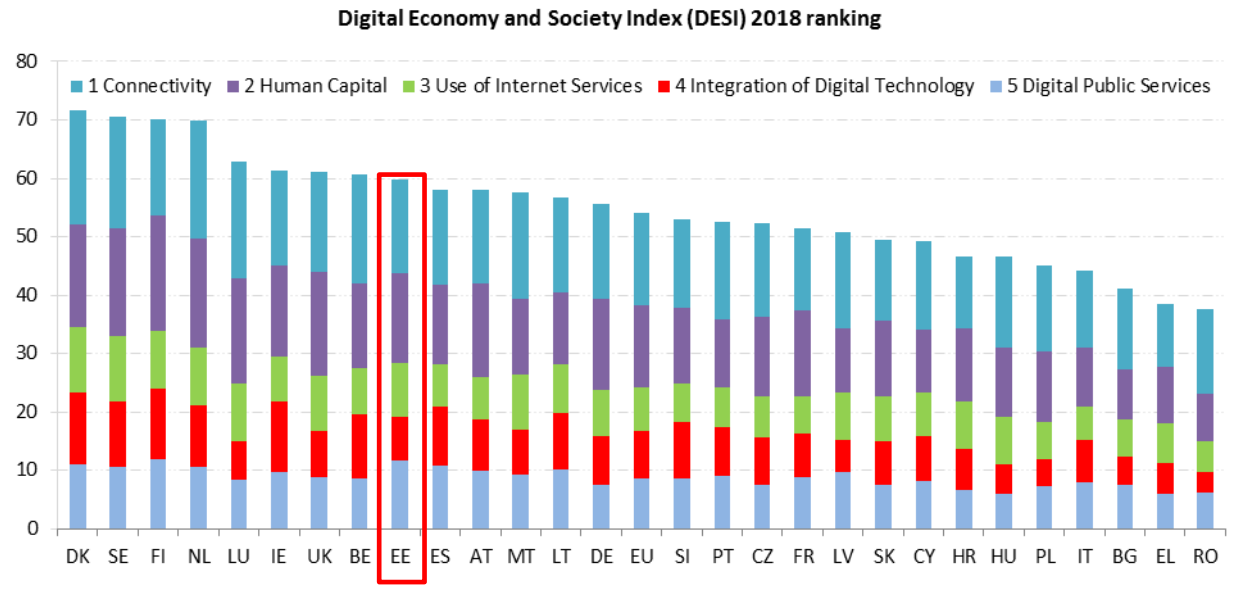
Digital Economy and Society Index (DESI)[1] 2018 Country Report Estonia

The DESI report tracks the progress made by Member States in terms of their digitisation. It is structured around five chapters:

1 Connectivity	Fixed broadband, mobile broadband and prices
2 Human Capital	Internet use, basic and advanced digital skills
3 Use of Internet Services	Citizens' use of content, communication and online transactions
4 Integration of Digital Technology	Business digitisation and e-commerce
5 Digital Public Services	eGovernment and eHealth

The DESI was re-calculated for the previous years for all countries to reflect slight changes in the choice of indicators and corrections to the underlying indicator data. As a result, country scores and rankings may have changed from the previous publication. For further information please consult the DESI methodological note at https://ec.europa.eu/digital-single-market/en/desi.



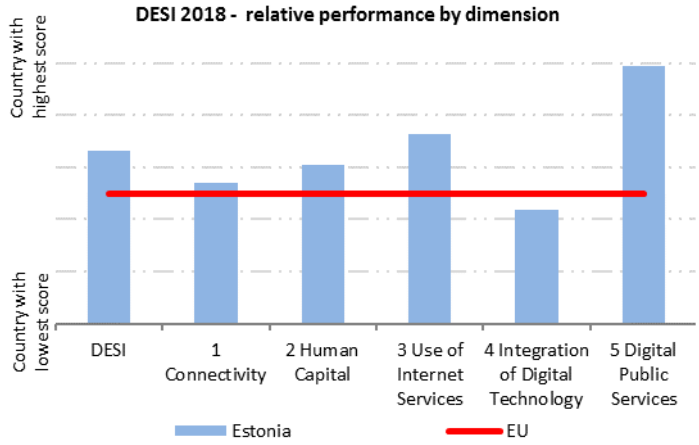
[1] https://ec.europa.eu/digital-single-market/en/desi

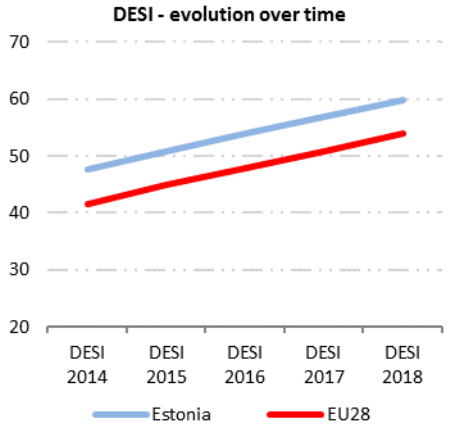
	Estonia		Cluster	EU
	rank	score	score	score
DESI 2018	**9**	**59.7**	**64.0**	**54.0**
DESI 2017	8	57.0	61.2	50.8

Estonia ranks 9th out of the 28 EU Member States. The country progressed over the last year but more slowly than the EU average. Estonia remains a leading country in Europe for digital public services, as it has been for many years. Its citizens are well-skilled in the use of digital technologies and are keen users of a variety of internet services. Regarding connectivity, fixed broadband coverage is very low (partially compensated by mobile coverage), as is the take-up of ultrafast broadband. The key challenge in the Estonian economy remains the digitisation of companies.

Estonia belongs to the high-performing cluster of countries.[2]

The current Estonian Digital Agenda 2020[3] sets out the general objective to "contribute to achieving higher growth, more jobs and increased welfare by creating an environment supporting the use and development of ICT solutions". It sets out a vision, principles, sub-objectives and measures with targets, indicators and action lines. The implementation of the strategy in Estonia is steered by the e-Estonia Council led by the Prime Minister.





[2] High-performing countries are Denmark, Sweden, Finland, the Netherlands, Luxembourg, Ireland, the UK, Belgium and Estonia.

[3] https://www.mkm.ee/sites/default/files/digital_agenda_2020_estonia_engf.pdf

1 Connectivity

1 Connectivity	Estonia		Cluster	EU
	rank	score	score	score
DESI 2018	**15**	**64.1**	**71.9**	**62.6**
DESI 2017	10	62.1	67.9	58.5

	Estonia				EU
	DESI 2018		DESI 2017		DESI 2018
	value	rank	value	rank	value
1a1 Fixed Broadband Coverage ↓ % households	**89 %** 2017	**25**	**91 %** 2016	**25**	**97 %** 2017
1a2 Fixed Broadband Take-up ↑ % households	**78 %** 2017	**9**	**77 %** 2016	**8**	**75 %** 2017
1b1 4G Coverage ↑ % households (average of operators)	**96 %** 2017	**14**	**94 %** 2016	**8**	**91 %** 2017
1b2 Mobile Broadband Take-up ↑ Subscriptions per 100 people	**125** 2017	**5**	**116** 2016	**4**	**90** 2017
1c1 Fast Broadband (NGA) Coverage ↑ % households covered by VDSL, FTTP or Docsis 3.0	**80 %** 2017	**19**	**79 %** 2016	**17**	**80 %** 2017
1c2 Fast Broadband Take-up ↑ % homes subscribing to >= 30 Mbps	**29 %** 2017	**19**	**24 %** 2016	**19**	**33 %** 2017
1d1 Ultrafast Broadband Coverage % households covered by FTTP or Docsis 3.0	**71 %** 2017	**16**	**NA**		**58 %** 2017
1d2 Ultrafast Broadband Take-up ↑ % homes subscribing to >= 100 Mbps	**9.0 %** 2017	**22**	**6.6 %** 2016	**21**	**15.4 %** 2017
1e1 Broadband Price Index ↑ Score (0 to 100)	**85** 2017	**17**	**83** 2016	**18**	**87** 2017

With an overall Connectivity score of 64.1, Estonia did not progress and dropped a few ranks compared to 2017, meaning it is now in 15th position among EU countries.

Estonia continues to lag behind on the fixed broadband market with a coverage of 89 %, mainly due to low rural availability. The slight decrease in fixed broadband coverage is caused mainly by the closing of wireless local loop services that used obsolete CDMA 450 technology. These fixed wireless networks have been taken over by mobile network data services.

Remarkably, most of the households that are covered in Estonia by NGA networks have access to speeds of 100 Mbps or above. Indeed, ultra-fast coverage in Estonia outperforms the EU average by 13 percentage points. However, take-up of these fast networks still remains low and below the EU average.

By contrast, Estonia performs very well when it comes to mobile coverage: 4G has already reached 96 % of the population and Estonia is a leader in mobile broadband take-up with 125 subscriptions per 100 people.

Estonia's connectivity targets are to provide all residents with internet access above 30 Mbps and to achieve at least 60 % household subscription rates for speeds above 100 Mbps by

2020. The Estonian regulator ETRA has developed a website www.netikaart.ee with information about fixed and mobile connectivity capabilities at household level. This website was made publicly available in October 2017.

One key measure to achieve the national targets is the "Estonian Wideband Infrastructure Network" (EstWin) project, launched in 2009 by the Estonian Ministry of Economic Affairs and Communications. The objective of the project is to roll out 6 600 km of optical cables (backhaul) in rural areas and settlements with fewer than 10 000 inhabitants, where optical networks did not exist and are not planned by operators. The target is that by 2020, 98 % of households, enterprises and institutions should be no further than 1.5 km from the EstWin network and all existing network nodes should be connected with core networks. These networks are rolled out by non-profit organisations required to provide wholesale access on equal terms to all operators and public authorities. Approximately 85 % of the project costs are financed by the European Regional Development Fund (ERDF), while the remaining 15 % of the network construction cost is co-financed by backhaul network operators.

By the end of 2017, 5 300 km of backhaul network had been rolled out and approximately 1 700 network nodes had been connected, 500 of them located in buildings belonging to local governments (schools, libraries, etc.). Most of the remaining kilometres will be built in 2018. The Estonian government plans to carry out a public tender in 2018 to find a provider for the last mile access part in NGA white areas, and is currently working out the conditions for this tender. The government is creating a support mechanism that will allocate EUR 20 million rto carry out this project.

Estonia is a frontrunner for mobile coverage and uptake. In 2017, it continued to expand its 4G mobile deployment, meaning it remains amongst EU's top performers in this regard. Estonia can also boast of high coverage with ultra-fast broadband and in the presence of this widespread supply, more demand-side incentives and more competitive prices could also improve its take-up.

Deploying broadband in rural areas continues to be a challenge in Estonia. The successful completion of the EstWin project is therefore of high importance. Furthermore, the last mile project, which is going to be carried out in the coming years, provides an opportunity to improve connectivity even in remote parts of the country.

2 Human Capital

2 Human Capital	Estonia		Cluster	EU
	rank	score	score	score
DESI 2018	**10**	**61.4**	**70.7**	**56.5**
DESI 2017	9	58.0	69.4	54.6

	Estonia					EU
	DESI 2018			DESI 2017		DESI 2018
	value		rank	value	rank	value
2a1 Internet Users	**86%**	↑	**8**	**85%**	**8**	**81%**
% individuals	2017			2016		2017
2a2 At Least Basic Digital Skills	**60%**	→	**10**	**60%**	**10**	**57%**
% individuals	2017			2016		2017
2b1 ICT Specialists	**5.3%**	↑	**3**	**4.4%**	**6**	**3.7%**
% total employment	2016			2015		2016
2b2 STEM Graduates[4]	**12.8**	↓	**25**	**13.5**	**25**	**19.1**
Per 1000 individuals (aged 20-29)	2015			2014		2015

Estonia is progressing as regards Human Capital dimension. It ranks 10th and performs better than the EU average. Both the number of internet users and the percentage of individuals with at least basic digital skills remain stable and at higher levels than the EU-28 average. The percentage of people with at least basic digital skills is higher among the employed persons (67.8 %) than the unemployed (53.5 %) and among those living in urban areas (66 %) compared to those in rural ones (56.4 %).

Estonia recognises the importance of digital skills for competitiveness and economic growth, and digital skills are a policy priority in both the Digital Agenda 2020 for Estonia and the Estonian Lifelong Learning Strategy 2020. Specifically, the very good availability of online services has been complemented by efforts to improve the digital skills of the population. As a result, Estonia is one of very few countries where there is no gender gap, and groups that are often disadvantaged are less exposed to the risk of digital exclusion. The percentage of people with at least basic digital skills is almost twice the EU average for less-educated people (58.5 % against 30.8 % at EU level) and it is higher for people with a disadvantage factor (44.2 % against 40 % at EU level), the unemployed (53.5 % against 44.8 %) and people living in rural areas (56.4 % against 49.3 %).

The share of ICT Specialists as a percentage of the workforce (5.3 %) is well above the EU average and Estonia now ranks 3rd in the EU. Nevertheless, the number of graduates in science and technology (STEM), which includes not just ICT but also other technical disciplines, is below the EU average and is decreasing over time (now ranking 25th).

The Estonian Lifelong Learning Strategy 2020 has ‘A digital focus on lifelong learning’ as one of five priorities and there are several action lines that will be implemented through the strategy. The government is supporting general education and vocational education and

[4] The most recent data has been used in DESI 2018. It may refer to 2016 or 2015 depending on the Member State. This is reflected in the 2018 DESI ranking. Historical data has been updated by Eurostat.

training (VET) schools, trying to incentivise cooperation between schools and an exchange of best practices to make learning more practical and modern. Through the Estonian IT Foundation for Education, the Ministry of Education and Research also helps basic schools acquire digital equipment.

The digital plans of basic schools for improving the organisation of courses and developing skills with digital tools were made public in autumn 2017. These plans map opportunities for improving the organisation of courses with digital equipment and for developing the digital skills of teachers and pupils. The publication of these digital plans will allow schools to share their best practices and find the smartest solutions for the use of digital tools in the organisation of studies (see the Development in Academic Year 2017/2018).

For the first time, standard tests of digital competence will be carried out among 9th and 12th year students in VET schools in the 2017/2018 academic year. This stresses the importance of students developing digital skills and competences, and follows up on the 2014 decision to include digital competences in national curricula, as a cross-curricular competence. Analysing the results of the standardised tests will help schools develop their pupils' digital competences.

Estonia recognises the importance of enhancing citizens' digital skills since they are a pre-condition for inclusive labour markets, improved productivity and sustained economic growth. In 2017, two projects were implemented that are directly targeted at improving citizens' digital skills. The e-Community project aims to develop a sustainable network of training centres based in local libraries. Over a three-year period, more than 1 000 librarians will be trained and equipped with training materials related to basic technology usage but also e-services, social media, cybersecurity, etc. The Digital ABC project focuses on people working in the manufacturing industry and provides training in basic digital skills in order to raise their confidence in using technology.

3 Use of Internet

3 Use of Internet	Estonia		Cluster	EU
	rank	score	score	score
DESI 2018	**8**	**61.6**	**63.4**	**50.5**
DESI 2017	6	60.0	60.5	47.5

	Estonia				EU
	DESI 2018		DESI 2017		DESI 2018
	value	rank	value	rank	value
3a1 News % individuals who used Internet in the last 3 months	**90%** ↑ 2017	**5**	**89%** 2016	**3**	**72%** 2017
3a2 Music, Videos and Games % individuals who used Internet in the last 3 months	**84%** 2016	**9**	**84%** 2016	**9**	**78%** 2016
3a3 Video on Demand % individuals who used Internet in the last 3 months	**24%** 2016	**9**	**24%** 2016	**9**	**21%** 2016
3b1 Video Calls % individuals who used Internet in the last 3 months	**50%** ↑ 2017	**15**	**47%** 2016	**12**	**46%** 2017
3b2 Social Networks % individuals who used Internet in the last 3 months	**68%** ↑ 2017	**20**	**66%** 2016	**20**	**65%** 2017
3c1 Banking % individuals who used Internet in the last 3 months	**90%** → 2017	**4**	**90%** 2016	**4**	**61%** 2017
3c2 Shopping % internet users (last year)	**65%** ↑ 2017	**12**	**64%** 2016	**13**	**68%** 2017

Compared to the EU average, Estonians are very active users of internet services. They are very confident in using internet banking (90 %), scoring 29 points above the EU average, but they are also intensive consumers of various online services including news, video on demand, music and games. The percentage of people shopping online among those who used the internet in the last year is also increasing and is comparable with the EU average.

4 Integration of Digital Technology

4 Integration of Digital Technology	Estonia		Cluster	EU
	rank	score	score	score
DESI 2018	**19**	**37.1**	**47.0**	**40.1**
DESI 2017	20	31.6	44.0	36.7

	Estonia					EU
	DESI 2018			DESI 2017		DESI 2018
	value		rank	value	rank	value
4a1 Electronic Information Sharing	**28%**	↑	**21**	**22%**	**23**	**34%**
% enterprises	2017			2015		2017
4a2 RFID	**4.4%**	↑	**17**	**2.7%**	**25**	**4.2%**
% enterprises	2017			2014		2017
4a3 Social Media	**13%**	↑	**24**	**12%**	**23**	**21%**
% enterprises	2017			2016		2017
4a4 eInvoices	**19.7%**	↑	**10**	**18.5%**	**12**	**NA**
% enterprises	2017			2016		2017
4a5 Cloud	**NA**			**16.5%**	**8**	**NA**
% enterprises	2017			2016		2017
4b1 SMEs Selling Online	**15.4%**	↑	**17**	**15.3%**	**16**	**17.2%**
% SMEs	2017			2016		2017
4b2 E-commerce Turnover	**11.4%**	↑	**10**	**10.7%**	**8**	**10.3%**
% SME turnover	2017			2016		2017
4b3 Selling Online Cross-border	**8.3%**	↑	**15**	**6.1%**	**19**	**8.4%**
% SMEs	2017			2015		2017

Although Estonia still lags behind in the integration of digital technologies compared to the EU average, the country made progress over the last year. This is the dimension in which Estonia performs least well and ranks 19th (from 20th) in DESI 2018. Estonia is performing relatively better in e-commerce compared to eBusiness. In fact, the percentage of SMEs selling online is slightly above the EU average (15.4 % compared to 10.7 %). E-commerce proves to be a channel that can guarantee significant turnover (11.4 % of their turnover versus 10.3 % in the EU), including by looking for opportunities in markets abroad (8.3 % of SMEs are selling online cross-border). 17.1 % of the enterprises selling online to other EU countries reported that the high cost of delivery is the main trade barrier. On the other hand, 75.9 % of the enterprises reported no difficulties.

The country shows a good performance in ICT start-ups[5]. Regarding the specific ICT sector, companies do not report any difficulties in recruiting ICT specialists. However, enterprises in manufacturing sectors encounter problems in finding specialists such as experts in mechatronics or robotics. This might be a reason for the mixed performance in terms of Integration of Digital Technologies. Estonia does not have a specific strategy in place for the digitisation of its economy. Emphasis is rather put on creating an enabling environment for digital innovation, including the necessary infrastructure and skills.

[5] Digital Transformation Scoreboard 2018.

5 Digital Public Services

5 Digital Public Services	Estonia		Cluster	EU
	rank	score	score	score
DESI 2018	**2**	**78.1**	**63.0**	**57.5**
DESI 2017	1	77.4	60.2	53.7

	Estonia				EU
	DESI 2018		DESI 2017		DESI 2018
	value	rank	value	rank	value
5a1 eGovernment Users[6] % internet users needing to submit forms	**96%** ↑ 2017	**1**	**93%** 2016	**1**	**58%** 2017
5a2 Pre-filled Forms Score (0 to 100)	**88** ↓ 2017	**2**	**89** 2016	**2**	**53** 2017
5a3 Online Service Completion Score (0 to 100)	**96** ↓ 2017	**3**	**97** 2016	**2**	**84** 2017
5a4 Digital Public Services for Businesses Score (0 to 100) — including domestic and cross-border	**93** → 2017	**5**	**93** 2016	**5**	**83** 2017
5a5 Open Data % of maximum score	**58%** ↑ 2017	**23**	**55%** 2016	**17**	**73%** 2017
5b1 eHealth Services % individuals	**49%** 2017	**1**	**NA**		**18%**

Estonia has for years been at the forefront of the online provision of public services, and this remains the dimension in which the country is performing best. Estonia progressed over the last year but slipped one rank. The share of eGovernment users (96 %) is the highest in Europe (double the EU average) and the country is among the top five when it comes to using pre-filled forms, online service completion and the range of digital services available for business. The availability of open data stands at 58 % and even more could be made available.

The country is also leading in eHealth services. Each person in Estonia who has visited a doctor has an online eHealth record that can be tracked through a central system (see box). Indeed 95 % of the health data are digitised, 99 % of prescriptions are digital as is 100 % of billing. The e-Prescription system draws on data from the national health insurance fund, meaning that if the patient is entitled to any state medical subsidies, the medicine is discounted accordingly. Moreover, people no longer need to visit a doctor or hospital for repeat prescriptions.

The success in making public services available online is mainly based on the widespread use of electronic identification cards and the creation of a digital information infrastructure, the X-Road, on which a secure internet data exchange layer allows decentralised databases

[6] The definition of this indicator has been changed. The new indicator measures eGovernment users as a percentage of those internet users needing to submit forms to the public administration.

and information systems to communicate with each other. X-Road parties share information to produce services that people can access with their e-ID[7].

The flexibility provided by this open set-up has allowed new components to be added over the years. The system is fed with information from both the public (i.e. population register, health insurance register, vehicle register, etc.) and the private sector (mainly energy, telecom and banks) and allows Estonians to use services including e-voting, online tax returns , online medical prescriptions, but also to sign a binding contract or open a bank account via a mobile phone from anywhere in the world.

On top of the easy availability of the services, the process implies efficiency improvements that allow users and public officials to make large gains in terms of money and time saved. For example, filing a tax declaration takes on average 5 minutes and a refund is issued within 5 days (compared to 3 to 6 months for a declaration on paper).

A recent paper by the World Bank quantified the time savings coming from the adoption of the X-Road as an impressive 2.8 million total hours for 2014, or 3 225 years. In other words, the productivity gain from eGovernment services is equivalent to 3 225 people working 24/7 for a whole year[8].

Highlight 2018: Estonian eHealth record

The Electronic Health Record (eHealth Record) is a nationwide system integrating data from Estonia's different healthcare providers to create a common record that every patient can access online. It works similarly to a centralised, national database that retrieves data as necessary from various providers, who may be using different systems, and presents it in a standard format via the e-Patient portal. Through the record, a doctor can easily access a patient's records from a single electronic file, and read test results, including image files such as X-rays.

To ensure the integrity of retrieved electronic medical records as well as system access logs, blockchain technology is used.

The system compiles data for national statistics that are used to measure health trends, track epidemics, or review how health resources are being spent.

Patients have access to their own records, as well as those of their children. By logging into the e-Patient portal with an electronic ID-card, the patient can review doctor visits and current prescriptions, and check which doctors have had access to their files.

Currently, 97 % of the patients have a digital record and the system receives 300 000 patient queries a year.

[7] Since 2015 Estonia and Finland have developed a joint data exchange platform based on Estonia's X-Road. It allows databases in both countries to interface, assist with cross-border services, and make e-services accessible to Estonian and Finnish citizens.

[8] See WB (2016) *Estonian e-Government Ecosystem: Foundation, Applications, Outcomes,* background paper to the world development repost 2016: Digital dividends.