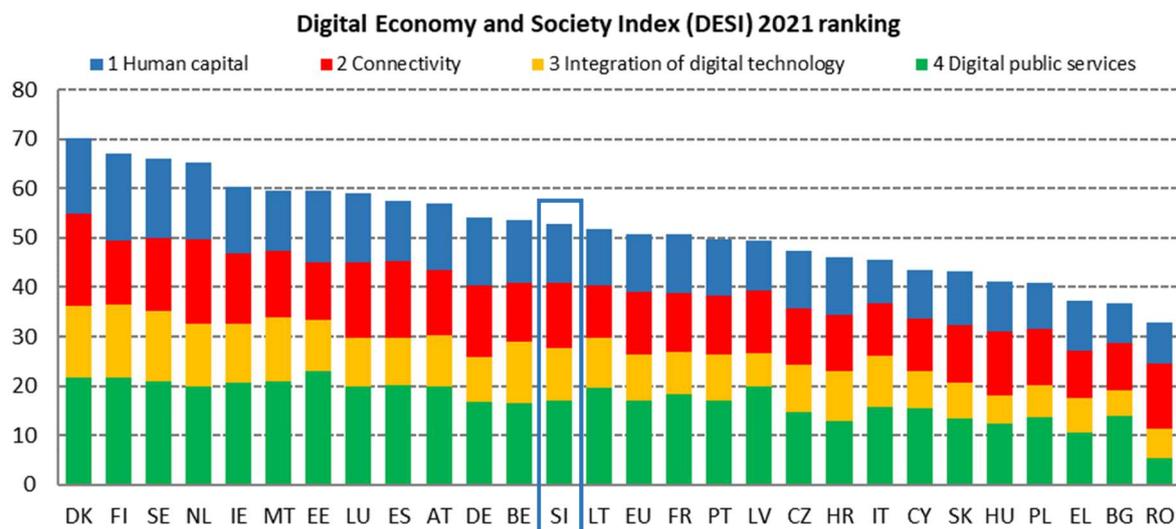
In addition, DESI now includes an indicator measuring the level of support that adopted ICT technologies provided companies in taking more environmentally friendly measures (ICT for environmental sustainability) and the take up of gigabit services, plus the percentage of companies offering ICT training and using e-invoicing.

The DESI scores and rankings of previous years were re-calculated for all countries to reflect the changes in the choice of indicators and corrections made to the underlying data.

For further information, see the DESI website: <https://digital-strategy.ec.europa.eu/en/policies/desi>.

Overview

	Slovenia		EU
	rank	score	score
DESI 2021	13	52.8	50.7

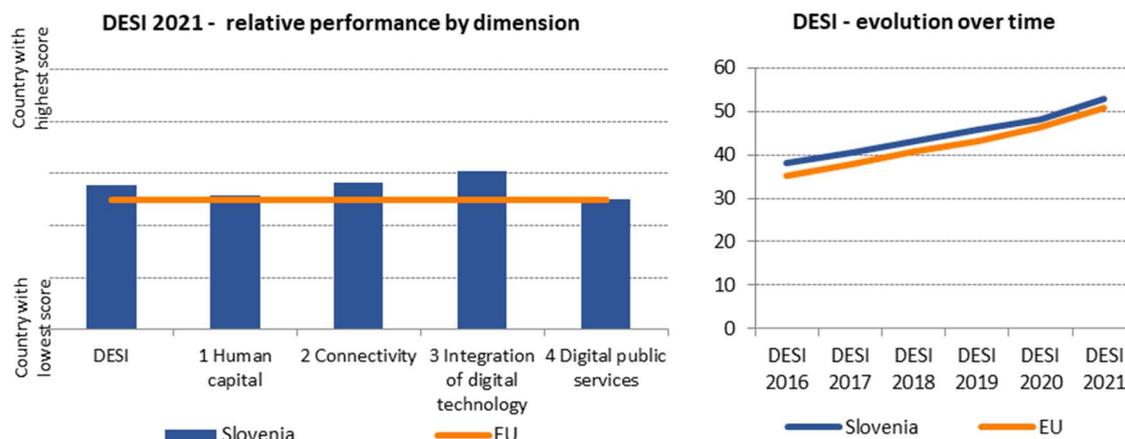


Slovenia ranks 13th among the EU Member States in the 2021 Digital Economy and Society Index (DESI). It is 9th in the EU in Connectivity. The number of households covered by fixed very high-capacity networks has increased slightly and is above the EU average. The country performs well in the take-up of at least 100 Mbps broadband. Next generation access broadband covers 88% of households, close to the EU average, but this percentage is significantly lower in rural areas. Slovenia's 5G deployment has not yet begun, but 98% of 5G spectrum has been assigned.

On Human capital – one of Slovenia's biggest strengths – the country remains just below the EU average. The government is revising its digital education strategy, addressing digital skills as part of its 2027 digital education action plan to stimulate the uptake of digital technology by businesses.

Slovenia ranks 8th among EU countries on integration of digital technology in businesses. High-performance computing (HPC) is a national investment priority. Slovenia now has 'HPC Vega', its first petascale EuroHPC supercomputer. In March 2021, Slovenia adopted the national cyber incident response plan, unifying cyber incident management procedures and providing stakeholder guidelines for a coordinated response.

In digital public services, the country performs well in the open data indicator, advancing to 10th position in the EU. Slovenian internet users actively engage with e-government services (77%) compared to the EU average of 64%. The country's 2030 digital public services strategy will set out the forthcoming goals and actions in this field.



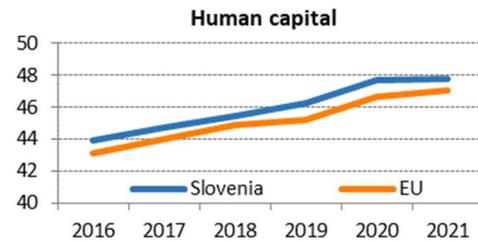
Digital in Slovenia's recovery and resilience plan (RRP)

Slovenia's RRP has a total budget of about EUR 2.5 billion (5.4% of GDP) comprising EUR 1.78 billion in non-repayable financial support and EUR 705 million in loans allocated to four 'clusters': 'Green transition'; 'Digital transformation'; 'Smart, sustainable and inclusive growth'; and 'Health and welfare', including social housing. The plan's measures encompass all seven European flagships. Slovenia has earmarked 21% of the RRP for measures supporting the digital transition. The components with the largest contribution are those for the digital transformation of public services and the public administration (EUR 260 million), healthcare (EUR 83 million), competence development and modernising the education system (EUR 60 million) and the digitalisation of businesses (EUR 49 million). National strategies are under way with reforms and investments included in the RRP to address digital skills, digitalisation of businesses and improvement of e-government services. The strategy for the digital transformation and electronic identification is expected to strengthen public e-services and the digitalisation of companies, boosting cybersecurity across sectors. Investments in connectivity and digital skills are expected to reduce the digital divide.

Slovenia is planning four multi-country projects on advanced technologies: i) Next Generation Cloud Infrastructure and Services, ii) Low-Power Processors and Semiconductor Chips, iii) European Blockchain Service Infrastructure and iv) European Quantum Communications Infrastructure. The country aims to build a new generation of energy-saving infrastructure and services from edge to cloud, implementing industrial and service applications, and strengthening the cybersecurity of cloud infrastructure and services. Slovenia's goals are to (i) improve planning capabilities and the autonomy and resilience of semiconductor value chains, (ii) extend European blockchain service infrastructure by integrating it with national infrastructure and (iii) establish a national quantum communication infrastructure network connected to those of neighbouring countries.

1 Human capital

1 Human capital	Slovenia		EU
	rank	score	score
DESI 2021	13	47.8	47.1



	Slovenia			EU
	DESI 2019	DESI 2020	DESI 2021	DESI 2021
1a1 At least basic digital skills % individuals	54%	55%	55%	56%
1a2 Above basic digital skills % individuals	30%	31%	31%	31%
1a3 At least basic software skills % individuals	57%	59%	59%	58%
1b1 ICT specialists % individuals in employment aged 15-74	4.0%	3.9%	4.4%	4.3%
1b2 Female ICT specialists % ICT specialists	17%	20%	17%	19%
1b3 Enterprises providing ICT training % enterprises	29%	28%	26%	20%
1b4 ICT graduates % graduates	3.7%	3.5%	4.1%	3.9%

On Human capital, Slovenia ranks 13th among EU Member States. Slovenia's human capital is one of its strengths, with a high number of STEM graduates and ICT start-ups above the EU average. In all indicators in this dimension, Slovenia is close to the EU average. 55% of people aged 16 - 74 years have at least basic digital skills. The proportion of ICT specialists stands at 4.4% of the workforce, up from 3.9% a year ago and women make up 17% of all ICT professionals. ICT graduates in Slovenia account for 3.5% of the total.

The *Digitalna Slovenija 2020*¹ strategy 2016-2020 helped improve connectivity and wi-fi access in schools, digital literacy and inclusion, also that of older people. Guidelines for active employment measures for 2021-2025 were adopted in early 2021, focusing on digital skills, literacy, and lifelong learning, especially for vulnerable groups. Slovenia is revising its digital education strategy to address digital skills in its 2027 digital education action plan finalised by the Ministry of Education, Science and Sport². Its vision is a robust education and training system which prepares people for a quality life in a digital and green society, comparable to the most advanced countries. It will establish a national centre and hubs for digital education, a comprehensive structure coordinating all aspects of digital education: organisational, content-related and financial.

In response to the COVID-19 crisis, Slovenia took steps to equip schools, teachers and students with digital devices, educational applications and content to allow for continuity during the school closures. Through the European Regional Development Fund project 'SIO 2020' and other funds, the Slovene

¹ See Digitalizacija družbe: <https://www.gov.si/teme/digitalizacija-druzbe/#:~:text=Strategija%20Digitalna%20Slovenija%202020%20je%20ena%20izmed%20treh,na%20prednostnih%20podroc%20C4%8Djih%20povezuje%20strategija%20pametne%20specializacije%20%28S4%29.>

² Key areas: digital education hubs, pedagogy, updating curricula, study programmes and job profiles, education and training of educators, management and other experts; inclusive digital support environment; education in special circumstances.

government purchased ICT equipment for schools and server infrastructure for applications and e-services. It prioritised e-services, educational applications and the raising of teachers' and parents' digital competences. Slovenia is stepping up the development of emerging technologies that improve teaching and learning to reduce the share of underperforming students in computer and information literacy. The government is developing the 2030 'Digital Slovenia' strategy, outlining its digitalisation goals around five priorities, one being digital inclusion.

Numerous programmes support digital development. The Chamber of Commerce's Digital Academy has been running since 2017. The Ministry of Economic Development and Technology funds vouchers for digital competences, marketing, strategy and cybersecurity for small and medium-sized enterprises (SMEs). In 2020, SMEs received over 2000 vouchers to help them improve their digital performance. The Digital Innovation Hub Slovenia is preparing consultancy services for digital education programmes in companies and digital roadmaps matching their digital maturity. The project collaborates with the Slovenian Chamber of Commerce and Industry and the Ministry of Economic Development and Technology. A public tender in April 2021 aims to strengthen companies' digital competencies supporting 2 500 older (50+ years) employees by June 2022.

Slovenia's human capital is characterised by a relatively high number of ICT start-ups above the EU average and a high proportion of STEM graduates. Slovenia would benefit from encouraging more people, particularly women, to train and reskill to become ICT specialists, with software developers most in demand according to the Digital Innovation Hub Slovenia.

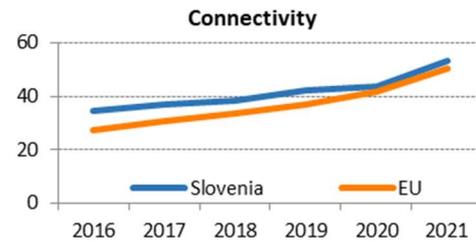
Slovenia witnessed a significant take-up of teleworking, remote schooling, online commerce (click and collect) and online banking over the past year. The COVID-19 crisis provided the push for change, stimulating support programmes and measures that are expected to positively affect the digital divide, and address weaknesses highlighted in the past.

Human capital in Slovenia's recovery and resilience plan (RRP)

Investments in digital skills is a key focus of the digitalisation measures in the Slovenian plan, which dedicates EUR 66.72 million to the digitalisation of education, science and sport. Measures include reforms and investments to increase the digital skill levels of public employees as well as of the population at large. This includes the setting up of a competence centre for upskilling civil servants and strengthening their digital skills, the development of IT solutions for education, trainings of teachers, modernising curricula for digital skills development, and digitally equipping learning places. A significant part of the education investments in the RRP also focuses on increasing digital skills and the number of education professionals and managers who have completed training in digital and sustainable development. Parts of the investment under the 'digitalisation of the public administration' component also contain measures to develop digital skills in the public administration sphere.

2 Connectivity

2 Connectivity	Slovenia		EU
	rank	score	score
DESI 2021	9	53.2	50.2



	Slovenia			EU
	DESI 2019	DESI 2020	DESI 2021	DESI 2021
2a1 Overall fixed broadband take-up % households	85%	83%	80%	77%
2a2 At least 100 Mbps fixed broadband take-up % households	16%	21%	29%	34%
2a3 At least 1 Gbps take-up % households	NA	<0.01%	0.02%	1.3%
2b1 Fast broadband (NGA) coverage % households	86%	87%	88%	87%
2b2 Fixed Very High Capacity Network (VHCN) coverage % households	61%	64%	66%	59%
2c1 4G coverage % populated areas	99.5%	99.7%	>99.9%	99.7%
2c2 5G readiness Assigned spectrum as a % of total harmonised 5G spectrum	0%	0%	98%	51%
2c3 5G coverage % populated areas	NA	NA	0%	14%
2c4 Mobile broadband take-up % individuals	64%	73%	73%	71%
2d1 Broadband price index Score (0-100)	NA	63	72	69

With an overall score of 53.2, Slovenia ranks 9th in the EU for connectivity. It has very good fixed Very High-Capacity Network (VHCN) coverage (66% – rising from 61% in 2018 – against an EU average of 59%). The VHCN networks (65.6%) are all fibre to the premises, while cable networks, which currently cover 58.7% of households, have not yet been updated to DOCSIS 3.1. On the other hand, the take-up of at least 100 Mbps broadband steadily increased (from 21% of households in 2019 to 29% in 2020), but overall, Slovenia scores lower than the EU-27 average for this indicator (34% of households in 2020). Concerning next generation access (NGA) broadband coverage, 88% of total Slovenian households are covered, which is close to the 2019 figure and one percentage point higher than the EU average. However, regarding the percentage of households covered in rural areas, the figure drops to 63%. 5G deployment stood at 0%, but 98% of 5G spectrum has been assigned. The broadband price index observed an increase in 2020, rising from 63 to 72 (on an index score from 1 to 100). This figure is slightly higher than the EU average of 69.

Although the Slovenian 2020 national broadband strategy (next-generation broadband network development plan – NGN), set up in 2016 and updated in 2018, is in line with the gigabit society targets, the EU 2020 goals for gigabit coverage have not yet been achieved. This was mainly due to the delay of the publicly funded project for the construction of the 2020 NGN, with a budget of approximately EUR 29.5 million (of which EUR 23.5 million came from the European Regional

Development Fund). The two calls for tender in 2018 were unsuccessful due to lack of applicants. According to the Slovenian authorities, the causes included insufficient public funds for co-financing and a relatively low population density. Later in 2020, a new tender was launched with an improved co-financing model, with 27% of the existing white spots (areas without network coverage) covered under this call. In March 2021, a new tender was published with a further improved co-financing model.

The new national broadband plan for Slovenia, which was originally scheduled for 2020, but then postponed due to the COVID-19 outbreak, is now under preparation and will be part of the 2030 'Digital Slovenia' strategy, still to be adopted in 2021. The new plan is expected to include measures in line with the EU gigabit objectives for 2025, including (i) 5G coverage for urban areas and main terrestrial transport routes, (ii) gigabit connectivity for schools, transport hubs, public services providers and digitally intensive enterprises, and (iii) at least 100 Mbps upgradable to 1 Gbps coverage for the public.

According to data collected by the Ministry of Public Administration, the interest expressed by operators in 2016-2017 and in 2019 shows that they intend to build infrastructure for around 130,000 fixed Next Generation Access (NGA) networks in the coming years using private funds, where such connections do not yet exist today. This would leave approximately 55,000 households uncovered.

A multiband auction for spectrum assignment took place in April 2021. After several bidding rounds, the frequencies were assigned to A1 Slovenije, T-2, Telekom Slovenije and Telemach. Except for frequencies in the 2100 MHz band, which became available in September 2021 and frequencies in the 2300 MHz band, which become available in 1 January 2022, all other bands were already available.

The Slovenian government is planning to propose projects to finance digital infrastructure in the next funding period (2021-2027) of the Connecting Europe Facilities 2 (CEF 2) programme, with a focus on continuing the construction of broadband infrastructure. The priorities are mainly in 5G technology, i.e. the 5G corridors Ljubljana-Koper and Ljubljana-Trieste. The project proposals are planned to involve both public and private organisations. The Slovene authorities intend to have the projects involving the construction of co-financing broadband infrastructure in white spots co-financed within the RRF and in the next funding period within the European Regional Development Fund.

Main market & regulatory developments

In 2020, the Slovenian market experienced an increase in the take-up of quadruple-play and triple-play bundles. A slow migration of users from stand-alone broadband access and double play to other bundles was also observed in 2020. Telemach has the highest market share of bundles (33.0 %), followed by Telekom Slovenije (29.1 %) and T-2 (19.5 %).

In terms of usage patterns of over-the-top media services (OTTs), communication between people migrated from SMSs to calls and use of social media such as Zoom, Webex, Viber, WhatsApp, and Skype. This phenomenon occurred due to COVID-19 pandemic measures. At the same time, until March 2020, roaming calls (made and received) and SMSs maintained their seasonal pattern, which showed a growth trend. The pandemic and the measures taken have affected roaming calls (made and received) and SMSs, with revenues significantly decreasing from April 2020 onwards.

Although Telekom Slovenije remained the leader in terms of market share of fixed broadband connections (30.3%) in 2020, Telemach has been advancing rapidly. Concerning VoIP, mergers of

small but important operators have greatly increased the market share of Telemach (32%), which is gaining gradually on Telekom Slovenije's market share (34%).

The public consultation on the draft of the new electronic communications act was (the ZEKom-2) completed by the end of October 2020. Slovenia is one of the 23 EU Member States that received, on 4 February 2021, a letter of formal notice that started the infringement procedure for failing to transpose into national law Directive (EU)2018/1972, establishing the European Electronic Communications Code, by the deadline of 21 December 2020. According to the procedure, inter-ministerial coordination must be carried out before the government confirms the wording of the ZEKom-2. It must then be sent to the National Assembly for adoption. The government had been expected to finish the first part of the procedure by July 2021, while the National Assembly is expected to adopt the ZEKom-2 by November 2021. Then the act is expected to be published in the Official Gazette of the Republic of Slovenia in either November 2021 or, at the latest, the beginning of December 2021.

Slovenia presented a National Roadmap for implementing the EU 5G Connectivity Toolbox. It includes measures on simplifying the procedure for operators when applying for permits, the applications for which can be submitted electronically. The ZEKom-2 is expected to (i) retain the limit on fees for rights of way from the existing Law on Electronic Communication (ZEKom-1) and extend it further to all networks, and (ii) retain (from ZEKom-1) free of charge access to real estate owned by the state or a self-governing local community, when using public funds for construction.

In October 2020, the government presented a draft proposal to merge eight regulators, including the Slovenian National Regulatory Authority for Telecommunications, AKOS, into two super-agencies. The proposal did not get enough support in Parliament during the first reading in April 2021, and the bill was therefore rejected.

In 2020, the overall number of complaints fell from 2019 (568 against 720). Also, in 2020, most disputes were connected to billing and poorly operated services (unjustified invoices and unavailability of service). This drop in complaints could be linked to AKOS' launching of a service advising end users about their rights, where to find solutions, and when/how to file a formal dispute.

By completing the spectrum multiband auction, Slovenia has taken a significant step in implementing its strategy for managing the radiofrequency spectrum needed for promptly assigning the 5G pioneer spectrum bands and for deploying 5G. However, it will be important to ensure that (i) the European Electronic Communications Code is promptly transposed into national law, (ii) the recommendation included in the EU Connectivity Toolbox to make the 5G deployment sustainable for the operators is systematically implemented, and (iii) the measures are in line with the 2025 gigabit society targets.

Highlight 2020-2021: multiband auction

The multiband auction took place in April 2021. The frequencies were acquired by the following bidders: A1 Slovenije, T-2, Telekom Slovenije and Telemach. The following radio frequency bands are still available after the licences were issued in mid-2021 – 700 MHz FDD, 700 MHz SDL, 1500 MHz SDL, 3600 MHz and 26 GHz. Frequencies in the 2100 MHz band are available since 22 September 2021 and those in the 2300 MHz band as of 1 January 2022. Before the additional frequency bands were awarded in 2021, Telekom Slovenije established a fifth-generation national network in July 2020 upgrading 150 base stations.

Connectivity in Slovenia's recovery and resilience plan (RRP)

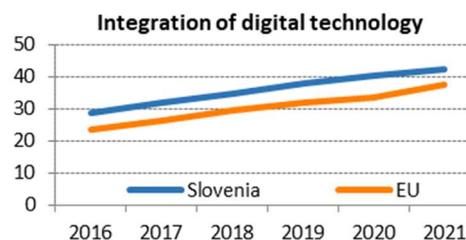
The digital administration component is expected to further address the transition to a gigabit society by improving the regulatory environment and strengthening digital connectivity through investment in broadband infrastructure in hard-to-reach areas.

Investments in connectivity (EUR 30 million) are envisaged to bridge the digital divide. The plan includes the development of the Connectivity toolbox roadmap to foster 5G and broadband roll-out with the introduction of best practices. The strategy for the digital transformation of enterprises will also include a roadmap for implementing the Common Union Toolbox for Connectivity³, which will focus on activities related to a single information point. The reform included in the roadmap will be completed by 30 June 2022.

³ According to Commission Recommendation (EU) 2020/1307 on a common Union toolbox for reducing the cost of deploying very high capacity networks and ensuring timely and investment-friendly access to 5G radio spectrum, to foster connectivity in support of economic recovery from the COVID-19 crisis in the Union.

3 Integration of digital technology

3 Integration of digital technology	Slovenia		EU
	rank	score	score
DESI 2021	8	42.3	37.6



	Slovenia			EU
	DESI 2019	DESI 2020	DESI 2021	DESI 2021
3a1 SMEs with at least a basic level of digital intensity % SMEs	NA	NA	68% 2020	60% 2020
3b1 Electronic information sharing % enterprises	30% 2017	33% 2019	33% 2019	36% 2019
3b2 Social media % enterprises	18% 2017	24% 2019	24% 2019	23% 2019
3b3 Big data % enterprises	10% 2018	10% 2018	7% 2020	14% 2020
3b4 Cloud % enterprises	17% 2018	17% 2018	26% 2020	26% 2020
3b5 AI % enterprises	NA	NA	33% 2020	25% 2020
3b6 ICT for environmental sustainability % enterprises having medium/high intensity of green action through ICT	NA	NA	74% 2021	66% 2021
3b7 e-Invoices % enterprises	62% 2018	62% 2018	58% 2020	32% 2020
3c1 SMEs selling online % SMEs	17% 2018	17% 2019	17% 2020	17% 2020
3c2 e-Commerce turnover % SME turnover	NA	11% 2019	12% 2020	12% 2020
3c3 Selling online cross-border % SMEs	12% 2017	12% 2019	12% 2019	8% 2019

Slovenia ranks 8th among EU countries on integration of digital technology in businesses. In all the indicators apart from businesses using electronic information sharing, where it is 3 percentage points below the EU average, Slovenia's scores are equal to or higher than the EU average. The country performs in line with the EU average for cloud services, SMEs selling online and e-commerce turnover, but falls short on the use of big data analysis at 7% against the EU average of 14%. SMEs with at least a basic level of digital intensity are at 68% compared to 60% at EU level. 33% of companies use AI, compared to 25% at EU level, and 58% of them use e-invoices (nearly twice the EU average).

The country continues to implement the *Digitalna Slovenija 2020* strategy, the research and innovation strategy, and the smart specialisation strategy. Actions stemming from those strategies are the strategic research and innovation partnerships (SRIPs), digital innovation hubs and FabLabs (digital fabrication laboratories, providing access to skills, materials and technology to create, mentor and invent). SRIPs are long-term partnerships between the business community, research organisations, the state, innovation users and NGOs. Stakeholders coordinate R&D activities, share capacities, knowledge and experience. There are nine SRIPs involving key digital technologies, including the SRIP Smart Cities and Communities/ICT Horizontal Network and the SRIP Factories of the future (robotics, photonics, process technologies, and plasma).

Slovenia's programme for SMEs' digital transformation 2018-2023 includes: (i) activities of the digital innovation hub; (ii) the Slovene Entrepreneurial Fund's voucher schemes for digitisation worth EUR 1 000 - EUR 9 999 per project for investments related to digital strategy, marketing, competencies and cybersecurity; (iii) SMEs' digitalisation, for which SPIRIT Slovenia (the business development agency) launched a call. Slovenia has successfully finished the national designation process, proposing three candidates for the Network of European Digital Innovation Hubs⁴. Slovenia plans to use financing from the European Regional and Development Fund to strengthen its network of hubs.

Slovenia has signed the EU declaration on cloud computing. High-performance computing (HPC) is a national priority according to the 2011-2020 research and innovation strategy, the 2014-2020 research infrastructure development plan and the smart specialisation strategy S4⁵. HPC Vega, operating since 2020, is the country's first petascale Euro HPC supercomputer and the first EU supercomputer jointly financed with EU funds. It will support European researchers and users from the public and industrial sectors, driving innovation and competitiveness in AI, high-performance data analytics, personal medicine, bioengineering, climate change, and drug and material design.

Slovenia has made a successful bid under a CEF call for a hub setting up blockchain infrastructure to allow reliable cross-border services. It launched the national test blockchain infrastructure 'SI-Chain', which will enable existing and new blockchain applications for the public and private sectors to be tested. Creating a supportive environment may boost the innovation potential of SMEs and start-ups. The European blockchain services infrastructure would be part of the 2022 strategy for eight nodes at national level, funded with EUR 6.5 m. Slovenia has signed the EU Declaration on AI⁶, and is adopting the national programme for artificial intelligence. In June 2020, Slovenia co-launched the Global Partnership on Artificial Intelligence (GPAI) initiative, which promotes responsible AI use and development, and encourages investments that consider human rights and diversity⁷.

In March 2021, Slovenia adopted the national cyber incident response plan (NCIRP), unifying the management of cyber incidents and providing guidelines for a coordinated response to all stakeholders. It offers a uniform taxonomy for classifying hazards and effects of cyber incidents, a methodology for reporting incidents, and a response at national level. The NCIRP also sets out the composition and tasks of the CyberSecurity Coordination Group as per the Information Security Act. Slovenia intends to continue its efforts to (i) digitalise businesses, with a specific focus on SMEs, (ii) tap into the potential of digital technologies for higher productivity and innovation capacity and (iii) further improve the competitiveness of its economy.

Integration of advanced technology in Slovenia's recovery and resilience plan (RRP)

The digital transformation strategy for enterprises included in the RRP is expected to be finalised by the end of 2021. It envisages RRF investments for EUR 49 million. It will ensure that all business operators are registered in one register in accordance with the "once-only" principle embedded in the Single Digital Gateway Regulation EU 2018/1724. It will include a roadmap for the implementation of the Common Union Toolbox for Connectivity, activities relating to a single

⁴ [Zaključen izbor prijaviteljev v Republiki Sloveniji za kandidaturo za Evropska digitalna inovacijska stičišča \(EDIH\) | GOV.SI](#)

⁵ Slovenia is currently preparing its new 2021-2030 research and innovation strategy, in which open science is a priority area.

⁶ See [EU Declaration on Cooperation on Artificial Intelligence | JRC Science Hub Communities \(europa.eu\)](#)

⁷ According to the Ministry of Education, Science and Sport, this international initiative will aim to close the gap between theory and practice by supporting state-of-the-art research, pilot projects and top-priority AI efforts. The initiative will bring together experts from various fields in cooperation with international organisations and partners. The task forces will focus on four subjects: responsible AI, data management, the future of work, and innovations and commercialisation.

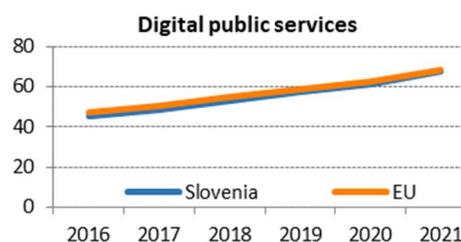
information point and a timeline for the completion of each action. Flanking those measures are reforms on electronic identification that will increase the use of public e-services and the digitalisation of companies, as boost cybersecurity across sectors.

Slovenia's RRP includes reforms and investments related to the digitalisation of businesses. The reforms are expected to accelerate the implementation of the following two investments: establishing a hybrid cloud and the industrial/business digital transformation programme for 20 consortia of large, medium and small businesses. The purpose is to boost the competitiveness of SMEs and large companies.

The digital cluster comprises four multi-country projects on cloud and edge computing, microelectronics, quantum communication and blockchain. In terms of advanced technologies for businesses, the plan includes €7.5 million in support to the IPCEIs in cloud, edge computing and microelectronics.

4 Digital public services

4 Digital public services	Slovenia		EU
	rank	score	score
DESI 2021	15	68.0	68.1



	Slovenia			EU
	DESI 2019	DESI 2020	DESI 2021	DESI 2021
4a1 e-Government users % internet users	67% 2018	63% 2019	77% 2020	64% 2020
4a2 Pre-filled forms Score (0 to 100)	NA	NA	67 2020	63 2020
4a3 Digital public services for citizens Score (0 to 100)	NA	NA	74 2020	75 2020
4a4 Digital public services for businesses Score (0 to 100)	NA	NA	78 2020	84 2020
4a5 Open data % maximum score	NA	NA	84% 2020	78% 2020

Slovenia ranks 15th among EU countries in digital public services. 77% of Slovenian internet users engage with e-government services compared to the 64% EU average. Slovenia's digital public services score for businesses is 78 compared to 84 for the EU. The country performs well in the open data indicator, ranking 10th.

According to the latest eGovernment Benchmark Report⁸, Slovenia is experiencing a medium-low level of penetration, with an average level of digitalisation in public services. Therefore, it is part of the 'expandable eGov scenario', in which the innovation process has been carried out efficiently, but it is desirable to expand the number of users to fulfil its potential. A common national electronic identifier is missing, but an e-ID action is planned for 2021 (including the development of e-identity for businesses or the creation of a single register, together with an innovative solution to create e-identity for businesses – 'digital cards'). This action is planned as access to several open databases and services is not secure or user-friendly. Efforts are needed to accelerate the introduction of secure, unique and user-friendly solutions such as e-identifiers or e-signatures, which will boost the uptake of digital public services, increase trust in online transactions and ensure mobile and cross-border access to public services. It is also necessary to increase interoperability across public IT systems (for the tax authority, land registry, company register, etc.) which are mostly designed as closed systems, operating with different access codes to those for the general digital public services platform e-VEM. Investments in common standardised architecture and digital infrastructure with converging 4IR technologies (Internet of things, big data, AI/machine learning, blockchain, and cybersecurity) will support the reform of local public services making digital services more accessible to users and decreasing the risk of social exclusion.

⁸ <https://digital-strategy.ec.europa.eu/en/library/egovernment-benchmark-2020-egovernment-works-people>

The COVID-19 crisis affected key societal indicators related to public use of internet services. Public administration interacted online with the public and businesses, as some identification requirements were lifted or loosened to make digital public services more user-friendly.

The 2030 digital public services strategy will set out the goals and actions in the field through a secure and smart public service ecosystem that will increase its efficiency through advanced technologies and tools. Slovenia is preparing new legislation to introduce a national e-identity card in 2021 and has rolled out the 'SMS PASS' for mobile-based access. It intends to introduce new app-based mobile solutions for authentication and e-signature to offer more secure mobile access. Slovenian citizens and companies have unique ID numbers widely used in paper-based and online procedures, but which are unsuitable for electronic identification. At present, most e-services rely on qualified digital certificates issued by the public or private sector used for authentication and e-signature. Their caveat is that they are relatively complex for the user and can depend heavily on browser policies.

The authentication and e-signature service 'SI-PASS', which offers a central service for authentication and e-signature, is integrated into the portals of over 100 municipalities. This service along with the Slovenian eIDAS node can enable cross-border authentication according to the eIDAS regulation. Projects to implement the CEF building blocks are being prepared and in this instance, Slovenia intends to use EU structural funds. The planned roll-out of the national e-identity card in 2021 and the recent app-based mobile solutions for authentication and e-signature implemented in 2020 are expected to result in secure, unique, user-friendly electronic identifiers. This should boost the take-up of digital public services and online transactions in the business sector. The governance framework will be included in the forthcoming 2022-2027 strategy for digitalisation of healthcare – an outcome of the structural reform support programme.

The lower than expected up-take of digital public services could be linked to a low degree of trust, security concerns and low interoperability, although Slovenia saw considerable take-up of e-government services by businesses and households. The roll-out of e-identity through a certificate or through SMS Pass should boost the use of digital public services and trust in online transactions. It should ensure mobile and cross-border access to public services. The adoption of a national digital public services strategy will lay the foundation for a forward-looking policy framework flanked by a new institutional organisation: the IT Development Council, responsible for steering and coordinating digital solutions in the public sector.

Digital public services in Slovenia's recovery and resilience plan (RRP)

Slovenia's RRP brings a comprehensive approach to digitalisation of the public administration, backing it with an allocation of almost EUR 309 million (12.5% of the budget). A balanced package of reforms and investments in ICT infrastructure aims to strengthen e-government, the data economy and R&D for AI.

The plan introduces a national electronic identifier to speed up the development of e-services nationally and cross-border, opening access to interoperable e-services. Slovenia is expected to adopt the 2021-2030 digital public services strategy and re-establish the Informatics Development Council as the coordinator for all ICT investments. The national cybersecurity strategy will strengthen capacity and diminish risks. Investment in research, development and innovation as regards the digital transition should ensure state-of-the art digital solutions. The one-stop shop for businesses in their dealings with the public administration will be expanded for the public, aiming to reduce the administrative burden for businesses by providing them with a single digital identity, facilitating market access, increasing security and reducing operational risks. Key measures in these components include a strategy for digital transformation of the public sector including eIDs for the public and companies.

The RRP promotes the digitalisation of the following areas: (i) the public administration for internal security (upgrade the technology available to the police via state-wide TETRA digital radio network infrastructure, involving 11 000 users); (ii) education; (iii) science and sport; (iv) space and environment; (v) agriculture, food and forestry; (vi) culture (EUR 10 million for building an e-culture platform); (vii) spatial planning; (viii) real estate; (ix) nature; (x) water; and (xi) justice (upgrading equipment for courts, and providing a virtual assistant at the Supreme State Prosecutor's Office, making the justice system more accessible and shortening the time needed to handle cases).