



Digital Economy and Society Index (DESI) 2022

Finland

About the DESI

Since 2014, the European Commission has monitored Member States' progress in digital and published annual Digital Economy and Society Index (DESI) reports. 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. The DESI Index ranks Member States according to their level of digitalisation and analyses their relative progress over the last five years, considering their starting point.

The Commission has adjusted DESI to align it with the four cardinal points set out in the Commission proposal for a decision '[Path to the Digital Decade Policy Programme](#)' which is being negotiated by the European Parliament and the Council. The proposal sets targets at EU level to be reached by 2030 to deliver a comprehensive and sustainable digital transformation across all sectors of the economy. Of the DESI 2022 indicators, 11 measure targets set in the Digital Decade. In the future, the DESI will be aligned even more closely with the Digital Decade to ensure that all targets are discussed in the reports.

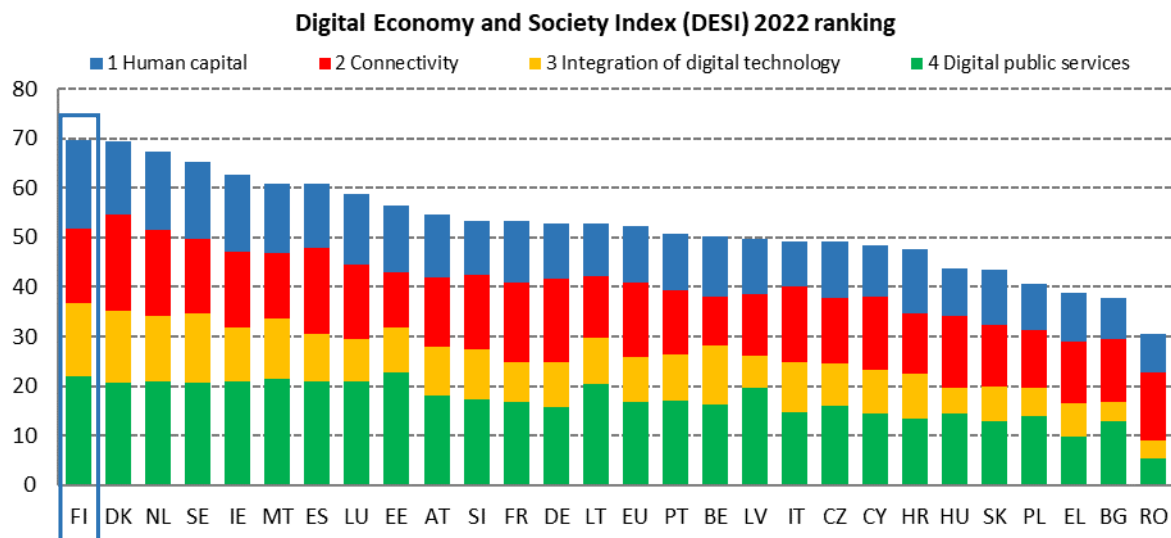
To date, digitalisation in the EU is uneven, although there are signs of convergence. While the frontrunners have remained unchanged, there is a substantial group of Member States that cluster around the EU average. Importantly, the majority of Member States that had a lower level of digitalisation 5 years ago, are progressing at a faster pace than the rest, indicating an overall convergence in digital in the EU.

Reaching the Digital Decade targets depends on a collective effort by all. Each Member State will contribute to this ambitious goal from a different starting point, determined by resources, comparative advantages and other relevant factors such as the population size, the scale of the economy and the areas of specialisation. For example, Member States with large economies or populations will need to perform well to enable Europe as a whole to reach the targets by 2030. Digital frontrunners will need to continue progressing to lead on digitalisation worldwide, while all Member States' digitalisation efforts will be driven by their economic and societal needs.

The DESI scores and rankings of previous years are re-calculated for all Member States to reflect changes in the underlying data. For further information, see the [DESI website](#).

Overview

	Finland		EU
	rank	score	score
DESI 2022	1	69.6	52.3



Finland ranks 1st of 27 EU Member States in the 2022 edition of the Digital Economy and Society Index (DESI). Finland continues to lead the EU countries on the indicators tracking human capital. The proportion of employed people working as ICT specialists is above EU average by nearly 3 percentage points (7.4% against 4.5%), ICT graduates in Finland account for 7.5% of all graduates, and the share of companies providing ICT training to their employees in Finland is almost twice the EU average. Moreover, the share of SMEs with at least a basic level of digital intensity was considerably above the EU average (82% against 55%), 66% of companies use cloud solutions and 16% integrate AI technology in their operations. Although Finland has already reached the Digital Decade target of 80% of the population with at least basic digital skills, it still needs to increase the percentage of ICT specialists in employment and the share of ICT graduates.

Finland is a leader in 5G commercial services provision. However, it lags behind in the provision of very high capacity network (VHCN) coverage in rural areas. The country intends to tackle that issue by implementing its national broadband plan and dedicated public funding. Its ability to meet the 2025-gigabit targets⁹ and the 2030 Digital Decade targets¹⁰ will depend on the impact of those measures in terms of overall availability of VHCN.

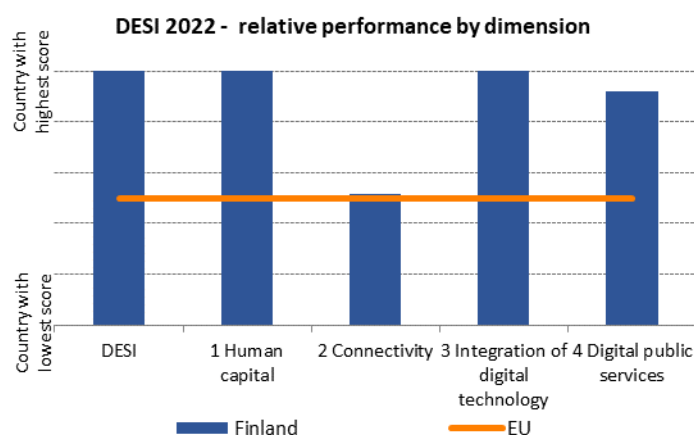
Finnish companies are also intensive users of social media (51% against the EU average of 29%), and of e-invoices (83% against the EU average of 32%). Last, online interaction between government authorities and the public is approaching the maximum with 92% of Finnish internet users using e-government services, almost the same as last year. Finland is well positioned to bring 100% of key public services online and reach the Digital Decade target for 2030 ahead of schedule.

In 2021, Finland continued to implement its digital strategies, including the [digital progress programme](#), [Digivisio 2030](#) and the [updated strategy on artificial intelligence](#). The country created

administrative structures or continued improving their operations, financed programmes in this area and developed or launched new systems. The options for future developments were proposed in a report '[Finnish technology policy in 2020s – a global leader through technology and information](#)' published by the Finnish Technology Advisory Board published the report.

To consolidate the legal framework, Finland enacted the [Cyber Security Development Programme](#), and the [Act on improving information security and data protection in critical sectors of society](#). The latter will help to achieve a sufficient level of information security in critical sectors of the economy and society, while the former aims to prepare the country to respond to longer-term threats. Finland welcomed the EU Digital Compass, [announcing the preparation of its own national one](#) in October 2021. Following that decision, a draft national digital compass has been sent to stakeholders for their comments in March 2022. Its adoption is planned for 2022. The purpose is to set national targets and indicators for the thematic areas set out in the EU Digital Decade and to create a coherent vision for long-term digital transformation. To this end, Finland set up the [Digital Transformation Ministerial Working Group](#) to direct the digitalisation of the public administration, the digital transformation, the data economy, information policy and cybersecurity. Part of the group's task is to draw up guidelines for the preparation of the national digital compass by the ministries. To support the Group's work and stakeholder engagement, Finland has established a permanent, inter-ministerial coordination group for digitalisation, DigiOffice.

Compared to the EU average, Finland continues to lead on most DESI indicators and keeps improving its excellent scores at a yearly growth above the average of countries with a similar score. Its performance in certain areas may be considered close to optimal or reaching saturation values, hence those may not increase further in the future.



Digital policy in Finland's Recovery and Resilience Plan (RRP)

The contribution to digital objectives in Finland's RRP accounts for EUR 574.3 million, representing 27.5% of the total RRP allocation¹. The plan focuses on reforms and investments in digital public services, digital skills and digital transition of the economy to exploit the full

¹ Each recovery and resilience plan has to dedicate at least 20% of the plan's total allocation to digital objectives. To this end, the plans had to specify and justify to what extent each measure contributes fully (100%), partly (40%) or has no impact (0%) on digital objectives, using Annex VII of the RRF Regulation. Combining the coefficients with the cost estimates of each measure allows assessing to what degree the plan contributes to digital objectives and whether it meets the 20% target.

potential of the digital transformation. The plan sets out for example support measures for the digital transition with investments of EUR 50 million in high-speed broadband infrastructure across Finland, EUR 85 million for the Digirail project to roll out the new automatic train protection system on the entire national railway network by 2040, along with the 4G and 5G-based Future Railway Mobile Communication System. The plan allocates EUR 100 million to digital innovation in social welfare and healthcare services; EUR 46 million to invest in continuous learning and EUR 25 million to invest in accelerating key technologies (microelectronics, 6G, artificial intelligence and quantum computing). Another EUR 20 million are allocated to streamline work and education-based immigration in order to facilitate international labour recruitment.

Implementation of the RRP started following its adoption in October 2021. Preparations of the digital projects are underway, with the launch of calls for proposals for the Microelectronics Important Projects of Common European Interest (IPCEI) in 2021.

1 Human capital

	rank	score	score
DESI 2022	1	71.4	45.7

	DESI 2020	Finland DESI 2021	DESI 2022	EU DESI 2022
1a1 At least basic digital skills	NA	NA	79%	54%
% individuals			2021	2021
1a2 Above basic digital skills	NA	NA	48%	26%
% individuals			2021	2021
1a3 At least basic digital content creation skills²	NA	NA	83%	66%
% individuals			2021	2021
1b1 ICT specialists	6.8%	7.6%	7.4%	4.5%
% individuals in employment aged 15-74	2019	2020	2021	2021
1b2 Female ICT specialists	21%	23%	24%	19%
% ICT specialists	2019	2020	2021	2021
1b3 Enterprises providing ICT training	37%	38%	38%	20%
% enterprises	2019	2020	2020	2020
1b4 ICT graduates	7.0%	7.4%	7.5%	3.9%
% graduates	2018	2019	2020	2020

Finland ranks 1st out of the 27 EU countries on human capital. Its digital skills level is well above the EU average in all the three indicators concerning digital skills. 79% of individuals have at least basic digital skills, approaching the target of 80% in the EU Digital Decade target, and 48% of individuals have above basic digital skills. The proportion of people employed as ICT specialists is at 7.4%, only slightly less than in the previous year. Finland's proportion of female ICT specialists of 24% is above the EU average of 19%. ICT graduates in Finland account for 7.5% of all the graduates, close to twice the EU average of 3.9%. The share of companies providing ICT training to their employees is also almost twice the EU average.

Building on its world-class educational system, the Ministry of Education and Culture launched the new literacies programme 2020-2022 to stimulate the development of targeted competences in ICT, media literacy and programming skills. To put the programme into practice, the ministry awarded a special grant to 46 development projects to draft competence descriptions in 2021-2022. Other grants were awarded to 22 providers of early childhood education and to 24 providers of pre-primary, primary and lower secondary education. Finland participated in the [2021 edition of EU Code Week](#) although participation was not particularly high.

In higher education, the [Digivisio 2030 programme](#) adopted in 2020 secured the commitment of all 38 of Finland's higher education institutions. They signed an agreement to jointly create new digital services, starting with continuous learning. The programme is developing a platform that in the first phase will pool the continuous learning opportunities from all higher education institutions in one place, making them easy to find.

The [LUMA centre](#) (an organisation boosting cooperation between schools, universities, and business) continued to motivate children to study STEM subjects by using the most recent pedagogical methods. It also supported lifelong learning for teachers and strengthened research-based teaching.

² Break in series for indicators 1a1, 1a2 and 1a3. Figures are not comparable with those in earlier DESI reports.

Digital skills featured in the [continuous learning reform](#) that the Finnish Parliament adopted in December 2020. The reform promotes opportunities for working age people to develop their competences and ensures the availability of skilled labour. In line with the plan, Finland launched a digital service combining education and training, guidance and information on the labour market, and a set of intelligent e-services operating as a platform for a continuous learning system.

The Ministry of Employment and Economy in cooperation with the Ministry of Education and Culture set up an expert group, the [Do Digi Forum](#) to promote digital skills development. The 37 members of the forum represent a wide range of social groups. The forum's work links to the national coalition on digital skills and jobs launched by the European Commission.

Finland announced that it would simplify administrative procedures through an online service platform that consolidates public and private-sector services for foreign workers arriving in Finland. It is expected to include information on job opportunities, matching potential workers and employers, reliable data-sharing between users on the platform, and assistance in managing the administrative process. The project aims to help companies recruit ICT specialists for hard-to-fill vacancies.

Finland's consistent implementation of its programmes and strategies in 2021 yielded many advantages for the economy, resulting in an increase in the quality of life. The [WORK2030 programme for work and well-being at work](#) aims to accelerate the reform of practices and the use of new technology in Finnish workplaces, foster a work culture based on cooperation and trust, and make Finland a leading developer of work-life innovation in the digital age. The goal is to make Finland the world leader in well-being at work by 2030.

2 Connectivity

	rank	score	score
DESI 2022	8	60.5	59.9

	Finland		EU	
	DESI 2020	DESI 2021	DESI 2022	DESI 2022
2a1 Overall fixed broadband take-up	57%	57%	61%	78%
% households		2020	2021	2021
2a2 At least 100 Mbps fixed broadband take-up	23%	26%	29%	41%
% households	2019	2020	2021	2021
2a3 At least 1 Gbps take-up	0.90%	0.95%	1.45%	7.58%
% households	2019	2020	2021	2021
2b1 Fast broadband (NGA) coverage	75%	75%	75%	90%
% households	2019	2020	2021	2021
2b2 Fixed Very High Capacity Network (VHCN) coverage	62%	67%	68%	70%
% households	2019	2020	2021	2021
2b3 Fibre to the Premises (FTTP) coverage	35%	38%	40%	50%
% households	2019	2020	2021	2021
2c1 5G spectrum	67%	99%	99%	56%
Assigned spectrum as a % of total harmonised 5G spectrum	04/2020	09/2021	04/2022	04/2022
2c2 5G coverage³	NA	12%	72%	66%
% populated areas		2020	2021	2021
2c3 Mobile broadband take-up	92%	92%	96%	87%
% individuals	2018	2018	2021	2021
2d1 Broadband price index	75	74	79	73
Score (0-100)	2019	2020	2021	2021

Finland ranks 8th in connectivity among EU countries. There is a noticeable divide regarding fixed network coverage as availability of very high capacity networks (VHCN) is uneven across the country due to the lack of economic incentives to roll out in sparsely populated areas. This issue was partially tackled when the country amended specific State Aid rules in 2018, which resulted in more areas gaining fibre network cover. However, some disparities in its availability still remain. Many sparsely populated areas still do not have any VHCN availability or are served by only one VHCN. Although Finland's rate of fixed VHCN coverage is close to the EU average (68% compared with an EU average of 70%), it scores low (12.4%) in rural areas. The government intends to extend VHCN coverage by implementing its national broadband plan and the digital infrastructure strategy, though it did not succeed in granting funding for broadband projects in 2021⁴. Besides, funds worth EUR 16 million for building fibre networks were reserved in 2021 from the European Agricultural Fund for Rural Development (EAFRD).

³ The 5G coverage indicator does not measure users' experience, which may be affected by a variety of factors such as the type of device used, environmental conditions, number of concurrent users and network capacity. 5G coverage refers to the percentage of populated areas covered by at least one operator as reported by operators and national regulatory authorities.

⁴ The government had reserved EUR 5 million for 2021. However, this amount was not distributed due to the legislative changes needed to the upcoming ones of the General Block Exemption Regulation. Those funds are still available for broadband deployment. The Act on aid for broadband construction 1262/2020 was amended in Parliament so that as of 3 February 2022 it would only allow aid to fibre networks.

Finland also aims to achieve very high capacity connectivity for at least 25 000 dwellings in commercially challenging areas before the second half of 2026 with funding from the RRF. Finland's Recovery and Resilience Plan includes measures to improve very high-capacity connectivity, particularly in rural areas. To support the digital transition, the plan will invest EUR 50 million in the rollout of VHCN, which should benefit those white spot areas.

Fixed broadband take-up is low at all speeds: 61% of households use fixed broadband (compared with an EU average of 78% of households), 29% of households have fixed broadband at 100 Mbps (compared to an EU average of 41%) and only 1.45% of households have fixed broadband at 1 Gbps (compared to an EU average of 7.58%). The low take-up does not appear to be correlated with price. Indeed, Finland's broadband prices are good compared with other EU countries: its broadband price index stood at 79, above the EU average of 73. Take-up might be explained by Finland's low VHCN coverage in rural areas. The low take-up of fixed broadband may also be explained by a considerable number of end users choosing to switch to mobile broadband instead. Finland's mobile market is characterised by high mobile broadband take-up (at 96% against the EU average of 85%). In 2021, there were 9.2 million mobile subscriptions on the market, including 62% of subscriptions for a service of at least 100 Mbps⁵.

The country features ubiquitous 4G coverage and 5G coverage available in 72% of populated areas. The high coverage of 5G is linked to the early availability of the 5G pioneer bands: the 700 MHz band was auctioned in 2016, the 3.6 GHz band in 2018 and the 26 GHz band in 2020. As regards the use of the 3.6 GHz band in neighbouring areas with Russia, licence holders⁶ in that frequency band can now use 130 MHz each in the 3410-3800 MHz band they got from the auction with considerably smaller coordination distances than those stipulated under the applicable radio regulations. This change is expected to positively impact the provision of 5G commercial services in the areas concerned.

Main market & regulatory developments

Three main operators compete on both the fixed and the mobile markets: Telia Company, Elisa and DNA. Several national and regional players invest in fibre networks in addition to those three operators.

The market saw several noticeable business transactions in 2021. On 29 December 2021, Telia Company completed the divestment of 49% of its tower business in Finland and Norway to the asset manager Brookfield and the Swedish pension fund Alecta. The reported aim of the transaction was to keep developing Telia's digital infrastructure. In November 2021, the operator Elisa acquired Verkko-osuuskunta Kuitukanava⁷'s fibre network. Also in December 2021, Ålands Telefonandelslag acquired Mariehamns Telefon Ab⁸.

In terms of market patterns, the fixed market is seeing a decommissioning of the copper network. The three main market players Elisa, Telia and DNA have already stopped selling PSTN and ADSL subscriptions. Traficom estimates that most operators will stop selling PSTN and ADSL within five years.

⁵ Source: Traficom.

⁶ Telia Company, Elisa and DNA.

⁷ A regional fibre cooperative.

⁸ Both companies are regional incumbents on the Åland Islands.

The voice call market is witnessing a switch from fixed-to-mobile as there are only 224 000 fixed telephone lines left (of which 158 000 are business subscriptions), while the number of mobile subscriptions stood at 9.23 million in 2021⁹.

In terms of market regulation, Traficom is carrying out new market analysis for markets 3a (wholesale local access provided at a fixed location), 3b (wholesale central access provided at a fixed location for mass-market products) and 4 (wholesale high-quality access provided at a fixed location) in the 2014 Recommendation on relevant markets. Market 4/2014 is currently entirely deregulated following the Supreme Court's judgment of June 2021, which annulled Traficom's market analysis in that field¹⁰.

As regards universal service, a decree entered into force on 25 October 2021 increasing the minimum data speed of the right to internet connection from 2 to 5 Mbit/s.

An expert group on physical infrastructure expert group led by Traficom is evaluating and implementing the best practices recommended in the connectivity toolbox. Some of those practices identified as the most relevant for the Finnish context include streamlining permit granting procedures for civil works and improving the Single Information Point. The best practice that aims to reduce the environmental footprint of networks is also advancing. It will be monitored using an initial set of indicators that Traficom developed. The practices concerning spectrum were mostly in place before the introduction of the toolbox.

The Act on electronic communications services was amended on 30 December 2020 and entered into force in early 2021. It implemented Directive 2018/1972 establishing the European Electronic Communications Code.

Finland is a front-runner in 5G commercial deployment. However, the coverage of fixed VHCN is uneven and depends on the geographic area. The take-up of 1Gbps is still very low. Finland intends to tackle the VHCN coverage issue by continuing to carry out its national broadband plan and using public funding from the Recovery and Resilience Facility. Its ability to meet the 2025 Gigabit targets¹¹ and the Digital Decade targets¹² will depend on the impact of those measures in terms of overall availability of VHCN, including fibre to the premises throughout the country.

⁹ Source: Traficom.

¹⁰ The Supreme Court considered that Traficom's market analysis should have included more comprehensive cost-related assessments.

¹¹ Gigabit connectivity for all of the main socio-economic drivers, uninterrupted 5G coverage for all urban areas and major terrestrial transport path; access to connectivity offering at least 100 Mbps for all European households.

¹² All European households are covered by a gigabit network, all populated areas are covered by 5G.

3 Integration of digital technology

	rank	score	score
DESI 2022	1	59.1	36.1

	Finland		EU	
	DESI 2020	DESI 2021	DESI 2022	DESI 2022
3a1 SMEs with at least a basic level of digital intensity	NA	NA	82%	55%
% SMEs			2021	2021
3b1 Electronic information sharing	43%	43%	48%	38%
% enterprises	2019	2019	2021	2021
3b2 Social media	44%	44%	51%	29%
% enterprises	2019	2019	2021	2021
3b3 Big data	19%	22%	22%	14%
% enterprises	2018	2020	2020	2020
3b4 Cloud	NA	NA	66%	34%
% enterprises			2021	2021
3b5 AI	NA	NA	16%	8%
% enterprises			2021	2021
3b6 ICT for environmental sustainability	NA	77%	77%	66%
% enterprises having medium/high intensity of green action through ICT		2021	2021	2021
3b7 e-Invoices	79%	83%	83%	32%
% enterprises	2018	2020	2020	2020
3c1 SMEs selling online	22%	18%	23%	18%
% SMEs	2019	2020	2021	2021
3c2 e-Commerce turnover	NA	NA	NA	12%
% SME turnover	2019	2020	2021	2021
3c3 Selling online cross-border	9%	9%	8%	9%
% SMEs	2019	2019	2021	2021

Finland ranks 1st among EU countries on the integration of digital technology, scoring well above the EU average on most indicators. Some 82% of Finnish SMEs have at least a basic level of digital intensity, considerably above the EU average of 55%. Advanced technologies continued to be at the heart of Finnish business functions, with 66% using cloud solutions and 16% integrating AI technology in their operations: twice the EU average for both indicators. The proportion of companies that share information electronically is 48% compared to the EU average of 38%. Finnish companies are intensive users of social media - 51% versus the EU average of 29%. E-invoice use by companies is common (83%), while 77% of companies make a medium to high intensity use of ICT for environmental action.

In 2021, Finland continued to implement its [digital progress programme adopted in 2020](#). The main governmental organisation supporting businesses in line with this policy is [Business Finland](#). It funded a range of activities in research and development to support new small companies. For instance, the microelectronics and photonics ecosystem received assistance through national co-innovation projects in the fields of 6G technology, quantum processors, silicon photonics, SoCs (System-on-Chip), SoC design capabilities (including emulation and simulation), MEMS technology, black silicon, and conformal, printable and sustainable electronics. In addition to these areas, Finland also funded innovation projects under the programme *Kasvumoottorit* (growth engines) on the use of data and the development of digital platforms. In the field of smart mobility, leading companies in digital ecosystems received [funding](#).

Early-stage innovation also received support. Government funding has been an important enabler for many Finnish start-ups, making it possible to lower the risk related to their R&D activities. The programmes that aim to accelerate early-stage growth of innovative start-ups provide EUR 130 million of funding per year. For instance, a recently launched Tempo programme provides EUR 50 000 in grants to accelerate the early-stage growth of innovative start-ups.

Finland participates in the Microelectronics and Communication Technologies IPCEI (ME-CT IPCEI). It has pre-notified three projects that concentrate on developing MEMS sensor platforms, RF wafers and 5/6G and EDGE AI chip design skills. The country is also a member of the EuroHPC Joint Undertaking and will host the Lumi, one of the three pre-exascale [supercomputers](#). Preparations are underway to make Lumi fully operational by mid-2022. The Lumi supercomputer will create completely new opportunities for unprecedented scientific break-throughs especially in interdisciplinary and data-intensive research areas. Also, 20% of the capacity is reserved for business which opens up new opportunities for companies to innovate and develop new data-based business forms such as the platform economy and artificial intelligence. Finland participates in the European Blockchain Partnership. Finland also supports the digital transformation of local businesses and communities via the VTT Technical Research Centre under the multiannual 2018-2022 [digital Finland framework](#) with a budget of EUR 400 million.

European Digital Innovation Hubs (EDIHs) will provide access to technical expertise and experimentation for enterprises. The selection of the DIHs that will participate in the network of EDIHs is ongoing. Four Finnish EDIH proposals have successful evaluation results¹³ and three other proposals have received a Seal of Excellence.

With the November 2020 update of the [AI strategy](#), the government encouraged the development and introduction of AI in companies. It plans to embed AI in a wide array of other technologies such as the internet of things, 3D printing, robotics, quantum computing, and virtual and augmented reality. Funding has been secured for 2019-2022 for the AI business programme (EUR 100 million) and for the Finnish Centre for Artificial Intelligence (FCAI, EUR 8.3 million). An example is the [FCAI – Finnish Centre for Artificial Intelligence](#) funded by the Academy of Finland. It is a community of talents from academia, industry and the public sector working together to solve real-life problems using existing and new AI applications. FCAI is one of Academy of Finland's '[Finnish flagships](#),' hubs for top-level research and impact.

In June 2021, the government adopted the [Cyber Security Development Programme](#) and a resolution on improving information security and data protection in critical sectors of society. This act will ensure a sufficient level of information security in critical sectors of the economy and society, while the cyber security programme aims to build preparedness against cyber threats over the longer term.

Finnish businesses perform well on the integration of digital technologies. One of the main forces driving this integration is cooperation between universities, specialised government agencies and businesses. In the long run, even deeper integration of digital technologies could improve the international reach of the Finnish companies, which will be necessary for Finland to remain competitive globally.

¹³ I.e. are invited for grant agreement preparation (which is not a formal commitment for funding).

4 Digital public services

4 Digital public services ¹⁴	rank	score	score
DESI 2022	2	87.4	67.3

	DESI 2020	Finland DESI 2021	DESI 2022	EU DESI 2022
4a1 e-Government users	91%	91%	92%	65%
% internet users	2019	2020	2021	2021
4a2 Pre-filled forms	NA	NA	90	64
Score (0 to 100)			2021	2021
4a3 Digital public services for citizens	NA	NA	90	75
Score (0 to 100)			2021	2021
4a4 Digital public services for businesses	NA	NA	93	82
Score (0 to 100)			2021	2021
4a5 Open data	NA	NA	86%	81%
% maximum score			2021	2021

In Digital public services, Finland ranks 2nd among EU countries, scoring well above the EU average. Online interaction between government authorities and the public is approaching the maximum level with 92% of Finnish internet users using e-government services. The country performs very well on pre-filled forms (90%), and on providing online services for both individuals and businesses (scoring 90 and 93, compared to EU averages of 75 and 82 respectively). Finland scores above the EU average on open data, too.

Last year saw the continuation of previously launched programmes. The country refined the architecture of e-government services. A few registration services were integrated after merging into the [Digital and Population Data Services Agency](#) and continued to provide data. The Valtori [ICT centre](#) after being placed under direct supervision of the Ministry of Finance, continued providing ICT services for central government and facilitating intergovernmental tasks. The AuroraAI network that aims to provide services to citizens to help them going through bureaucratic arrangements related to their life events (accidents, certificates etc.) is at pilot stage. At the same time, operating models have been developed to enable human-centric operations of organizations.

In view of future challenges in September 2021 the government appointed a [Ministerial Working Group on Digitalisation, Data Economy and Public Administration](#). Cybersecurity was added to the group's tasks in March 2022. Its purpose is to guide the development of the public administration, digitalisation, the data economy, information policy, and cybersecurity. In parallel, the ministries dealing with digital aspects e.g. the Ministry of Transport and Communications, the Ministry of Finance and the Ministry of Employment and the Economy set up a new group, the DigiOffice to coordinate inter-ministerial cooperation on digitalisation and the data economy.

Following the Commission's publication of the Digital Compass, the government set the goal for Finland to be the first in the EU to create a national digital compass by the end of 2022. It also aimed to create a mechanism to evaluate national developments and the effectiveness of the actions taken.

¹⁴ There is break in the series for indicators 4a2, 4a3, 4a4 and 4a5. As a result, no comparison of indicator and dimension results is possible over time.

In e-Health, Finland can achieve the Digital Compass goals with relative ease as the personal health record system is already available for everyone: people can browse their medical records and prescriptions on the national portal [My Kanta](#). MyKanta-pages support several use cases e.g., managing consent, requesting a prescription renewal or saving a living will and organ donation testament. Additionally, through MyKanta, it is possible to store personal welfare data and share it with the authorities.

Finland launched the process to update its digital identity infrastructure. A government-driven large-scale digital identity project is underway in 2020-2023. It aims to develop next-generation electronic identification for Finns and for anyone accessing e-services in Finland. That would translate into equal conditions for all to use the digital identity in social services first, and later in health services, making it possible to expand the personal data that the authorities confirm as transmissible to the other party when using the services.

The [national open data portal](#) continued to provide data in open formats for companies and the public. Following previous observations that Finland is underachieving given its ambitions, the government ran a programme to encourage wider and more efficient use of public data for societal and economic purposes over the period 2020-2022. The focus has been on preparing strategic objectives for opening up and using public sector data, operating framework as well as quality criteria for data and API principles for public government.

The [Digital Twin concept](#) is a recently launched programme to create a national digital register that mirrors the built environment. It is based on widely used standards to ensure compatibility with other countries' projects. The project is overseen by the Ministry of Environment.

The regulation of automatic decision-making in public administration is progressing, and the proposal for legislation allowing automatic administrative decisions is up for public consultation since March 2022. The aim is to adopt the legislation by the end of 2023. Before preparing the national legal instruments further, Finland is waiting for the Artificial intelligence act to clarify the rules around the used AI in public administration.

Finland is an EU leader in most e-government indicators as it has kept pace with fast-changing technology, integrating it in efficient solutions for its population, businesses and the public sector. At central government level, the [Ministerial working group and the Digital office](#) give political impetus for the change, while continuing to refine existing solutions. Increasing threats to cybersecurity and new challenges brought about by AI applications are the issues that this structure will tackle. That may prove to be more difficult at local government level, therefore Finland will need to monitor developments across the country to ensure even results.

Highlight: Cybersecurity in the public administration

Finland has a long tradition of information and cybersecurity preparedness with clear roles and division of tasks between the authorities based on legislation. Recently, Finland increased its cyber preparedness level allocating public funding to that effect. The ministerial working group on developing the digital transformation, the data economy and public administration is also responsible for cybersecurity and the preparedness of public administration. The group has surveyed and prioritised needs for actions and investments on cyber security. The Ministry of Transport and Communications together with the director for cybersecurity provide the government with the situational picture and coordinate actions horizontally in case of severe

cybersecurity disruptions. A newly established inter-ministerial group for horizontal coordination secures the flow of information and coordination in severe threats and disruptive situations. Finland is well anchored with the EU's strategic and operational cooperation in preparedness, contingency planning and combating cyber threats.