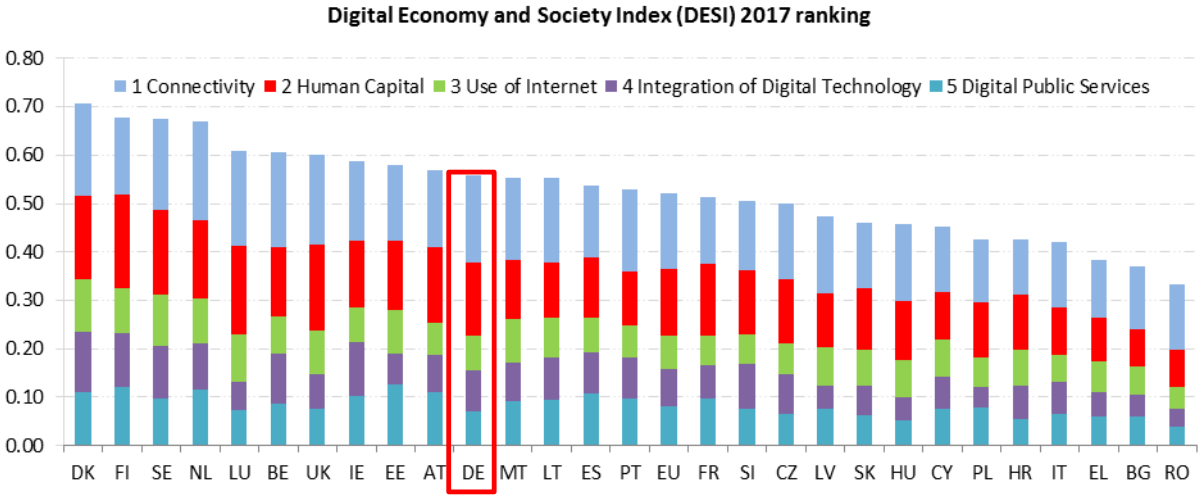
Europe's Digital Progress Report (EDPR) 2017 Country Profile Germany

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



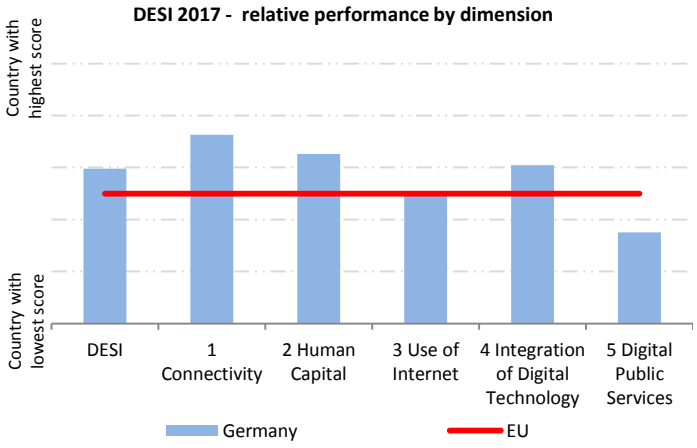
[1] https://ec.europa.eu/digital-single-market/en/desi

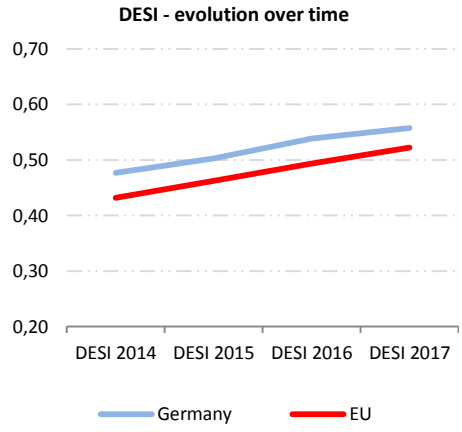
	Germany		Cluster	EU
	rank	score	score	score
DESI 2017	**11**	**0.56**	**0.54**	**0.52**
DESI 2016[2]	11	0.54	0.51	0.49

Germany ranks 11th out of the 28 EU Member States. Overall, it progressed slowly over the last year. Germany is leading regarding spectrum assignment, facilitating the development of advanced mobile technologies in rural areas. Germans have good digital skills (7th rank), although the potential of Germany's industry risks being hampered by a shortage of ICT professionals. German Internet users are very active online shoppers and German enterprises are exploiting the possibilities offered by the digital economy. In particular big and micro companies are adapting well to the digital era. The country's greatest challenge in digital is to improve the online interaction between public authorities and citizens. With only 19% of the population being eGovernment users, Germany ranks 23rd amongst the Member States. Yet there is still no coherent and nation-wide offer of eGovernment services.

Germany belongs to the Medium performing cluster of countries[3].

In 2014 Germany adopted its Digital Agenda 2014-2017[4] and in March 2016 the Federal Ministry for Economic Affairs and Energy presented the Digital Strategy 2025.[5]





[2] The DESI 2016 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] Medium performing countries are Latvia, Czech Republic, Slovenia, France, Portugal, Spain, Lithuania, Malta, Germany and Austria.

[4] http://www.bmwi.de/EN/Topics/Technology/digital-agenda.html

[5] https://www.bmwi.de/English/Redaktion/Pdf/ict-strategy-digital-germany-2015,property=pdf,bereich=bmwi2012,sprache=en,rwb=true.pdf

1 Connectivity

1 Connectivity	Germany		Cluster	EU
	rank	score	score	score
DESI 2017	**7**	**0.72**	**0.63**	**0.63**
DESI 2016	7	0.69	0.60	0.59

	Germany					EU
	DESI 2017			DESI 2016		DESI 2017
	value		rank	value	rank	value
1a1 Fixed Broadband Coverage % households	**99%** 2016	↑	**15**	**98%** 2015	**16**	**98%** 2016
1a2 Fixed Broadband Take-up % households	**86%** 2016	↑	**4**	**84%** 2015	**4**	**74%** 2016
1b1 Mobile Broadband Take-up Subscriptions per 100 people	**73** June 2016	↑	**21**	**66** June 2015	**17**	**84** June 2016
1b2 4G coverage[6] % households (average of operators)	**86%** 2016		**19**	**NA**		**84%** 2016
1b3 Spectrum[7] % of the target	**100%** 2016	→	**1**	**100%** 2015	**1**	**68%** 2016
1c1 NGA Coverage % households	**82%** 2016	↑	**12**	**81%** 2015	**12**	**76%** 2016
1c2 Subscriptions to Fast Broadband % subscriptions >= 30Mbps	**31%** June 2016	↑	**21**	**25%** June 2015	**21**	**37%** June 2016
1d1 Fixed Broadband Price[8] % income	**0.8%** price 2016, income 2015	→	**2**	**0.8%** price 2015, income 2015	**4**	**1.2%** price 2016, income 2015

Germany performs well and is making significant progress with a number of Connectivity indicators. Germany is fully covered by broadband services, including fixed, mobile and satellite networks. Although rural NGA coverage has improved significantly since last year, from 36% to 49%,[9] and is now well above the EU average (40%), the digital divide between urban and rural areas is still obvious. Germany is performing less well in the uptake of fast broadband services compared with the EU average (31% vs 37%). The price of fixed broadband compared with income, second lowest in the EU, was stable over the last two years.

Regarding spectrum, Germany is the only Member State in the EU that has assigned 100% of the overall harmonised spectrum for broadband. Germany achieved a slightly better 4G coverage than the EU average, 86% versus 84%. Already at the end of 2014, LTE with a

[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.

[9] Source: Broadband Coverage Study (IHS and Point Topic). Data as of October 2015 and October 2016.

download speed of more than 2 Mbps was available to 92.1 % of German households. However, mobile broadband take-up is lower than elsewhere in the EU, 73 subscriptions versus 84 per 100 inhabitants (EU average).

According to the 2014 "Digital Agenda 2014-2017", the German government's aim is to provide fast broadband Internet of at least 50 Mbps nationwide to all households by 2018, through a variety of technologies. Nearshore vectoring[10] is expected to provide connection speeds above 50 Mbps to about 1.4 million households for the first time in Germany. Moreover, companies represented in the "Network Alliance for a Digital Germany" *Netzallianz Digitales Deutschland* have invested another 8 billion EUR in 2016 in broadband network deployment. The Federal Government has contributed 4 billion EUR with the broadband funding programme.

In order to achieve Germany's aims regarding the deployment of "gigabit networks", targeted investments in fibre infrastructure will be necessary, although broadband funding is provided on a technologically neutral basis. The cooperation of the Federal Government and the industry in this context is crucial. In November 2016 the Network Alliance together with BMVI set out the first cornerstones of a gigabit strategy in the document entitled *Eckpunkte Zukunftsoffensive Gigabit-Deutschland*[11], which directly supports such investments. In this document it is stated that the "massive roll-out of fibre" is essential. It is also recognised that investment in networks is favoured by high demand for gigabit connections. Therefore the plan is to spur demand from companies through an information campaign. Additionally it is foreseen that underserved industrial areas should be equipped solely with fibre connections[12]. Such measures could significantly contribute to the deployment of very high capacity networks in Germany.

[10] Use of vectoring in the areas within 550m of a local exchange.

[11] The strategy is divided in 4 phases until end 2025: Phase 1 until end 2018, Phase 2 until end 2019, Phase 3 until end 2020 and Phase 4 until end 2025. (Source: http://www.bmvi.de/SharedDocs/DE/Artikel/DG/eckpunkte-zukunftsoffensive-gigabit-deutschland.html.)

[12] As part of Phase 2 until end 2019.

2 Human Capital

2 Human Capital	Germany		Cluster	EU
	rank	score	score	score
DESI 2017	**8**	**0.61**	**0.57**	**0.55**
DESI 2016	8	0.59	0.55	0.53

	Germany					EU
	DESI 2017			DESI 2016		DESI 2017
	value		rank	value	rank	value
2a1 Internet Users % individuals	**87%** 2016	↑	**7**	**84%** 2015	**8**	**79%** 2016
2a2 At Least Basic Digital Skills % individuals	**68%** 2016	↑	**7**	**67%** 2015	**7**	**56%** 2016
2b1 ICT Specialists[13] % employed individuals	**3.7%** 2015	↑	**10**	**3.6%** 2014	**10**	**3.5%** 2015
2b2 STEM Graduates Per 1000 individuals (aged 20-29)	**19** 2014	↑	**11**	**17** 2013	**14**	**19** 2014

In the Human Capital dimension, Germany is performing well and making progress. The inhabitants of Germany are regular users of the Internet, and possess, on average, high digital skills. However, a significant number of schools do not have broadband access[14] and the use of computers by young Germans remains below the OECD average.[15] 3.7% of the workforce are ICT specialists but as in most European countries demand exceeds supply.

An element of the German Digital Agenda is the Digital Knowledge Society. A number of initiatives are underway: At *Länder* level, the Conference of Education Ministers (KMK) in December 2016 adopted the strategy on "Education in the digital world," comprising curricula for all school levels, teacher training, eGovernment etc.[16] The Federal Ministry for Education and Research (BMBF) presented its strategy "Education Offensive for the Digital Knowledge-based Society" in October 2016 and proposed a *DigitalPakt#D* with the *Länder*. The BMBF would invest EUR 5 billion over 5 years to provide 40 000 schools with all necessary digital equipment. In return the Länder would provide the teachers with the necessary training.

In cooperation with all of the stakeholders, the Federal Ministry of Economic Affairs and Energy continuously updates the curricula of the dual vocational training system to ensure that they keep up with the state-of-the-art in technology and with the requirements of a digitized economy.

Subjects relating to a digitised work environment have been discussed intensively within the "Work 4.0" dialogue process. In December 2016 the Federal Ministry of Labour and Social Affairs presented a "White Paper Work 4.0". As to the shortage of skilled IT personnel, the Federal Government pursues a cross-sectoral approach to safeguarding the future supply of

[13] Historical data have been revised by Eurostat.

[14] Bertelsmann Foundation (2016), *Monitor Digitale Bildung, Berufliche Ausbildung im digitalen Zeitalte*

[15] OECD (2016), PISA 2015 Results, Exellence and Equity in Education, Volume I.

[16] https://www.kmk.org/aktuelles/thema-2016-bildung-in-der-digitalen-welt.html

skilled personnel (*inter alia* through the skilled personnel concept, the partnership for skilled personnel and the skilled personnel offensive). Addressing the shortage of ICT specialists remains crucial to support digital transformation.

A national digital skills and jobs coalition could facilitate the building of synergies between different stakeholders for the design and implementation of strategies addressing the shortage of digitally skilled people.

3 Use of Internet

3 Use of Internet	Germany		Cluster	EU
	rank	score	score	score
DESI 2017	**18**	**0.47**	**0.45**	**0.48**
DESI 2016	15	0.45	0.42	0.45

	Germany				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		**19**	**72%** 2015	**16**	**70%** 2016
3a2 Music, Videos and Games[17] % individuals who used Internet in the last 3 months	**78%** 2016		**17**	**NA**		**78%** 2016
3a3 Video on Demand[18] % individuals who used Internet in the last 3 months	**23%** 2016		**11**	**NA**		**21%** 2016
3b1 Video Calls % individuals who used Internet in the last 3 months	**31%** → 2016		**27**	**31%** 2015	**25**	**39%** 2016
3b2 Social Networks % individuals who used Internet in the last 3 months	**56%** 2016		**25**	**NA** 2015		**63%** 2016
3c1 Banking % individuals who used Internet in the last 3 months	**59%** ↑ 2016		**16**	**58%** 2015	**16**	**59%** 2016
3c2 Shopping % internet users (last year)	**82%** → 2016		**3**	**82%** 2015	**2**	**66%** 2016

In terms of the propensity of individuals to use Internet services, Germany over the last year made little progress and fell back from rank 15 to rank 18. German Internet users read news online (72%), listen to music, watch videos and play games online (78%), watch films (23%) and make Video Calls over the Internet (31%). They use social networks (56%) and use online banking (59%). Users in Germany tend to use Internet for online shopping more than Europeans, 82% of Internet users compared to 66% for the EU28, rank third among the 28 Member States.

[17] Break in series due to a change in the Eurostat survey.

[18] Break in series due to a change of data source. New source is Eurostat.

4 Integration of Digital Technology

4 Integration of Digital Technology	Germany		Cluster	EU
	rank	score	score	score
DESI 2017	**10**	**0.43**	**0.40**	**0.37**
DESI 2016	7	0.42	0.37	0.35

	Germany				EU
	DESI 2017		DESI 2016		DESI 2017
	value	rank	value	rank	value
4a1 Electronic Information Sharing % enterprises	**56%** 2015	**1**	**56%** 2015	**1**	**36%** 2015
4a2 RFID % enterprises	**4.0%** 2014	**15**	**4.0%** 2014	**15**	**3.9%** 2014
4a3 Social Media % enterprises	**18%** ↑ 2016	**15**	**15%** 2015	**16**	**20%** 2016
4a4 eInvoices % enterprises	**16%** ↑ 2016	**13**	**14%** 2015	**13**	**18%** 2016
4a5 Cloud % enterprises	**9%** 2016	**21**	**NA** 2015		**13%** 2016
4b1 SMEs Selling Online % SMEs	**26%** ↑ 2016	**5**	**24%** 2015	**4**	**17%** 2016
4b2 eCommerce Turnover % SME turnover	**7.0%** ↓ 2016	**20**	**9.6%** 2015	**11**	**9.4%** 2016
4b3 Selling Online Cross-border % SMEs	**9.2%** 2015	**11**	**9.2%** 2015	**11**	**7.5%** 2015

Germany over the last year made little progress in the Integration of Digital Technology by businesses dimension. German enterprises are increasingly taking advantage of the possibilities offered by online commerce: 26% of SMEs sell online, above the 17% EU average. It appears that big and micro companies are adapting well to the digital era, but medium sized companies,10-249 employees, are slow adopters and frequently lack a digitisation strategy.[19] Also some sectors are lagging considerably behind in terms of digitisation, including in particular the health sector and certain manufacturing industries[20].

Strengthening and accelerating the digitisation of industry is a government priority, to help companies play a leading role in increasingly digitised and connected industrial production processes and value chains. The government has set up in particular the *Plattform Industrie 4.0*,[21] which involves all relevant actors, including business, social partners and education providers. The platform provides policy recommendations and practical guidance to support and accelerate technology adoption at company level. Smart Service World addresses the value chains that exist beyond the smart factory gates, and the related online services which

[19] Monitoring-Report Wirtschaft DIGITAL 2016, http://www.tns-infratest.com/WissensForum/Studien/monitoring-report_digitale_wirtschaft.asp

[20] Monitoring-Report Wirtschaft DIGITAL 2016, http://www.tns-infratest.com/WissensForum/Studien/monitoring-report_digitale_wirtschaft.asp

[21] http://www.plattform-i40.de/I40/Navigation/DE/Home/home.html

together create 'smart services.' In November 2016, the government published a funding programme called “Smart Service World II,"[22] promoting cross-cutting flagship solutions for SMEs in the fields of employment, mobility, housing and basic services.

In order to help SMEs catch up, the government has set up a network consisting of SME competence centres and one digital crafts competence centre.[23] The main purpose of the centres is to inform and sensitise SMEs about the potential provided by digitisation. The centres support SMEs in testing advanced technologies and in qualifying staff.

At present, digital hubs are emerging in several cities and regions, with a view to promoting closer cooperation between startups, SMEs, industry, science and administration.

In order to further improve the digital transformation of the economy, it will be important to continuously raise the awareness of the importance of digital strategies, in particular for medium sized companies. Digitisation of the health sector could bring important synergies and cost savings.

Highlight 2017:[24] The Einstein Center Digital Future (ECDF)

The new Einstein Center in Berlin has been conceived as an inter-university nucleus for research on the digitisation of society. The aim is to foster innovative, cutting-edge interdisciplinary research, and to provide training for young scholars. EUR 38.5 million are being invested in around 50 new professorships. ECDF, a public-private partnership, brings together the four Berlin universities, *Charité – Universitätsmedizin Berlin*, two universities of applied sciences, eight non-university institutes, and more than 20 industrial enterprises, as well as two federal ministries. Research will be focused around three thematic complexes: digital health, digital society and humanities as well as digital industry and services.

Einstein Centers have a lifespan of six years. The first funding phase of the ECDF will run from 1 April 2017 to 31 March 2020, the second – after a successful interim evaluation – from 1 April 2020 to 31 March 2023.

[22] http://www.digitale-technologien.de/DT/Navigation/EN/Foerderprogramme/Smart-Service-Welt-2/smart-service-welt-2.html

[23] 'Mittelstand 4.0 Centres of Excellence'

[24] Highlight 2016: 'Trials on the digital motorway test bed': To reflect, analyse and support the increasing automation and connection of modern vehicles, the "Digital A9 motorway test bed" has been launched, on which state of the art digital technology is installed to enable digital communication between the road and the vehicle as well as vehicle-to-vehicle. The digital motorway test bed is a technology neutral offer to industry and the research community and can be used by all stakeholders from the automotive industry, the digital technology sector and academia interested in testing their innovations. The trial is accompanied by scientific research and there will be an open transfer of knowledge.

5 Digital Public Services

5 Digital Public Services	Germany		Cluster	EU
	rank	score	score	score
DESI 2017	**20**	**0.46**	**0.59**	**0.55**
DESI 2016	20	0.45	0.56	0.51

	Germany				EU
	DESI 2017		DESI 2016		DESI 2017
	value	rank	value	rank	value
5a1 eGovernment Users	**19%** →	**23**	**19%**	**23**	**34%**
% internet users (last year)	2016		2015		2016
5a2 Pre-filled Forms	**38** ↑	**17**	**34**	**18**	**49**
Score (0 to 100)	2016		2015		2016
5a3 Online Service Completion	**83** →	**17**	**83**	**17**	**82**
Score (0 to 100)	2016		2015		2016
5a4 Open Data[25]	**51%** →	**20**	**51%**	**10**	**59%**
% of maximum score	2016		2015		2016

This is the section where Germany is performing worst and is hardly making any progress. Germany ranks 20th among EU countries for Digital Public Service take-up. Germany is one of the EU countries with the lowest online interaction between public authorities and citizens. Only 19% of Germans going online use eGovernment services actively. This figure hasn't changed since 2015. The National Regulatory Control Council *Nationaler Normenkontrollrat* regularly reports on the development of eGovernment in Germany[26]: Germany's federal structure poses specific challenges in establishing coherent and nationwide eGovernment services. Diverse and not necessarily interoperable systems create friction losses Moreover, [27] the existing digital public services may need to be better promoted.

The Digital Administration 2020 programme aims to ensure that in future public administration is generally electronically accessible for all citizens. It includes measures on electronic filing, the central DE-Mail gateway, the central e-ID service, an extended payment platform and public procurement. The existing organisations – and particularly the IT Planning Council - have the task to ensure that there are appropriate structures for the steering and coordination of federal IT. In order to facilitate the use of online services, it is planned to associate the administrative portals of the Federal Government and the *Länder* and to establish interoperable service accounts allowing the user to register once and then to use all the portals. The IT Planning Council also intends to adopt a digitisation programme in order to attain the goal of an interoperable, federal IT infrastructure which offers user-friendly digital administrative services for all citizens and companies as quickly, sustainably and efficiently as possible. Moreover In October 2016 Federal and *Lände*r level reached an important political agreement. By amending the constitution, the *Grundgesetz*, the Federal level will be made responsible for ensuring secure access to all digital public services. The final design is currently discussed between the Federation and the *Lände*r in the legislative procedure underway; but this initiative could open the way for significant improvements.

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

[26] https://www.normenkontrollrat.bund.de/Webs/NKR/DE/Startseite/startseite_node.html

[27] http://www.egovernment-monitor.de/die-studie/2016.html