



# **Digital Economy and Society Index (DESI) 2020**

**Sweden**

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## About the DESI

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*The European Commission has been monitoring Member States' digital progress through the Digital Economy and Society Index (DESI) reports since 2014. The DESI reports include both country profiles and thematic chapters. In addition, an in-depth telecoms chapter is annexed to the reports for each Member State.*

*The DESI country reports combine quantitative evidence from the DESI indicators across the five dimensions of the index with country-specific policy insights and best practices.*

*The current COVID-19 pandemic has shown how important digital assets have become to our economies and how networks and connectivity, data, AI and supercomputing as well as basic and advanced digital skills sustain our economies and societies by allowing work to continue, tracking the spread of the virus and accelerating the search for medications and vaccines.*

*Member States have put in place specific measures to mitigate the impact of the pandemic. A dedicated section in each country details them. Digital will also play a key role in the economic recovery as the European Council and the Commission have undertaken to frame the support to the recovery along the twin transition to a climate neutral and resilient digital transformation. In this framework, the deployment of 5G and very high capacity networks (VHCNs), digital skills, the digitisation of companies and the public administration are crucial for a robust recovery. The DESI monitors their progress in each Member State.*

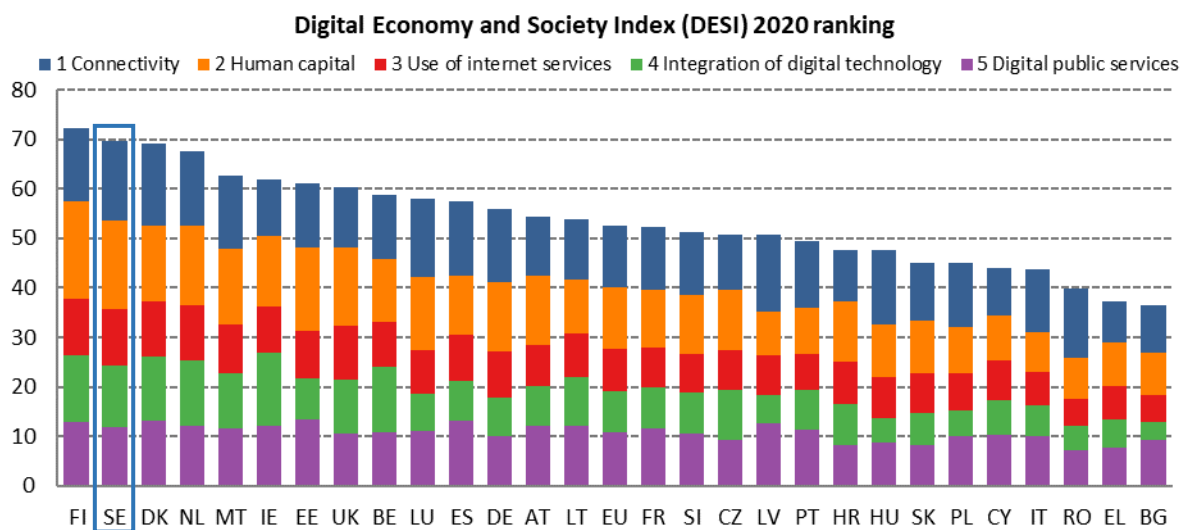
*As regards the thematic chapters, the DESI 2020 report includes a European-level analysis of broadband connectivity, digital skills, use of the internet, digitisation of businesses, digital public services, emerging technologies, cyber security, the ICT sector and its R&D spending and Member States' use of Horizon 2020 funds.*

*To improve the methodology of the index and take account of the latest technological developments, a number of changes were made to the 2020 edition of DESI, which now includes Fixed very high capacity network (VHCN) coverage. The DESI was re-calculated for all countries for previous years to reflect the changes in the choice of indicators and corrections made to the underlying data. Country scores and rankings may thus have changed compared with previous publications. As the figures refer to 2019, the United Kingdom is still included in the 2020 DESI, and EU averages are calculated for 28 Member States. For further information, please consult the DESI website: <https://ec.europa.eu/digital-single-market/en/desi>.*

*It is noted that statements regarding planned or potential State aid measures record intentions declared by Member States and do not pre-judge or pre-empt the assessment of such measures by the Commission under the relevant state aid rules. The DESI report is not meant to provide any assessment of the compliance of such measures with state aid rules and procedures.*

## Overview

	Sweden		EU
	rank	score	score
<b>DESI 2020</b>	<b>2</b>	<b>69.7</b>	<b>52.6</b>
DESI 2019	2	67.5	49.4
DESI 2018	1	64.0	46.5



Sweden is a digital leader, ranking 2<sup>nd</sup> out of the 28 EU Member States with a score of 69.7 in the Digital Economy and Society Index (DESI) 2020, based on data prior to the pandemic.

The Swedish government adopted a digitisation strategy in 2017 with the overarching goal of making Sweden the world leader in harnessing the opportunities offered by digitisation. In order to progress, it is important to link the strategy to specific policy instruments and concrete targets, action plans, budget lines and clear responsibilities<sup>(1)</sup>.

Sweden is the front-runner when it comes to connectivity (ranking 2<sup>nd</sup> in the EU), but still faces challenges when it comes to the roll-out of broadband and coverage of remaining sparsely populated areas, as well as the timely assignment of 5G bands.

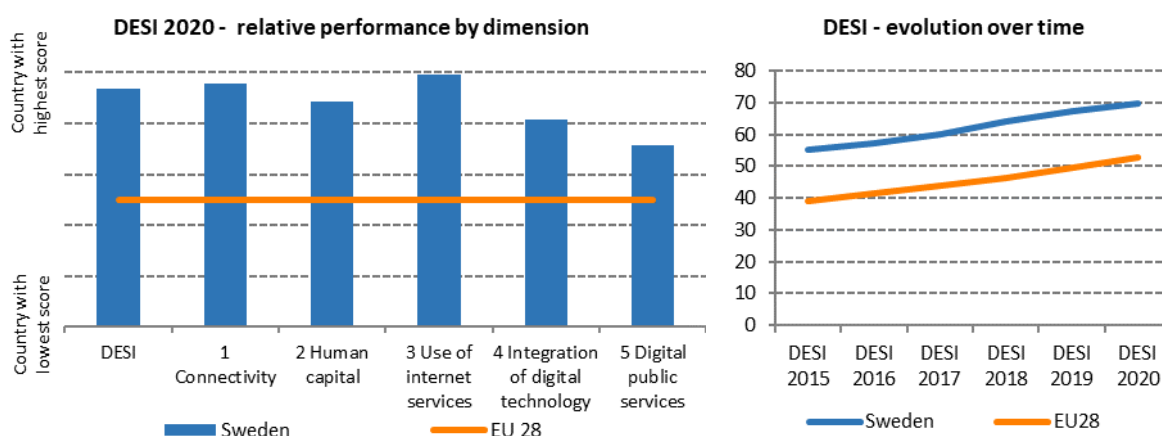
Sweden's human capital is one of its strongest competitive advantages (ranking 2<sup>nd</sup>). 72% of the population has at least basic digital skills and 46% above basic digital skills. To keep its technological edge it is important that the country addresses the unmet demand for digital experts.

Sweden also ranks 2<sup>nd</sup> when it comes to internet use. Almost all Swedes use the internet daily. Streaming of film, TV and music are all popular. Swedes are also keen users of online banking and shopping.

Swedish companies are integrating digital technology relatively well (ranking 6<sup>th</sup>), although progress is slowing and other countries are catching up. There is also a big difference between large companies and SMEs. To further boost the digital transformation of the Swedish economy, it is important that SMEs become more aware of the advantages of data-driven innovation.

The Swedish public sector is digitally mature, ranking 10<sup>th</sup> in the EU, but other countries are progressing faster. The country ranks 23<sup>rd</sup> when it comes to open data, and it is important that it focuses on data as a strategic resource.

<sup>(1)</sup> <https://digitaliseringsradet.se/media/1272/laegesrapport-digital-ledning-dnr-19-5942.pdf>



### The role of digital to manage the coronavirus pandemic and to support the economic recovery

The current COVID-19 crisis is having an important impact on key societal indicators, relating to the use of internet services by citizens. This does not show in the latest 2019 official statistics as reported in DESI. Consequently, the DESI 2020 findings need to be read in conjunction with the strained demand that has been put on digital infrastructure and services during the pandemic and the immediate actions taken by the Member States. Similarly, as Europe progressively exits from the pandemic, the recovery must be planned taking into account the lessons learnt from this crisis. This means a particular attention to the indicators relevant for a stronger and more resilient digital transformation and economic recovery, notably very high capacity networks (VHCNs) and 5G, digital skills, advanced digital technologies for businesses and digital public services.

Sweden has taken a number of targeted measures in digital to deal with the COVID-19 crisis. They include launching the platform *Skola Hemma*, which provides support to teachers and school leaders in the form of free tools, resources, practical tips, webinars etc. to handle remote teaching<sup>2</sup>. The government organised a national, virtual hackathon to come up with digital solutions to be used to combat the COVID-19 outbreak<sup>3</sup>. The Swedish Civil Contingencies Agencies is developing a digital self-assessment test, which aims to strengthen the public's risk awareness. The government has also requested the Swedish Post and Telecom Authority to take measures to help the elderly use IT and electronic communication services. Moreover, around €2.4 million has been allocated to the regions to develop and strengthen online communication channels between healthcare providers, patients with mental health problems and relatives when physical visits are not possible as a result of the spread of COVID-19<sup>4</sup>.

Looking forward, as regards the DESI indicators that are especially relevant for the economic recovery after the COVID-19 crisis, Sweden performs well when it comes to 5G and Very High Capacity Networks (VHCN) and digital skills. On the other hand, it has a relatively weak performance in the digitisation of businesses and in digital public services.

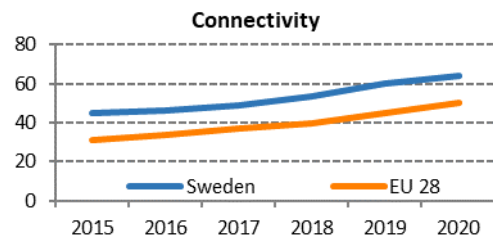
<sup>2</sup> <https://www.skolahemma.se/>

<sup>3</sup> <https://www.hackthecrisis.se/>

<sup>4</sup> <https://www.regeringen.se/pressmeddelanden/2020/04/utokade-digitala-kontaktvagar-for-att-varna-psyisk-halsa/>

# 1 Connectivity

1 Connectivity	Sweden		EU
	rank	score	score
<b>DESI 2020</b>	<b>2</b>	<b>64.4</b>	<b>50.1</b>
DESI 2019	1	60.1	44.7
DESI 2018	2	53.5	39.9



	Sweden			EU
	DESI 2018	DESI 2019	DESI 2020	DESI 2020
<b>1a1 Overall fixed broadband take-up</b>	<b>78%</b>	<b>78%</b>	<b>86%</b>	<b>78%</b>
% households	2017	2018	2019	2019
<b>1a2 At least 100 Mbps fixed broadband take-up</b>	<b>48%</b>	<b>55%</b>	<b>66%</b>	<b>26%</b>
% households	2017	2018	2019	2019
<b>1b1 Fast broadband (NGA) coverage</b>	<b>78%</b>	<b>86%</b>	<b>85%</b>	<b>86%</b>
% households	2017	2018	2019	2019
<b>1b2 Fixed Very High Capacity Network (VHCN) coverage</b>	<b>66%</b>	<b>72%</b>	<b>77%</b>	<b>44%</b>
% households	2017	2018	2019	2019
<b>1c1 4G coverage</b>	<b>96%</b>	<b>96%</b>	<b>97%</b>	<b>96%</b>
% households (average of operators)	2017	2018	2019	2019
<b>1c2 Mobile broadband take-up</b>	<b>122</b>	<b>121</b>	<b>124</b>	<b>100</b>
Subscriptions per 100 people	2017	2018	2019	2019
<b>1c3 5G readiness</b>	<b>NA</b>	<b>22%</b>	<b>22%</b>	<b>21%</b>
Assigned spectrum as a % of total harmonised 5G spectrum		2019	2020	2020
<b>1d1 Broadband price index</b>	<b>NA</b>	<b>NA</b>	<b>66</b>	<b>64</b>
Score (0 to 100)			2019	2019

Sweden ranks second in connectivity, scoring 64.4, well above the EU average (50.1). Overall take-up of fixed broadband increased from 78% in 2017 to 86% in 2019, which is higher than the EU average of 78%. Fast broadband (NGA) coverage went up from 78% in 2017 to 85% in 2019, close to the EU average of 86%. Sweden has achieved a 66% take-up rate for at least 100 Mbps fixed broadband, almost two and a half times the EU average of 26%. Very high capacity network coverage also increased, reaching 77% (compared to 72% in 2018), exclusively thanks to FTTP networks, and Sweden now ranks eighth at EU level. In 2019, the prices remain close to the EU average and Sweden scores 66 on the broadband price index, compared with the EU average of 64. Take-up of mobile broadband has reached 124 subscriptions per 100 people and is one of the highest in Europe. Average 4G coverage in Sweden was 97% in 2019 up from 96% in 2018, while the European average is 96%.

Sweden is a front-runner in very high capacity connectivity in Europe, but in order to reach its ambitious national broadband targets it needs to address coverage in remote areas. 84% of Swedish households already had access to 100 Mbps speeds in 2018. The goal is by 2020 to reach 95% coverage of 100 Mbps, and by 2025, 99.9% coverage of 100 Mbps and 98% coverage of 1 Gbps (homes passed). To reach these targets, roll-out in remaining sparsely populated areas needs to speed up. For the next 3 years, the Swedish government has allocated SEK 650 million (€61.16 million) for broadband development. Sweden is preparing a new national State aid scheme for the distribution of this funding for the effective deployment of broadband. Approximately SEK 150 million (€14.11 million) will be available for 2020. The Swedish Post and Telecom Authority (PTS) estimates that in addition to the allocations and commercial investments, an additional investment of SEK 22 billion (€2.07 billion) is required in the next three years in order to reach all targets set for 2025 in the national broadband

strategy. In June 2019, the Swedish government gave PTS the assignment to evaluate how future support for broadband could be designed effectively, based on the PTS's earlier report from 2017 with suggestions for future support measures in the broadband area. PTS's proposal for the State aid scheme was submitted to the government in January 2020 and concerns a state-subsidised scheme. The new state-aid scheme aims to promote the support of a long-term sustainable infrastructure of good-performance enabling access to 1 Gbps speeds, as well as a cost-effective expansion that contributes to the goals of the broadband strategy for 2020 and 2025. The support scheme sets regional priorities and covers non-urban areas, where there is no access to next-generation access networks. Following an ordinance from the Swedish government, the Swedish Transport Administration managed to make the permit procedure shorter and more efficient, in order to tackle delays in deployment in sparsely populated areas due to permit-granting procedures. Private investments in broadband are still ongoing, but the pace of fibre roll-out has decreased since the 2016 peak. The main reason for this is probably market saturation and the fact that mostly rural/difficult/rocky areas remain to be covered. Telia, the largest private investor, announced an investment slow-down and is examining other business scenarios for roll-out in difficult/rural areas, such as Fixed Wireless Access. Local networks continue their investments, and IP-Only has announced an increase in its fibre investments in the next years.

Sweden ranks 13th in the 5G readiness indicator<sup>(5)</sup>. A total of 60 licenses for 5G test trials have been issued since the release of PTS spectrum plan for 5G test licenses in March 2017, with 38 in the 3.4 – 3.8 GHz, 8 in the 2.3 GHz and 4 in the 26 GHz-band at 27 different locations. In Sweden, 37 5G trial licences in 15 different locations (mainly urban) have been issued for spectrums in the 5G pioneer bands, 3.4-3.8 GHz and 24.25-27.5 GHz as well as in the 2.3 GHz band. 48% of the spectrum harmonised at EU level for wireless broadband has been assigned. There is still no decision from the Government on the use of the reserved 2×10 MHz FDD spectrum in the 700MHz band, and no decision for the 20 MHz SDL spectrum that remained unsold. Despite the fact that this spectrum, according to the Government's decision, is still available for DTT until the end of 2020, both the Ministry and the PTS confirmed that the entire 700 MHz band is no longer used for terrestrial TV broadcasting. The auction for the 3.4-3.8 GHz band was initially planned for March 2020 but has been postponed until October 2020 to take into consideration the national security issues concerning 5G roll-out. PTS ran a public consultation for the 26 GHz in January 2020.

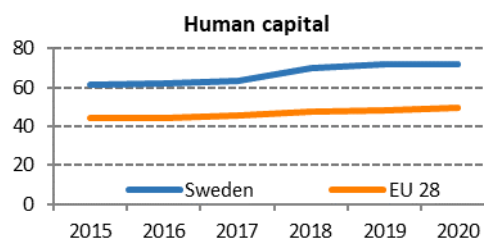
Sweden is a front-runner in ultrafast connectivity in Europe. The biggest challenge for achieving the goals of its ambitious national broadband strategy by 2020 is to address the difficulties of ensuring roll-out and coverage of the remaining sparsely populated areas. In this respect, a spectrum policy consistent with its investment needs will be key. The successful deployment of 5G in Sweden depends on the timely availability and assignment of the 5G pioneer bands. The Ministry is working together with PTS and the other relevant authorities to solve the delays with the permit-granting procedures and to allocate funding more efficiently.

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<sup>(5)</sup> The 5G spectrum readiness indicator is based on the amount of spectrum already assigned and available for 5G use by 2020 within the 5G pioneer bands in each EU Member State. For the 3.4-3.8 GHz band, this means that only licences aligned with the technical conditions in the Annex to Commission Decision (EU)2019/235, are considered 5G-ready. For the 26 GHz band, only assignments aligned with the technical conditions in the Annex to Commission Implementing Decision (EU) 2019/784 are taken into account. By contrast, the percentage of harmonised spectrum takes into account all assignments in all harmonised bands for electronic communications services (including 5G pioneer bands), even if this does not meet the conditions of the 5G readiness indicator.

## 2 Human capital

2 Human capital	Sweden		EU
	rank	score	score
<b>DESI 2020</b>	<b>2</b>	<b>71.7</b>	<b>49.3</b>
DESI 2019	2	71.6	47.9
DESI 2018	2	69.9	47.6



	Sweden			EU
	DESI 2018	DESI 2019	DESI 2020	DESI 2020
	value	value	value	value
<b>2a1 At least basic digital skills</b>	<b>77%</b>	<b>77%</b>	<b>72%</b>	<b>58%</b>
% individuals	2017	2017	2019	2019
<b>2a2 Above basic digital skills</b>	<b>46%</b>	<b>46%</b>	<b>46%</b>	<b>33%</b>
% individuals	2017	2017	2019	2019
<b>2a3 At least basic software skills</b>	<b>78%</b>	<b>78%</b>	<b>74%</b>	<b>61%</b>
% individuals	2017	2017	2019	2019
<b>2b1 ICT specialists</b>	<b>6.3%</b>	<b>6.6%</b>	<b>6.8%</b>	<b>3.9%</b>
% total employment	2016	2017	2018	2018
<b>2b2 Female ICT specialists</b>	<b>2.8%</b>	<b>2.9%</b>	<b>3.0%</b>	<b>1.4%</b>
% female employment	2016	2017	2018	2018
<b>2b3 ICT graduates</b>	<b>3.5%</b>	<b>3.7%</b>	<b>4.3%</b>	<b>3.6%</b>
% graduates	2015	2016	2017	2017

Sweden ranks 2<sup>nd</sup> out of the 28 EU countries in the human capital dimension. In general, Swedes have a good level of digital skills. 46% of the Swedish adult population has above-basic digital skills. 52% of employees, self-employed and family workers have above basic digital skills, among the highest in the EU. Sweden also has a high number of ICT specialists compared to other EU countries, at 6.8% of total employment. Female ICT specialists account for 3% of total female employment, which is among the highest in the EU. However, 72% of Swedish enterprises (EU average 57%) who tried to recruit ICT specialists report that it is hard to fill vacancies. Moreover, only 4.3% of graduates study ICT, leaving Sweden at 12<sup>th</sup> place in the EU.

The Swedish education system is one of the most digitalised in the EU. A revised curriculum for early childhood learning is in place since autumn 2019. It aims, among others, to ensure that every child can use digital tools in a way that stimulates development and learning. In primary education, programming has been incorporated into the national curriculum since 2018 and national tests are being digitised. A digital strategy for school system<sup>(6)</sup> has been in place since 2017 and an action plan<sup>(7)</sup> was presented to the government in March 2019, containing 18 proposals involving different stakeholders. The slow start of the implementation of these actions casts doubt on whether the goals will be achieved by 2022.<sup>(8)</sup> However, in December, the government took a step forward and decided that the National Agency for Education will coordinate the digitisation of the school system<sup>(9)</sup>.

To inspire more people to be willing to participate in digital development the association 'Future Work Forum' launched *Digital@Dag* (Digital Day) for the first time in November 2019. It aims to be a

<sup>(6)</sup> <http://skoldigiplan.se/nationelldigitaliseringsstrategi.2417.html>

<sup>(7)</sup> <http://skoldigiplan.se/>

<sup>(8)</sup> <http://skoldigiplan.se/download/18.57b4a3ba16e6b961dbf6812c/1574065764134/Lagesbeskrivning-november-2019-Nationell-handlingsplan-for-digitalisering-av-skolvasendet.pdf>

<sup>(9)</sup> <https://www.regeringen.se/debattartiklar/2019/12/skolverket-far-ansvar-for-digitaliseringen/>

nationwide thematic day on the opportunities and challenges of digitalisation, which involves 100 actors<sup>(10)</sup>.

To help tackle the lack of Artificial Intelligence (AI) experts, the Swedish government is putting a special focus on education, including professional education and re-training, in the 'National Focus on AI'<sup>(11)</sup>. It has also provided extra government funding to universities to organise short specialist courses to strengthen life-long learning skills related to the development and use of AI. In 2019, the government also tasked the Swedish Higher Education Authority and the Agency for Economic and Regional Growth with analysing and providing suggestions on how the pool of digital experts can be developed both in the short and long term<sup>(12)</sup>.

The Swedish Digital Skills and Jobs Coalition, led by the IT and telecom industries, was launched in 2018. It has close to 30 members, including industry, employer associations, unions and representatives from the education sector. The aim of the Coalition is to increase awareness of the need for digital competences in society. It emphasises the need for cooperation and coordination to ensure digital competences for all citizens in an accessible and inclusive way.

The EU Code Week is supported by volunteer ambassadors, leading teachers and the Swedish Association of Local Authorities and Regions (SALAR). Sweden ranked 37<sup>th</sup> out of over 80 participating countries in 2019, and counted 298 activities involving nearly 11,000 people. 63% of activities took place in schools and the average female participation rate was 51%<sup>(13)</sup>.

To reach the goals set out in the digitisation strategy for the school system by 2022, all actors must dedicate appropriate resources and work more actively. Skills mismatches in the labour force limit the capacity of companies to innovate and capitalise from innovation. If Sweden wants to keep its edge in the digital economy, increasing the number of digital experts, involving more women in digitally intensive sectors and up-skilling the labour force are factors of great importance.

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<sup>(10)</sup> <https://digitalidag.org/>

<sup>(11)</sup> <https://www.regeringen.se/informationsmaterial/2018/05/nationell-inriktning-for-artificiell-intelligens/>

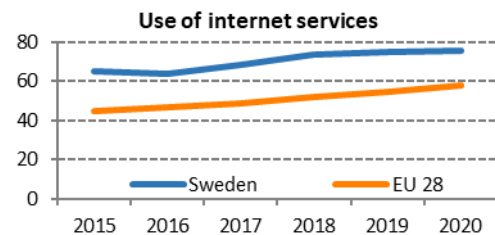
<sup>(12)</sup> <https://www.uka.se/om-oss/aktuellt/nyheter/2019-08-23-uka-far-nytt-uppdrag---kompetensforsorjning-av-digital-spetskompetens.html>

<sup>(13)</sup> <https://blog.codeweek.eu/post/190421452885/new-record-for-eu-code-week-42-million>



### 3 Use of internet services

3 Use of internet services	Sweden		EU
	rank	score	score
DESI 2020	2	76.0	58.0
DESI 2019	2	75.0	55.0
DESI 2018	1	73.7	51.8



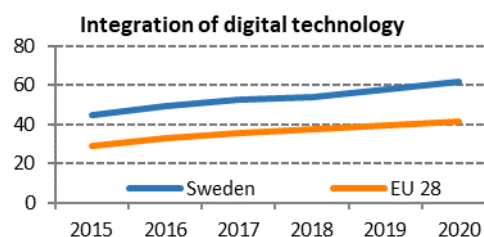
	Sweden			EU
	DESI 2018	DESI 2019	DESI 2020	DESI 2020
	value	value	value	value
<b>3a1 People who have never used the internet</b>	<b>2%</b>	<b>4%</b>	<b>2%</b>	<b>9%</b>
% individuals	2017	2018	2019	2019
<b>3a2 Internet users</b>	<b>95%</b>	<b>91%</b>	<b>95%</b>	<b>85%</b>
% individuals	2017	2018	2019	2019
<b>3b1 News</b>	<b>88%</b>	<b>88%</b>	<b>82%</b>	<b>72%</b>
% internet users	2017	2017	2019	2019
<b>3b2 Music, videos and games</b>	<b>91%</b>	<b>92%</b>	<b>92%</b>	<b>81%</b>
% internet users	2016	2018	2018	2018
<b>3b3 Video on demand</b>	<b>49%</b>	<b>61%</b>	<b>61%</b>	<b>31%</b>
% internet users	2016	2018	2018	2018
<b>3b4 Video calls</b>	<b>58%</b>	<b>58%</b>	<b>65%</b>	<b>60%</b>
% internet users	2017	2018	2019	2019
<b>3b5 Social networks</b>	<b>74%</b>	<b>76%</b>	<b>74%</b>	<b>65%</b>
% internet users	2017	2018	2019	2019
<b>3b6 Doing an online course</b>	<b>18%</b>	<b>18%</b>	<b>19%</b>	<b>11%</b>
% internet users	2017	2017	2019	2019
<b>3c1 Banking</b>	<b>90%</b>	<b>91%</b>	<b>87%</b>	<b>66%</b>
% internet users	2017	2018	2019	2019
<b>3c2 Shopping</b>	<b>84%</b>	<b>84%</b>	<b>84%</b>	<b>71%</b>
% internet users	2017	2018	2019	2019
<b>3c3 Selling online</b>	<b>22%</b>	<b>27%</b>	<b>NA</b>	<b>23%</b>
% internet users	2017	2018	2019	2019

95% of Swedes use the internet every day or almost every day ranking 2<sup>nd</sup> in the EU. However, according to the 2019 edition of *The Swedes and the internet*<sup>(14)</sup> 9% of the population above 12 years old say they do not feel part of the digital society. According to the report, Youtube is the biggest provider for watching films online (bigger than Netflix). Moreover, 47% of Swedes listen to music online every day, and the proportion of people who pay for digital subscriptions to film and music online is increasing. Swedes also use social media, but 40% do not believe that the time they spend there is meaningful. When it comes to gaming, more than half of internet users play online and a tenth play for money. One fifth of internet users also watch other people play games. In the 12-15 age group, two thirds watch others play. The majority of Swedes use internet banking, mobile bank identification and payment apps. 80% feel safe when paying online. Shopping online is popular and many internet users also sell goods or services online.

<sup>(14)</sup> <https://svenskarnaochinternet.se/rapporter/svenskarna-och-internet-2019/>

## 4 Integration of digital technology

4 Integration of digital technology	Sweden		EU
	rank	score	score
<b>DESI 2020</b>	<b>6</b>	<b>62.1</b>	<b>41.4</b>
DESI 2019	6	57.9	39.8
DESI 2018	6	54.2	37.8



	Sweden			EU
	DESI 2018	DESI 2019	DESI 2020	DESI 2020
	value	value	value	value
<b>4a1 Electronic information sharing</b>	<b>31%</b>	<b>31%</b>	<b>37%</b>	<b>34%</b>
% enterprises	2017	2017	2019	2019
<b>4a2 Social media</b>	<b>25%</b>	<b>25%</b>	<b>40%</b>	<b>25%</b>
% enterprises	2017	2017	2019	2019
<b>4a3 Big data</b>	<b>10%</b>	<b>10%</b>	<b>10%</b>	<b>12%</b>
% enterprises	2016	2018	2018	2018
<b>4a4 Cloud</b>	<b>NA</b>	<b>43%</b>	<b>43%</b>	<b>18%</b>
% enterprises	2017	2018	2018	2018
<b>4b1 SMEs selling online</b>	<b>28%</b>	<b>30%</b>	<b>30%</b>	<b>18%</b>
% SMEs	2017	2018	2019	2019
<b>4b2 e-Commerce turnover</b>	<b>15%</b>	<b>18%</b>	<b>18%</b>	<b>11%</b>
% SME turnover	2017	2018	2019	2019
<b>4b3 Selling online cross-border</b>	<b>10%</b>	<b>10%</b>	<b>10%</b>	<b>8%</b>
% SMEs	2017	2017	2019	2019

Sweden remains 6<sup>th</sup> in the EU when it comes to integration of digital technologies in enterprises. 50% of Swedish enterprises get a high or very high digital intensity score. However, there is a big difference between large companies and SMEs. 18% of SMEs have very low digital intensity compared to 1% of large companies. Moreover, only 31% of SMEs provide training for their staff to develop or upgrade their skills in information and communication technologies, compared to 80% in large companies. Swedish companies use cloud services, social media and sell online to a relatively high extent compared to European counterparts. However, they lag behind when it comes to using big data, where Sweden ranks 19<sup>th</sup>, and in selling online across border to other EU countries (10<sup>th</sup> place).

In line with the Swedish smart industry strategy, the government supports the digital transformation of SMEs through, for example, vouchers for consultancy services (€10.7 million). The government has also provided €1.46 million to improve the digital skills of management teams of SMEs. Moreover, to help SMEs become better at exploiting the potential of data-driven innovation and data as a resource – an area where Swedish companies fall behind their European counterparts – the government has tasked the Swedish Agency for Economic and Regional Growth with helping SMEs use data as a strategic resource. The Agency will identify sectors and industries where there is the greatest potential, and organise seminars and pilot projects in a laboratory environment<sup>(15)</sup>.

The Agency and Almi<sup>(16)</sup> have also been tasked with supporting SMEs in rural areas with digitisation process<sup>(17)</sup>. Companies are offered help to create clear targets and action plans, as well as information

<sup>(15)</sup> <https://www.regeringen.se/pressmeddelanden/2019/06/data-som-resurs-ska-hoja-sma-och-medelstora-foretag/>

<sup>(16)</sup> Almi is a state-owned company which consists of 16 regional subsidiaries and the Almi Invest subgroup. The regional subsidiaries provide loans and business development opportunities.

<sup>(17)</sup> <https://www.almi.se/nyheter/nationella/foretag-pa-landsbygden-ska-bli-bättre-pa-digitalisering/>

on how the investment in digital can be financed in the form of loans, venture capital, cheques and grants. The budget for 2019-2020 is €5.4 million<sup>(18)</sup>.

AI is expected to have a strong impact on Swedish society. The Swedish government adopted a national approach on AI in 2018 with the aim of making Sweden a leader in harnessing the opportunities that the use of AI can offer to strengthen Sweden's welfare and competitiveness. The Swedish Innovation Agency (Vinnova) will invest €100 million over the next 10 years in AI-related projects such as strengthening AI environments and development of projects. This complements the investment of the same amount made by the Wallenberg Foundation in machine learning, deep learning, explainable AI as well as the mathematics behind AI. In June 2019, the government announced the investment of SEK 40 million in professional education in AI. Universities – led by Chalmers University of Technology – will develop short specialists courses targeting professionals to strengthen their skills related to the development of AI<sup>(19)</sup>.

Sweden is committed to advancing and to investing strategically in new digital technologies through EU-coordinated programmes. The country is a member of the EuroHPC Joint Undertaking and it has signed the declaration establishing a European Blockchain partnership and the declaration on cooperation on AI. At the end of 2019, Sweden also signed the declaration on quantum communication infrastructure<sup>(20)</sup>.

To further boost the digital transformation of the Swedish economy, it is important that SMEs become more aware of the advantages of data-driven innovation. To keep its technological edge, it is important that the country also tackles the lack of digital experts.

#### Highlight 2020: AI Innovation of Sweden

AI Innovation of Sweden<sup>(21)</sup> is a national centre for applied AI research and innovation, with the aim of strengthening the competitiveness of Swedish industry and of its public sector. The initiative links academia, business and the private sector. It is funded by Vinnova and the Västra Götaland Region and brings together more than 50 partners from industrial and public sectors, research institutions, and the academic world. AI Innovation Of Sweden focuses on accelerating the implementation of AI through sharing of knowledge and data and co-location of competences and collaboration projects, all with a strong emphasis on ethics, transparency, and security. The AI Innovation Centre was inaugurated in February 2019 and is situated in Gothenburg, but nodes will also open in other locations in Sweden.

<sup>(18)</sup> <https://tillvaxtverket.se/amnesomraden/regional-kapacitet/landsbygdsuppdrag.html>

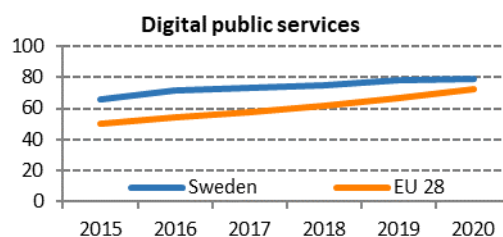
<sup>(19)</sup> Sources AI strategy of Sweden + information survey with MS.

<sup>(20)</sup> <https://ec.europa.eu/digital-single-market/en/news/future-quantum-eu-countries-plan-ultra-secure-communication-network>

<sup>(21)</sup> <https://www.ai.se/en/about>

## 5 Digital public services

5 Digital public services	Sweden		EU
	rank	score	score
<b>DESI 2020</b>	<b>10</b>	<b>79.3</b>	<b>72.0</b>
DESI 2019	9	77.9	67.0
DESI 2018	6	74.8	61.8



	DESI 2018	Sweden	DESI 2020	EU
	value	DESI 2019	value	DESI 2020
		value		value
<b>5a1 e-Government users</b>	<b>90%</b>	<b>93%</b>	<b>89%</b>	<b>67%</b>
% internet users needing to submit forms	2017	2018	2019	2019
<b>5a2 Pre-filled forms</b>	<b>74</b>	<b>76</b>	<b>76</b>	<b>59</b>
Score (0 to 100)	2017	2018	2019	2019
<b>5a3 Online service completion</b>	<b>90</b>	<b>92</b>	<b>92</b>	<b>90</b>
Score (0 to 100)	2017	2018	2019	2019
<b>5a4 Digital public services for businesses</b>	<b>92</b>	<b>92</b>	<b>92</b>	<b>88</b>
Score (0 to 100) - including domestic and cross-border	2017	2018	2019	2019
<b>5a5 Open data</b>	<b>NA</b>	<b>NA</b>	<b>55%</b>	<b>66%</b>
% of maximum score			2019	2019

Swedes are among the top users of e-Government services, but other EU countries are progressing faster. According to the annual report 'Swedes and the internet'<sup>(22)</sup>, 85% of those above 16 years old believe that digital public services make their lives easier. One contributing reason may be that it is possible to use mobile bank identification for most e-services, and 84% of the population (+16 years) and nearly 99% of those aged between 21 and 50 have an electronic bank identity. 51% of the population (+16) use a digital mailbox to receive information from over 100 public authorities, municipalities and regions. Sweden ranks 23<sup>rd</sup> when it comes to open data, which pulls the country's ranking in digital public services down.

In 2019, the government gave the Agency for Digital Government (DIGG) and several other agencies assignments related to open data and the use of new technologies, including artificial intelligence in the public sector<sup>(23)</sup>. Two assignments<sup>(24)</sup> aim to establish a national framework for basic data and a common digital infrastructure that will simplify and streamline information exchange between authorities, regions and municipalities. The underlying principle is that citizens and companies should only have to report information once.

DIGG estimates that the use of AI within public administration could strengthen the welfare system and create an economic value equivalent to SEK 140 billion per year, which equals 6% of the total public expenditure in Sweden. Areas that need to be improved to increase the public's ability to use AI include governance and management, legal development, skills provision, digital infrastructure, data management and innovation<sup>(25)</sup>.

In 2019, the government tasked SALAR with boosting digital skills and competences in municipalities and regions. The aim is to increase the ability to take advantage of the opportunities offered by

<sup>(22)</sup> <https://svenskarnaochinternet.se/rapporter/svenskarna-och-internet-2019/>

<sup>(23)</sup> <https://www.regeringen.se/49a186/contentassets/ba64455f7f9e435b8cb5b675d3681bf7/uppdrag-att-okaden-offentliga-forvaltningens-formaga-att-tillgangliggöra-oppna-data.pdf>

<sup>(24)</sup> <https://www.digg.se/nyheter--publikationer/nyheter/digg-far-tva-nationella-uppdrag-for-att-utveckla-gemensamma-it-losningar>

<sup>(25)</sup> <https://www.mynewsdesk.com/se/digg-myndigheten-foer-digital-foervaltning/pressreleases/vaerdet-av-ai-inom-det-offentliga-beraeknas-till-miljard-aaarigen-2960861>

digitalisation, manage its challenges and increase the modernisation of welfare in the public sector. SALAR offers workshops in digital competence development for politicians, senior officials and other key people, adapted to the needs of municipalities and regions<sup>(26)</sup>.

Digital care is on the rise. The use of remote consultations has increased sharply in primary care, largely driven by two companies. This resulted in increased costs for the regions, but still only amounts to a small proportion of the primary care budget. A national recommendation for the pricing of digital care, along with a minimum patient fee for such contacts, has been reached<sup>(27)</sup>. Digital care also includes self-monitoring and registration of values, and computer programmes that use AI to give advice about health needs based on the patient's questions<sup>(28)</sup>.

In September 2019, the government presented new measures to strengthen information security and increase society's resilience to cyberattacks. In 2020, a national cybersecurity centre will be established with the aim of strengthening Sweden's overall ability to prevent, detect and manage cyber threats. In addition, the government has asked the Civil Contingencies Agency to carry out targeted educational actions and to develop a structure for monitoring systematic information security work in the public administrations<sup>(29)</sup>.

The Swedish public sector is digitally mature, but it is important to focus on data as a strategic resource and better leadership complemented with work on trust and accessibility in digital services. According to the OECD, there are good conditions for using data to build citizen-related services, analyse complex societal changes and promote digital innovation.

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<sup>(26)</sup> <https://skr.se/demokratiledningstyrning/digitalkompetensutveckling.27897.html>

<sup>(27)</sup> <http://www.oecd.org/publications/sweden-country-health-profile-2019-2dcb7ca6-en.htm>

<sup>(28)</sup> <https://skr.se/halsasjukvard/ehalsa/dethargorskrinomehalsa/digitalavardtjanster.28304.html>

<sup>(29)</sup> <https://www.regeringen.se/pressmeddelanden/2019/09/regeringen-genomfor-atgarder-for-starkt-informations--och-cybersakerhet/>