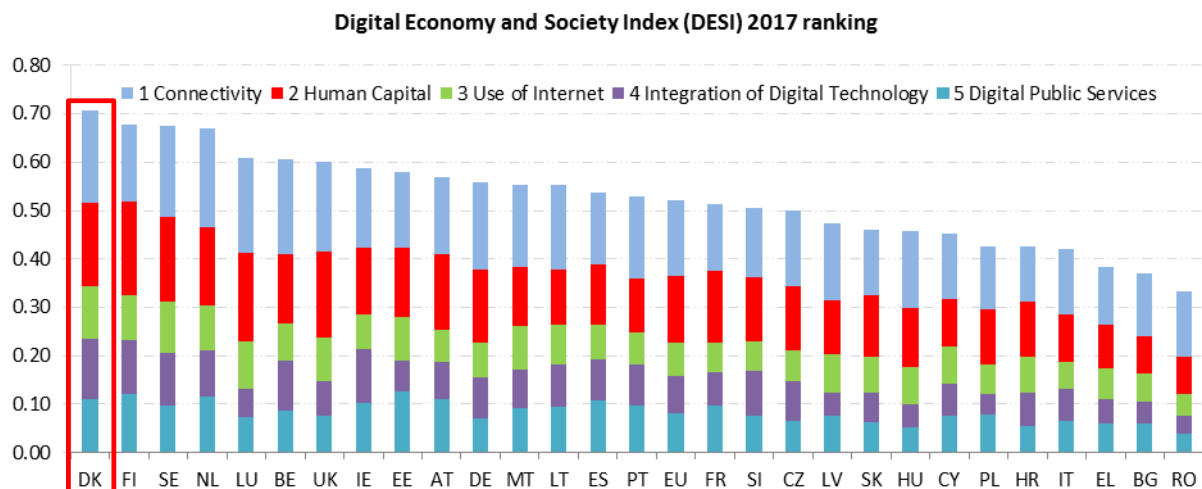


Europe's Digital Progress Report (EDPR) 2017 Country Profile Denmark

Europe's Digital Progress Report (EDPR) tracks the progress made by Member States in terms of their digitisation, combining quantitative evidence from the Digital Economy and Society Index (DESI)¹ with qualitative information on country-specific policies. It is structured around five chapters:

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



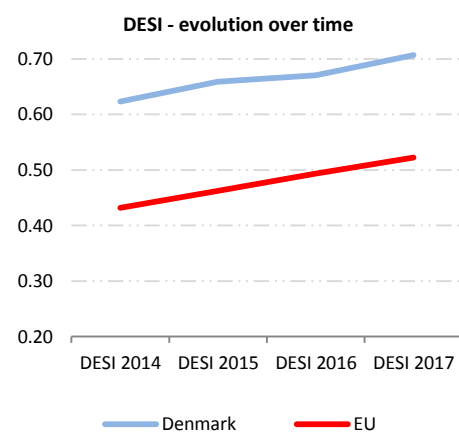
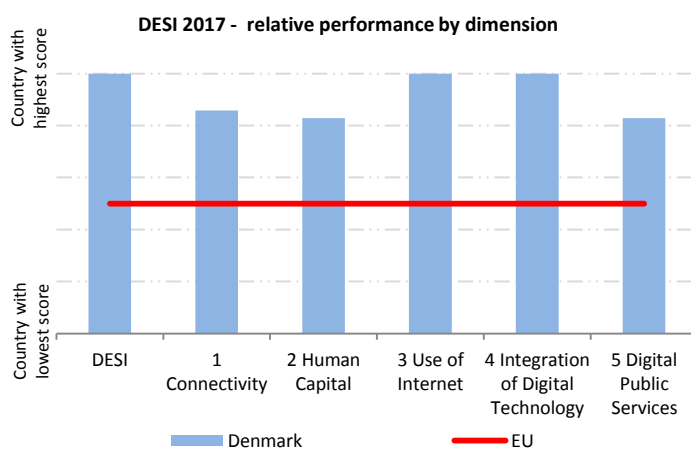
¹ <https://ec.europa.eu/digital-single-market/en/desi>

	Denmark		Cluster	EU
	rank	score	score	score
DESI 2017	1	0.71	0.63	0.52
DESI 2016 ²	1	0.67	0.60	0.49

Denmark ranks 1st out of the 28 EU Member States and it progressed at a higher pace than the EU average. Denmark made progress in most dimensions. Denmark performed very well on Connectivity, thanks to the widest 4G coverage in Europe and the increase in take-up of fast connections. 94% of Danish citizens are online and the vast majority have at least basic digital skills. However, the share of ICT specialists stagnated. On the supply side, Denmark made outstanding progress in the use of digital technologies by enterprises, leading the EU and the world rankings. 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.³

Denmark is a world leader in digitisation and the new umbrella governmental digital plan, namely, Digital Strategy 2016-2020⁴, presented in May 2016, aims at further enhancing close public sector collaboration to deliver good, efficient and coherent services to the public and businesses.⁵



² The DESI 2017 was re-calculated 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>.

³ High performing countries are Denmark, Finland, Sweden, the Netherlands, Belgium, the UK, Ireland, Luxembourg and Estonia.

⁴ <http://www.digst.dk/ServiceMenu/English/Policy-and-Strategy/Digital-Strategy-2016to2020>

⁵ Due to its maturity, there are several national strategies dealing with different aspects of digitisation (inter alia, National Broadband Plan, National Investment plan for ICT and Digital Skills, Online Portal for companies –Virksomheder –, Industry 4.0. strategy).

1 Connectivity

1 Connectivity	Denmark		Cluster	EU
	rank	score	score	score
DESI 2017	4	0.76	0.75	0.63
DESI 2016	4	0.72	0.73	0.59

	Denmark				EU	
	DESI 2017 value		rank	DESI 2016 value	rank	DESI 2017 value
1a1 Fixed Broadband Coverage % households	99% 2016	→	11	99% 2015	12	98% 2016
1a2 Fixed Broadband Take-up % households	83% 2016	↑	5	77% 2015	8	74% 2016
1b1 Mobile Broadband Take-up Subscriptions per 100 people	123 June 2016	↑	2	112 June 2015	3	84 June 2016
1b2 4G coverage⁶ % households (average of operators)	100% 2016		1	NA		84% 2016
1b3 Spectrum⁷ % of the target	64% 2016	↓	19	68% 2015	17	68% 2016
1c1 NGA Coverage % households	93% 2016	↑	7	92% 2015	6	76% 2016
1c2 Subscriptions to Fast Broadband % subscriptions >= 30Mbps	49% June 2016	↑	13	42% June 2015	12	37% June 2016
1d1 Fixed Broadband Price⁸ % income	1.0% price 2016, income 2015	↓	5	0.9% price 2015, income 2015	6	1.2% price 2016, income 2015

Denmark is a leader in the Connectivity dimension and has improved its score at twice the cluster speed. While mobile connectivity coverage, take-up and price levels are among the best in the EU, developments in fixed connectivity are stagnant in terms of coverage and decreasing in terms of pricing. Notably in remote areas, the country is still facing coverage issues. While there has been some growth in fast broadband subscriptions, the level achieved does not yet correspond to the infrastructure generally available on either the fixed or the mobile side. While demand for fast broadband has increased, it has done so at a rate below the EU average.

The Danish government is committed to providing fast broadband (100 Mbps down, 30 Mbps up) to rural and urban areas alike by 2020. It supports this objective through a national broadband fund of DKK 200 million targeting areas with poor coverage. Municipalities play predominantly a facilitating role in network deployment without providing direct financial contributions. The government is leading negotiations on a cross-party political agreement

⁶ This is a new DESI indicator measuring the average coverage of telecom operators' 4G networks.

⁷ There is a decrease in most of the Member States due to the additional EU harmonisation of the 700 MHz band in April 2016.

⁸ Due to a slight methodological change, historical data was re-calculated.

for future telecommunications policy, intended to create a deployment-friendly framework of policy and regulation. Both industry and local government are involved in the negotiations.

In order to further improve its connectivity ratings and realise its ambitions of fast broadband everywhere, Denmark will need to improve both take-up of higher speed products and coverage in terms of NGA wireline networks, notably in underserved areas. On the network side, this development path will notably depend on the analysis of national broadband markets in 2017 and the investment incentives that this will create. Greater coordination of municipal administrative practices and exploitation of the opportunities offered by the transposed Cost Reduction Directive can further support these. Additional demand-side evolution may, beyond the national broadband coverage mapping, be aided by enhancing the comparability of offers in terms of pricing and contractual information.

2 Human Capital

2 Human Capital	Denmark		Cluster	EU
	rank	score	score	score
DESI 2017	5	0.69	0.68	0.55
DESI 2016	5	0.67	0.66	0.53

	Denmark				EU	
	DESI 2017		DESI 2016		DESI 2017	
	value	rank	value	rank	value	
2a1 Internet Users	94%	↑	2	93%	2	79%
% individuals	2016		2015		2016	
2a2 At Least Basic Digital Skills	78%	↑	2	75%	2	56%
% individuals	2016		2015		2016	
2b1 ICT Specialists⁹	3.9%	→	9	3.9%	8	3.5%
% employed individuals	2015		2014		2015	
2b2 STEM Graduates	21	↑	6	20	8	19
Per 1000 individuals (aged 20-29)	2014		2013		2014	

In the Human Capital dimension, Denmark is performing very well and making progress in particular regarding basic digital skills. Almost all Danish citizens are regular users of the Internet (94%). In 2016, 78 % of Danes reported having at least basic digital skills, well above the EU average of 56%. Indeed, 50% of Danish citizens who are above 65 years old are also digitally skilled, which is much higher than in the rest of the EU. However, the share of ICT specialists has been steady over the last few years and Denmark has lost ranking. While the figure of 3.9% of the workforce is above the EU average, its growth is particularly relevant in order to foster the capacity of the Danish economy to further innovate and grow.

A key priority for Denmark is to ensure a better match between the digital skills required by companies and the supply thereof¹⁰. In the spring of 2016 the Danish Business Authority together with the Ministry of Education and the Ministry of Higher Education and Science launched a national mapping exercise of companies' need for digital skills¹¹. They found that in 2030, Danish companies will confront a deficit of 19,000 employees with digital skills.¹² Close to a third of the companies asked in the mapping were having problem recruiting digital skills and because of that half of those have lost orders. The mapping also looked closer at what kind of digital skills are scarce now and going forward. Construction skills with regards to programming and software development were the most sought after. The mapping also looked not only at ICT specialists but also at advanced users. This mapping exercise also found a lack of skills and a growing demand mostly in the area of product and service creation.

⁹ Historical data have been revised by Eurostat.

¹⁰ "Redegørelse om Danmarks digitale vækst". Danish Business Authority, May 2016 - <https://erhvervsstyrelsen.dk/redegoerelse-danmarks-digitale-vaekst-2016>

¹¹ <https://erhvervsstyrelsen.dk/kortlaegning-af-virksomhedernes-behov-digitale-kompetencer-0>

¹² The report used register-based data and job postings to map the needs for digital skills.

A similar mapping exercise of companies' needs for digital skills but at regional level has been by the Danish Growth Council (advisory body to the government on the growth policy) on growth policy¹³. Combining data from job postings and the Central Business Register the mapping contributes with new knowledge about which type of companies are demanding digital skills looking at industry codes, geography etc. The mapping has shown demand variations across the five regions for digital skills, linked to the business structure of the region. Moreover the mapping shows that the demand for digital skills increases across sectors, but mostly in regions with big cities and in sectors as information and communication and Finance. Also, two previous mapping activities targeted business needs and research and education in the field of cybersecurity,¹⁴ and future needs for digital skills.

Additionally, an investment of DKK 500 Million, approximately EUR 67 million, has been allocated in a National Investment Plan for ICT and Digital Skills.¹⁵ This is a 5 year project launched in 2012 with a focus in four particular areas, namely (a) develop the market for digital learning resources; (b) gain more knowledge on ICT-based learning; (c) ensure efficient infrastructure in schools and support the use of ICT and digital learning resources through networking; and (d) collaboration and knowledge sharing between teachers. Danish municipalities are co-funding the strategy with an equivalent amount. The vast majority of the money is spent to support the municipalities' purchase of digital learning resources by giving government grants for the purchase of digital learning resources that meet certain criteria.

As regards re-skilling the workforce, the Ministry of Higher Education and Science launched an initiative for the period 2015- 2020, for continuing higher education for the vocationally-trained, involving a budget of DKK 1 Billion, with an estimate of 180,000 citizens foreseen to receive courses and specific training.

Denmark does not yet have an overarching strategy for digital skills. Digital skills initiatives have mainly been shaped for individual policies. Addressing the stagnating availability of ICT specialists remains crucial for supporting the digital and innovative transformation of the Danish economy.

¹³ "Regional demand for digital skills" <http://danmarksvaekstraad.dk/tema/1093819>

¹⁴ [Survey of knowledge and training in cyber and information security at Danish educational and research institutions \(2015\)](#)

¹⁵ <http://www.uvm.dk/Uddannelser/Folkeskolen/Laering-og-laeringsmiljoe/It-i-undervisningen/Pulje-til-digitale-laeremidler>

3 Use of Internet

3 Use of Internet	Denmark		Cluster	EU
	rank	score	score	score
DESI 2017	1	0.72	0.60	0.48
DESI 2016	2	0.64	0.57	0.45

	Denmark				EU
	DESI 2017		DESI 2016		DESI 2017
	value	rank	value	rank	value
3a1 News % individuals who used Internet in the last 3 months	72% ↑ 2016	20	69% 2015	19	70% 2016
3a2 Music, Videos and Games¹⁶ % individuals who used Internet in the last 3 months	90% 2016	3	NA		78% 2016
3a3 Video on Demand¹⁷ % individuals who used Internet in the last 3 months	49% 2016	1	NA		21% 2016
3b1 Video Calls % individuals who used Internet in the last 3 months	60% ↑ 2016	4	46% 2015	9	39% 2016
3b2 Social Networks % individuals who used Internet in the last 3 months	77% ↑ 2016	5	67% 2015	13	63% 2016
3c1 Banking % individuals who used Internet in the last 3 months	91% ↑ 2016	3	88% 2015	4	59% 2016
3c2 Shopping % internet users (last year)	84% ↑ 2016	2	82% 2015	3	66% 2016

In terms of the propensity of individuals to use Internet services, Denmark made good progress over the last year and now ranks 1st. Danish Internet users read news online (72%), listen to music, watch videos and play games online (90%), watch films (49%), well above the EU average. They are the first in Europe regarding Video Calls over the Internet (60%). They are heavy users of social networks (77%). The use on online banking (91%) and the use Internet for online shopping (84%) are far ahead of the rest of Europeans citizens.

¹⁶ Break in series due to a change in the Eurostat survey.

¹⁷ Break in series due to a change of data source. New source is Eurostat.

4 Integration of Digital Technology

4 Integration of Digital Technology	Denmark		Cluster	EU
	rank	score	score	score
DESI 2017	1	0.62	0.44	0.37
DESI 2016	1	0.56	0.41	0.35

	Denmark				EU
	DESI 2017		DESI 2016		DESI 2017
	value	rank	value	rank	value
4a1 Electronic Information Sharing	47%	3	47%	3	36%
% enterprises	2015		2015		2015
4a2 RFID	3.2%	17	3.2%	17	3.9%
% enterprises	2014		2014		2014
4a3 Social Media	27% ↑	6	20%	9	20%
% enterprises	2016		2015		2016
4a4 eInvoices	64% ↑	2	59%	2	18%
% enterprises	2016		2015		2016
4a5 Cloud	30% ↑	3	27%	3	13%
% enterprises	2016		2015		2016
4b1 SMEs Selling Online	27% ↑	2	25%	3	17%
% SMEs	2016		2015		2016
4b2 eCommerce Turnover	18.0% ↑	4	15.1%	3	9.4%
% SME turnover	2016		2015		2016
4b3 Selling Online Cross-border	9.8%	8	9.8%	8	7.5%
% SMEs	2015		2015		2015

Denmark over the last year made good progress the Integration of Digital Technology by businesses dimension, leading the EU ranking. Danish enterprises took advantage of the possibilities offered by online commerce: 27% of SMEs sell online, above the 17% EU average. In particular big and micro companies are adapting well to the digital era, medium sized companies, 10-249 employees, are slow adopters and frequently lack a digitisation strategy. Danish firms are highly or very highly digitised (45%), twice the European average of around 22%.¹⁸

The Danish government has assigned EUR 5.6 million to a business partnership focusing on advanced manufacturing for SMEs, running from 2016 to 2019. The purpose of the partnership is to boost the level of automation and digitisation among the manufacturing SMEs in Denmark.¹⁹ The DBA²⁰ manages the business partnership, and its members include industry stakeholders and the Danish GTS Advanced Technology Group.²¹ Last year, a total of 134 manufacturing companies applied and 53 were selected. Moreover, the Danish government launched a partnership promoting digitisation and eCommerce of SMEs in retail and wholesale, involving the DBA, industry associations and different stakeholders. At the

¹⁸ Digital Intensity Index, European Commission.

¹⁹ As part of the business partnership, manufacturing companies can apply for funding to help analyse how they can implement automation and digital solutions into their production processes.

²⁰ Danish Business Authority

²¹ GTS Advanced Technology Group is a network of approved technical service providers.

end of 2016 the partnership presented recommendations on how the government can strengthen Danish eCommerce further.

Digital trust is a requisite for digital growth. Therefore the minister for industry, business and financial affairs established a business council for cybersecurity in the beginning of 2016. The purpose of the council was to give recommendation to the minister on how to raise the level of cybersecurity in SMEs, which they did in March 2017. The vision of the recommendations is that Danish businesses should be known as credible and desirable business partners with a high degree of cybersecurity.

Danish startups had significantly lower net job creation compared with other Member States and that is why the government started a scaling initiative in order to address the problem of slow growth. The Scale-up programme²² (called *Scale-up Denmark*) is supported by EUR 22 million.²³ It is currently the largest Scandinavian accelerator programme, and aims to foster accelerated growth among business by working with already established businesses. The target was to set up 10 hubs in Denmark to consolidate positions of strength in each of the regions²⁴.

In order to further improve the digital transformation of the economy, it will be important to continually raise awareness of the need for impartial consulting on industry 4.0 investment decisions. Therefore, the Danish Government has asked a Digital Growth panel consisting of 15 enterprise and business CEO's and experts for a comprehensive set of policy recommendations aimed at initiatives that can help unleash Denmark's digital potential. These recommendations will be a central input to the Danish government's forthcoming digital strategy which is to be published later in 2017. The strategy aims at placing Denmark in front when it comes to exploiting the opportunities offered by digitization and new technology.

²² www.scale-updenmark.com

²³ Half of the funding came from the five Danish regions and half from the EU (ERDF).

²⁴ For example, in Midtjylland one of the hubs is about "smart industry".

5 Digital Public Services

5 Digital Public Services	Denmark		Cluster	EU
	rank	score	score	score
DESI 2017	4	0.74	0.59	0.55
DESI 2016	3	0.76	0.57	0.51

	Denmark				EU
	DESI 2017		DESI 2016		DESI 2017
	value	rank	value	rank	value
5a1 eGovernment Users % internet users (last year)	73% ↑	2	71%	2	34%
	2016		2015		2016
5a2 Pre-filled Forms Score (0 to 100)	71 ↓	7	77	5	49
	2016		2015		2016
5a3 Online Service Completion Score (0 to 100)	95 ↑	5	94	5	82
	2016		2015		2016
5a4 Open Data²⁵ % of maximum score	41% ↓	24	49%	12	59%
	2016		2015		2016

Denmark is strong in the delivery of online public services and with a score of 0.74, Denmark ranks 4th among EU countries in Digital Public Services. The low score in Open Data is due to a transition phase towards a new eGovernment portal. Denmark has succeeded to a great extent in shifting citizens and businesses to public digital channels with 73% of Internet users returning filled forms online to the public authorities. In 2016, almost 90% of individuals needed to submit official forms to administrative authorities electronically, well above the EU average (56%).

Denmark has launched a new eGovernment strategy — known as The Digital Strategy 2016-2020²⁶ — which aims to strengthen Denmark's worldwide leading position on Public Service Digitisation and must provide good conditions for growth and reduce administrative burdens for businesses. It also aims to sustain an inclusive society in which everyone can participate, both the digitally ready, and those who do not know how to use digital solutions or who do not have access to them. On top of its ambitious goals,²⁷ specific themes have been selected for inclusion in the new strategy.²⁸

Denmark proved to have a consistent and long-term national strategy when it comes to eGovernment and the new Digital Strategy 2016-2020 aims to strengthen Denmark's worldwide leading position on Public Service Digitisation.

²⁵ Change of data source. The historical data have also been restated. The new source is the European Data Portal.

²⁶ <http://www.digst.dk/Strategier/Strategi-2016-2020>

²⁷ (a) a productive and efficient public sector; (b) public services must create value for the public and businesses; (c) public digitisation must support business growth.

²⁸ namely automation of public administrative procedures, better user experience for the public and businesses, digital welfare, data sharing and management of the joint public digitisation efforts, among others.

Highlight 2017:²⁹ Virk Portal³⁰

The Virk Portal is the digital communication portal for business with public authorities, offering self-service solutions, including:

- 1) more than 1,600 of solutions available at "Virk Indberet";
- 2) information and tools for start-up of new businesses, available at "Virk Startvækst";
- 3) business data –including the Danish business register, which is available on "Virk Data".
- 4) and customized information to each business on Virk, including digital post from public authorities

According to surveys around 96 % of Danish businesses know Virk. Virk also hosts a support function, where businesses can call to ask questions regarding digital communication with the public sector. The Danish Business Authority hosts this portal and also supports other authorities – primarily agencies from state level – in order to secure user-friendly solutions that fulfil publicly-recognised effectiveness requirements. Indeed, the registration process for companies is fully digitalised. More than 90 % of company types get a 'CVR' business registration number immediately.

In order to increase the usability of the digital solutions, it is a requirement that mandatory solutions should pass a standardized use-test before being released on Virk. However, Virk also recommends all public solutions (non-mandatory) to pass the test. The test is a tool to secure end-user efficiency.

²⁹ "Highlight 2016": "**Denmark's digital by default strategy**": The "digital by default" strategy was at the core of Denmark's eGovernment strategy 2011-2015, aiming for 80% of all service requests to be electronic by 2015 and 100% of business communications to be electronic by the end of 2012. All in all, by 2015, there were 91 mandatory digital self-services, which represented 80% of all services within the four waves.

³⁰ www.virk.dk