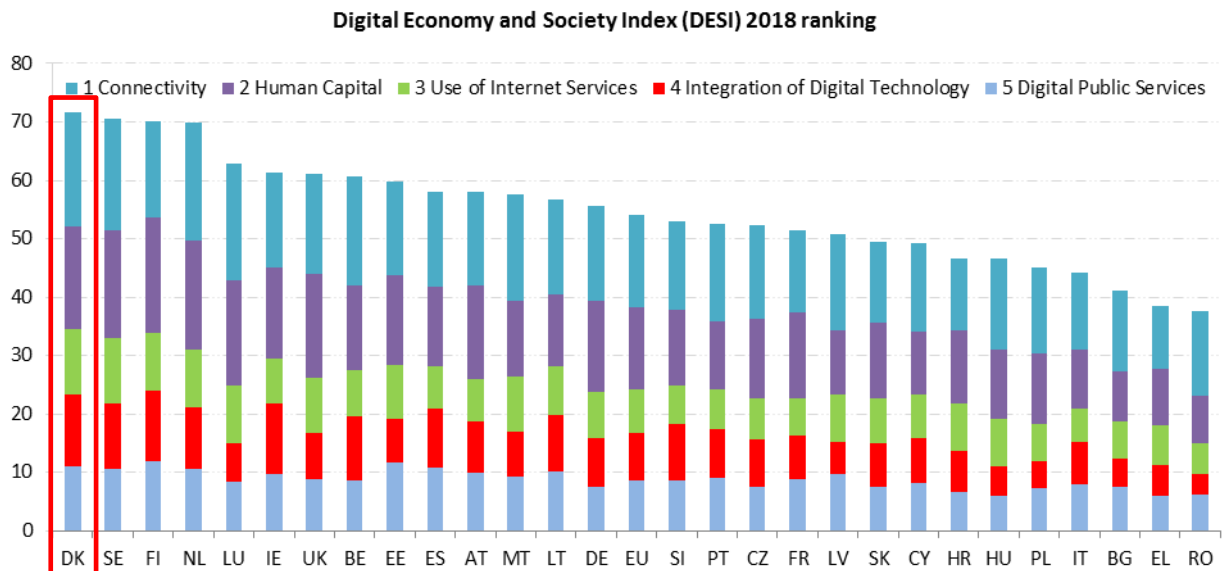# Digital Economy and Society Index (DESI)[1] 2018 Country Report Denmark

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.


Digital Economy and Society Index (DESI) 2018 ranking

	Denmark		Cluster	EU
	rank	score	score	score
DESI 2018	**1**	**73.7**	**63.8**	**53.3**
DESI 2017	1	72.1	61.1	50.2

Denmark ranks 1st out of the 28 EU Member States in DESI 2018. Denmark made progress in most dimensions, with the exception of Integration of Digital Technology. As a leader in digitisation, Denmark performed very well in connectivity, thanks to the widest 4G coverage in Europe, and the increase in coverage and take-up of fast and ultrafast fixed broadband connections. Almost all Danes are online and they make good use of a variety of online services, particularly for banking, shopping and accessing online entertainment. The percentage of ICT specialists is slowly increasing and a high percentage of Danes have at least basic digital skills. However, some gaps still exist: more than a quarter of Danes do not have basic digital skills. Denmark also made outstanding progress in the use of digital technologies by enterprises, leading the EU and the world rankings. However, some indicators show areas for potential improvement. Denmark is strong in the delivery of online public services thanks to a consistent long-term national strategy.

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

In January 2018, following the political agreement between the Danish People's Party and the Danish Social-Liberal Party, the Danish government launched a new digital strategy, Strategy for Denmark's Digital Growth[3], which consists of 38 initiatives, structured under seven main pillars[4]. The strategy aims at bringing Denmark to the forefront of the digital development, to create the best foundation for Danish companies and exploit new sources of digital growth. The ministry in charge of this strategy is the Ministry of Industry, Business, and Financial Affairs. It allocates DKK 1 bn (approximately EUR 134 million) for initiatives running from 2018 to 2025. Several of the initiatives will be based on private funding.

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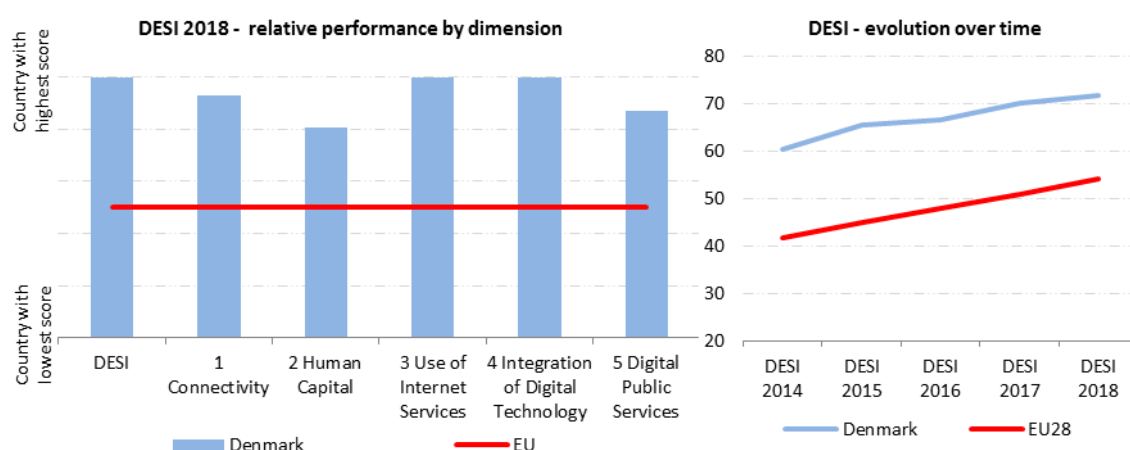
[2] High-performing countries are Denmark, Sweden, Finland, the Netherlands, Luxembourg, Ireland, the UK, Belgium and Estonia.
[3] https://em.dk/nyheder/2018/01-30-ny-strategi-skal-gore-danmark-til-digital-frontlober
[4] The seven pillars are: (i) Digital Hub Denmark; (ii) SME:Digital; (iii) The Technology Pact; (iv) Strengthened Computational Thinking in Elementary School; (v) Data as a Driver of Growth; (vi) Agile Regulation for New Business Models; and (vii) Strengthened Cyber Security in Companies.

1 Connectivity

1 Connectivity	Denmark		Cluster	EU
	rank	score	score	score
DESI 2018	**3**	**78.5**	**71.9**	**62.6**
DESI 2017	3	74.5	67.9	58.5

	Denmark					EU
	DESI 2018			DESI 2017		DESI 2018
	value		rank	value	rank	value
1a1 Fixed Broadband Coverage	>99.5% ↑		9	99%	9	97%
% households	2017			2016		2017
1a2 Fixed Broadband Take-up	86% ↑		5	83%	5	75%
% households	2017			2016		2017
1b1 4G Coverage	100% →		1	100%	1	91%
% households (average of operators)	2017			2016		2017
1b2 Mobile Broadband Take-up	129 ↑		3	120	2	90
Subscriptions per 100 people	2017			2016		2017
1c1 Fast Broadband (NGA) Coverage	95% ↑		5	93%	6	80%
% households covered by VDSL, FTTP or Docsis 3.0	2017			2016		2017
1c2 Fast Broadband Take-up	52% ↑		7	41%	8	33%
% homes subscribing to >= 30Mbps	2017			2016		2017
1d1 Ultrafast Broadband Coverage	86%		7	NA		58%
% households covered by FTTP or Docsis 3.0	2017					2017
1d2 Ultrafast Broadband Take-up	18.5% ↑		10	10.7%	14	15.4%
% homes subscribing to >= 100Mbps	2017			2016		2017
1e1 Broadband Price Index	89 →		7	89	9	87
Score (0 to 100)	2017			2016		2017

Denmark is a leader in Connectivity and has improved its score in line with the improved score of the high-performing cluster. 4G and next-generation (NGA) coverage and mobile and fixed broadband take-up are among the best in the EU (100 % and 95 %, respectively). Ultrafast broadband coverage (85.9 %) is also well above the EU-average (58 %). On rural NGA coverage, the situation has improved, but with 66 % coverage these remote areas are still lagging considerably behind total NGA coverage which stands at 95 %. In ultrafast broadband, there has been a sharp increase in take-up which increased from 10.7% in the previous year to 18.5% in 2017. However, there are still more than two thirds of Danish households that could access ultrafast broadband, but choose not to subscribe.

To meet its targets for high-speed broadband access, the government has committed itself to improving network quality in rural areas. It aims to ensure full high-speed coverage of 100 Mbps download and 30 Mbps upload speeds by 2020. Although network quality is high for the country as a whole, fixed network quality is lower in rural areas. Denmark allocated DKK 200 million (approximately EUR 27 million) of public funds to a small broadband fund. The fund was increased by DKK 60 million in 2017. Since 2016 a tax deduction has been available for the labour cost connected for upgrades or installations of broadband connections. The limited role of both national and EU funding in broadband deployment reflects an overwhelming reliance on private investment, facilitated by regional and local

organisations. Some of the operators are performing 5G trials, and they have achieved significantly high data rates. The Innovation Fund Denmark has allocated funds to several major 5G projects involving universities, industry and operators.

In order to further improve its connectivity ratings and achieve its ambitions to ensure fast broadband is available everywhere, an improvement in both take-up of higher speed products and coverage for rural NGA wireline networks would be desirable. As Denmark overwhelmingly relies on private investment, more clarity on the issue of access to fibre networks could help investors to assess potential benefits and risks more reliably. Additional demand-side evolution may be further stimulated by enhancing the transparency and comparability of electronic communication service offers to end users, mainly in terms of contractual information.

2 Human Capital

2 Human Capital	Denmark		Cluster	EU
	rank	score	score	score
DESI 2018	**6**	**70.4**	**70.7**	**56.5**
DESI 2017	6	69.0	69.4	54.6

	Denmark					EU
	DESI 2018			DESI 2017		DESI 2018
	value		rank	value	rank	value
2a1 Internet Users	**95%**	↑	**2**	**94%**	**2**	**81%**
% individuals	2017			2016		2017
2a2 At Least Basic Digital Skills	**71%**	↓	**5**	**78%**	**2**	**57%**
% individuals	2017			2016		2017
2b1 ICT Specialists	**4.2%**	↑	**6**	**3.9%**	**9**	**3.7%**
% total employment	2016			2015		2016
2b2 STEM Graduates[5]	**23.3**	↑	**3**	**20.8**	**8**	**19.1**
Per 1000 individuals (aged 20-29)	2016			2014		2015

In the Human Capital dimension, Denmark is performing very well and making progress in particular in its percentage of STEM – science, technology, engineering and maths - graduates. Almost all Danes are regular users of the internet (95 %). In 2017, 71 % of Danes reported having at least basic digital skills, well above the EU average of 57 %. 51 % of Danes between 55 and 74 years old are also digitally skilled, which is much higher than in the rest of the EU (34 %). The increasing in the share of ICT specialists places Denmark well above the EU average. The share of tertiary graduates with STEM qualifications improved substantially compared to the previous year. The Danish government views ICT specialists and new STEM graduates as important for fostering digital and technology-driven growth and innovation in companies.

A key priority for Denmark is thus to create a better match between the digital skills required by companies and the supply graduates with these skills. The new Strategy for Denmark's Digital Growth (*Strategi for Danmarks digitale vækst*) includes action areas related to digital skills: one action area relies on the Danish Technology Pact while another focuses on computational thinking in elementary school.

The Technology Pact was set up by the government in cooperation with, inter alia, business, educational institutions and public actors. Its goalis to improve people's skills to prepare them for a digital future. The Technology Pact intends to attract more students to STEM-field degrees to meet the needs of business, create innovation, and boost new business models, thereby increasing growth. A total of DKK 15 million (approximately EUR 2 million) in 2018 and an annual amount of DKK 20 million (approximately EUR 2.7 million) between 2019 and 2022 have been budgeted for the Technology Pact.

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[5] 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.

The government, together with the Technology Pact Council, will outline the strategic direction needed to take the initiative further. In addition, an advisory body consisting of institutions and large companies, is being set up. It will actively help develop new initiatives, increase visibility and arrange networking activities. All companies, educational institutions and other relevant actors are encouraged to engage in the Technology Pact, for example by participating in efforts to inspire young people and develop skills for future digital jobs. Additionally, the government will initiate a project of DKK 43.4 million (approximately EUR 5.8 million) under the National Fund of Structural Funds to better coordinate digital education and training across the business, education and employment systems. Furthermore, the government has drawn up a national science strategy for primary, secondary and university education that emphasises cooperation with the private sector. The strategy is a follow-up to the upper secondary school reform, which came into force in 2017.

On teaching computational skills in elementary school, the government will introduce a four-year trial programme, which will test different models for how technology understanding can be strengthened in primary and lower secondary schools. A total of DKK 10 million (approximately EUR 1.34 million) for the trial in 2018 and an annual budget of DKK 58 million (approximately EUR 7.8 million) for the period 2019 – 2021 have been allocated.

Furthermore, the October 2017 agreement between the government and social partners on adult education and vocational training is also expected to stimulate digital skills training. The new Danish Committee on University Education also aims to ensure that education addresses digital learning needs.

All Danes should be able to reap the benefits of the digital transformation. Addressing the rising demand for digital skills and reversing the stagnating availability of ICT specialists remains crucial for supporting the digital transformation of the Danish economy.

3 Use of Internet Services

3 Use of Internet Services	Denmark		Cluster	EU
	rank	score	score	score
DESI 2018	**1**	**75.1**	**63.4**	**50.5**
DESI 2017	1	73.9	60.5	47.5

	Denmark				EU
	DESI 2018		DESI 2017		DESI 2018
	value	rank	value	rank	value
3a1 News	**86%**	**9**	**NA**		**72%**
% individuals who used Internet in the last 3 months	2017		2016		2017
3a2 Music, Videos and Games	**90%**	**3**	**90%**	**3**	**78%**
% individuals who used Internet in the last 3 months	2016		2016		2016
3a3 Video on Demand	**49%**	**1**	**49%**	**1**	**21%**
% individuals who used Internet in the last 3 months	2016		2016		2016
3b1 Video Calls	**62%** ↑	**5**	**60%**	**4**	**46%**
% individuals who used Internet in the last 3 months	2017		2016		2017
3b2 Social Networks	**78%** ↑	**7**	**77%**	**5**	**65%**
% individuals who used Internet in the last 3 months	2017		2016		2017
3c1 Banking	**92%** ↑	**3**	**91%**	**3**	**61%**
% individuals who used Internet in the last 3 months	2017		2016		2017
3c2 Shopping	**82%** ↓	**3**	**84%**	**2**	**68%**
% individuals who used Internet in the last 12 months	2017		2016		2017

Denmark ranks 1st in the share of its population using Internet services. Danish internet users are well above in reading news online (86 % of Danes), listening to music online, watching videos online and playing games online (90 %). They are also eager users of online video calls with 62 % of Danes making online video calls. They rank first in Europe for use of Video on Demand services (49 %). They are heavy users of social networks (78 %). The use of online banking (92 %) and online shopping (82 %) are well above the levels for the rest of the EU. This shows a high level of trust in online activities.

4 Integration of Digital Technology

4 Integration of Digital Technology	Denmark		Cluster	EU
	rank	score	score	score
DESI 2018	**1**	**61.3**	**47.0**	**40.1**
DESI 2017	1	62.4	44.0	36.7

	Denmark					EU
	DESI 2018			DESI 2017		DESI 2018
	value		rank	value	rank	value
4a1 Electronic Information Sharing	**40%**	↓	**6**	**47%**	**2**	**34%**
% enterprises	2017			2015		2017
4a2 RFID	**2.0%**	↓	**26**	**3.2%**	**17**	**4.2%**
% enterprises	2017			2014		2017
4a3 Social Media	**29%**	↑	**5**	**27%**	**6**	**21%**
% enterprises	2017			2016		2017
4a4 eInvoices	**NA**			**64.0%**	**2**	**NA**
% enterprises	2017			2016		2017
4a5 Cloud	**37.7%**	↑	**3**	**29.6%**	**3**	**NA**
% enterprises	2017			2016		2017
4b1 SMEs Selling Online	**27.8%**	↑	**3**	**27.0%**	**2**	**17.2%**
% SMEs	2017			2016		2017
4b2 E-commerce Turnover	**14.5%**	↓	**5**	**18.0%**	**4**	**10.3%**
% SME turnover	2017			2016		2017
4b3 Selling Online Cross-border	**9.2%**	↓	**11**	**9.8%**	**8**	**8.4%**
% SMEs	2017			2015		2017

Over the last year, Denmark made progress in the Integration of Digital Technology by businesses dimension, leading the EU ranking. Danish enterprises took advantage of the possibilities offered by online commerce: 28 % of SMEs sell online, well above the 17 % EU average. 10 % of SMEs sold cross-border during the year and the percentage of their revenues coming from e-commerce was high (14.5 %). A large number of Danish enterprises embraced digital technologies, such as cloud (38 %) and social media (29 %) while making good use of electronic information sharing technologies (40 %).

Denmark placed SMEs and innovation at the forefront of their Strategy for Denmark's Digital Growth (*Strategi for Danmarks digitale vækst*) which has seven pillars. First, the pillar on Digital Hub Denmark aims to accelerate the use of new digital technologies within Danish firms by matching firms and digital frontrunners (companies that heavily use digital technologies) through a digital platform. Moreover, Digital Hub Denmark will focus on how firms can benefit from new business models linked to digital technologies The Danish government has assigned DKK 20 million (approximately EUR 2.7 million) to the creation of Digital Hub Denmark in 2018 and an annual amount of DKK 25 million (approximately EUR 3.4 million) for the period 2019–2021. Second, under the pillar called SME:Digital, the government wants to provide targeted digitisation support to small and medium sized enterprises. Examples of concrete support activities include (i) the preparation of business cases for digital conversion, (ii) exploring opportunities for e-commerce and e-exports through an e-commerce centre, (iii) strengthening business leaders' skills and (iv) giving

advice on digital design. A budget of DKK 10 million (approximately EUR 1.34 million) in 2018 and annual DKK 20 million (approximately EUR 2.7 million) for this pillar for the period 2019-2021 is planned.

Digital trust is a requisite for digital growth. Based on recommmendations from the Business Council for Cybersecurity, the Danish government will strengthen cyber security by establishing an information portal and a digital interface for companies to report cyber security incidents and safety breaches of personal data.

The collaborative economy is also part of this new strategy. Under the pillar Agile Regulation for New Business Models, the government has launched an online portal[6], where users and companies can clarify the rules that affect them in this new business concept.

Denmark's policies have succeeded in delivering an environment for businesses and SMEs to flourish. However, in order to further advance the digital transformation of the economy, it will be important to keep focusing on the advantages of digitisation and ensure strong commitment from actors throughout the digital value chain.

Highlight 2018: World's first blockchain solution for ship registrations

Denmark will become the first country in the world to apply blockchain technology for processing ship registrations. This is one of the concrete initiatives under the pillar *Data as a growth driver in business* of the newly launched Denmark's Digital Growth Strategy (*Strategi for Danmarks digitale vækst).* The ship registration process is currently analogue and extremely resource-intensive. Applying blockchain technology for ship registrations sets the basis for an effective and cost-saving system. This will enable companies to access data, including registration type and number of application, which was not possible before. The digital blockchain solution will also provide authorities with a record of useful data for planning and control purposes. The Maritime Authority will soon implement the new digital ship register in the near future. A total budget of DKK 32 million (approximately EUR 4.3 million) for the period 2019-2023 has been allocated for this project.

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[6] https://deleoekonomien.dk/

5 Digital Public Services

5 Digital Public Services	Denmark		Cluster	EU
	rank	score	score	score
DESI 2018	**3**	**73.2**	**63.0**	**57.5**
DESI 2017	3	71.3	60.2	53.7

	Denmark					EU
	DESI 2018			DESI 2017		DESI 2018
	value		rank	value	rank	value
5a1 eGovernment Users[7]	86% ↓		4	89%	3	58%
% internet users needing to submit forms	2017			2016		2017
5a2 Pre-filled Forms	71 →		10	71	7	53
Score (0 to 100)	2017			2016		2017
5a3 Online Service Completion	94 ↓		6	95	5	84
Score (0 to 100)	2017			2016		2017
5a4 Digital Public Services for Businesses	100 →		1	100	1	83
Score (0 to 100) - including domestic and cross-border	2017			2016		2017
5a5 Open Data	58% ↑		24	41%	24	73%
% of maximum score	2017			2016		2017
5b1 eHealth Services	42%		3	NA		18%
% individuals	2017					

On digital public services, Denmark performs very well. The country is a frontrunner in the the delivery of digital public services among EU countries with a score of 73.2, two points more than last year. Denmark scores the highest (100 points) in availability of domestic and cross-border online public services for businesses. The country has also largely succeeded in shifting citizens to digital channels: 86 % of internet users that must submit forms do so online. In terms of open data, Denmark continued to make considerable progress over the last year (after launching the new platform). Thanks to a high score in their completeness of online services (94 out of 100), Denmark provides a good and user-friendly framework for eGovernment service for its citizens. On eHealth Services, Denmark is performing well and ranks third among EU Member States when it comes to people who used these services online without having to go to the hospital or doctors surgery (for example, by getting a prescription or a consultation online).

In 2016, Denmark successfully launched its eGovernment strategy — known as The Digital Strategy 2016-2020[8] — which aims to strengthen Denmark's worldwide leading position on public service digitisation. This strategy aims to tackle remaining issues such as user-friendlier life-events. The number of services that are exempt from the requirement that they be made 'digital by default' is falling. Exemptions from digital-by-default legislation of mandatory use of online services and digital post have steadily fallen to 9.1 % and 90.6 % are now registered citizens of 15 years of age and above.

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[7] 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.

[8] http://www.digst.dk/Strategier/Strategi-2016-2020

Digital administration has helped to minimise the administrative burden. It is therefore easier to start and run a business in Denmark because there is less bureaucracy in the start-up and operational phases. The registration process for companies is fully digitalised.

On eHealth, Denmark has a strong infrastructure. The country ranks first for general practitioners using electronic health records and fourth in terms of eHealth records in hospitals[9] in the EU. It also has a well-established set of disease registries. The eGovernment national strategy places eHealth services at the core, targeting public digital services available and customised to all Danes.

Having a consistent and long-term national strategy in eGovernment where digital welfare and *life-event journey* principle are at its core is of the utmost importance. Further improving the quality of eGovernment services, such as increasing accessibility, will depend on exploring the usability of smart technologies in new use cases.

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[9] OECD/European Observatory on Health Systems and Policies, 2017