



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

2019 Country Report

**Portugal**

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## **About the DESI**

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*The European Commission has been monitoring Member States' digital competitiveness with the Digital Economy and Society Index (DESI) reports since 2015. The set of reports includes both country profiles and thematic chapters.*

*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. An in-depth telecoms chapter is annexed to the reports for each Member State.*

*The thematic chapters present a European-level analysis of broadband connectivity, digital skills, use of the internet, digitisation of businesses, digital public services, the ICT sector and its R&D spending, and Member States' use of Horizon 2020 funds.*

*To improve the methodology and take account of the latest technological developments, a number of changes have been made to the DESI for 2019. The DESI now covers:*

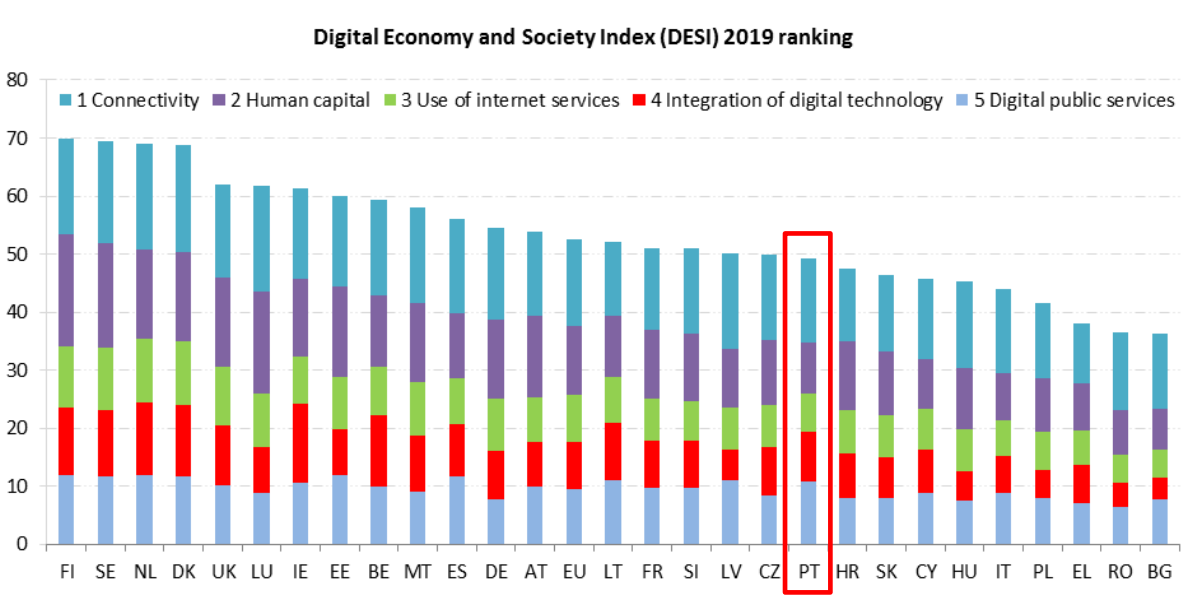
- *5G readiness,*
- *Above basic digital skills,*
- *At least basic software skills,*
- *Female ICT specialists,*
- *ICT graduates,*
- *People who never used the internet,*
- *Professional social networks,*
- *Doing an online course,*
- *Online consultations and voting,*
- *Individuals selling online,*
- *Big data,*
- *Medical data exchange and*
- *e-Prescriptions.*

*The DESI was re-calculated for all countries for previous years to reflect the above changes in the choice of indicators and corrections to the underlying data. Country scores and rankings may thus have changed compared with previous publications.*

*For further information, please consult the DESI website: <https://ec.europa.eu/digital-single-market/en/desi>.*

# Portugal overview

	Portugal		EU
	rank	score	score
<b>DESI 2019</b>	<b>19</b>	<b>49.2</b>	<b>52.5</b>
DESI 2018	19	46.8	49.8
DESI 2017	17	44.6	46.9

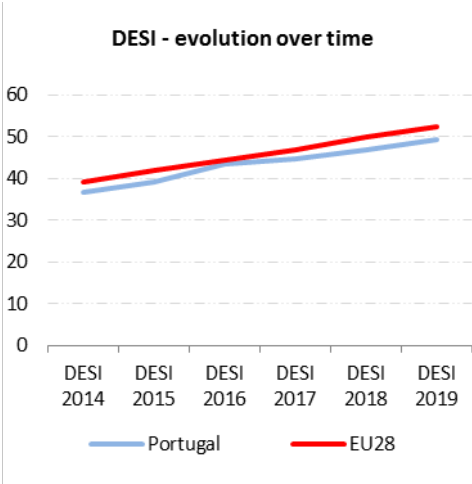
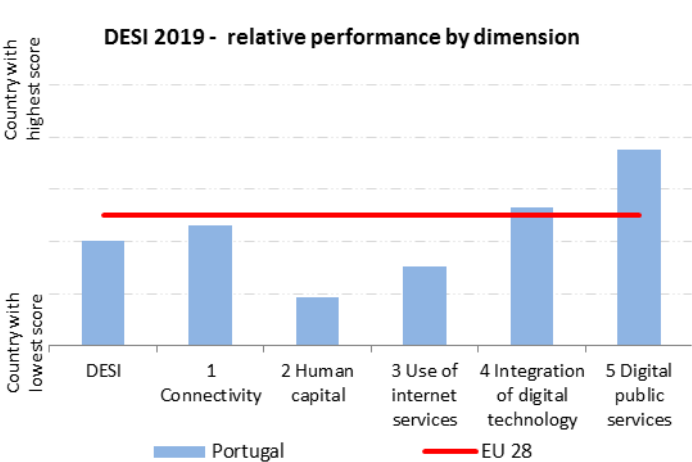


Portugal ranks 19<sup>th</sup> out of the 28 EU Member States in the European Commission's Digital Economy and Society Index (DESI) 2019. Compared with the previous edition of DESI, the country scored slightly better overall as well as in four of the five dimensions considered, but it did not improve its ranking. The largest improvement corresponds to the Digital public services dimension (Portugal's best performance), driven by a sizeable increase in the share of e-government users. Progress was also observed in the Connectivity dimension, thanks to an improvement in take-up rates for both fixed and mobile ultrafast broadband services. The country performs weakly in both the Human capital and Use of internet services dimensions, which is partly explained by the relatively large number of people who do not use the internet on a regular basis.

The Digital Agenda for Portugal, which was adopted in 2012 and subsequently updated, seeks to improve broadband connectivity and address societal challenges; e.g. delivering better public services to citizens, promoting smart mobility, employment, e-commerce and the digital economy, and reducing the digital gap between urban and peripheral regions. In 2017, the Strategy for Public Administration's Digital Transformation was launched<sup>1</sup>. Also in 2017, Portugal launched two comprehensive policy initiatives on digital competences and digitisation of the economy:

<sup>1</sup> <https://www.tic.gov.pt/>

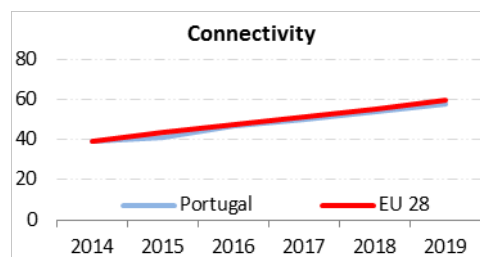
respectively, *INCoDe.2030*<sup>2</sup> (also acting as Portugal’s national coalition in the context of the Digital Skills and Jobs Coalition) and '*Indústria 4.0*'. Implementation of both continued during 2018.



<sup>2</sup> <https://www.incode2030.gov.pt/en/incode2030>

# 1 Connectivity

1 Connectivity	Portugal		EU
	rank	score	score
DESI 2019	18	57.9	59.3
DESI 2018	17	53.6	54.8
DESI 2017	18	49.9	51.2



	DESI 2017	Portugal		EU	
	value	DESI 2018	DESI 2019	DESI 2019	DESI 2019
		value	value	rank	value
<b>1a1 Fixed broadband coverage</b> % households	94%	93%	94%	23	97%
	2016	2017	2018		2018
<b>1a2 Fixed broadband take-up</b> % households	68%	72%	74%	16	77%
	2016	2017	2018		2018
<b>1b1 4G coverage</b> % households (average of operators)	93%	94%	96%	16	94%
	2016	2017	2018		2018
<b>1b2 Mobile broadband take-up</b> Subscriptions per 100 people	55	65	70	27	96
	2016	2017	2018		2018
<b>1b3 5G readiness</b> Assigned spectrum as a % of total harmonised 5G spectrum	NA	NA	0%	13	14%
			2018		2018
<b>1c1 Fast broadband (NGA) coverage</b> % households	67%	72%	76%	22	83%
	2016	2017	2018		2018
<b>1c2 Fast broadband take-up</b> % households	43%	51%	56%	7	41%
	2016	2017	2018		2018
<b>1d1 Ultrafast broadband coverage</b> % households	NA	72%	76%	13	60%
		2017	2018		2018
<b>1d2 Ultrafast broadband take-up</b> % households	25%	35%	50%	2	20%
	2016	2017	2018		2017
<b>1e1 Broadband price index</b> Score (0 to 100)	69	72	78	21	87
	2016	2017	2018		2017

Portugal ranks 18<sup>th</sup> in the Connectivity dimension of DESI 2019. Portugal has good ultrafast broadband coverage (76 % of households, compared to an EU average of 60 %) and take-up (50 %, compared to an EU average of 20 %). Fixed broadband take-up rose from 72 % in 2017 to 74 % in 2018, narrowing the gap with the EU average (77 %). While there was a substantial improvement in mobile broadband take-up (from 65 subscriptions per 100 people in 2017 to 70 in 2018), it still lags behind the EU average (96 subscriptions per 100 people). Despite an improvement in the broadband price index in 2018, Portugal still ranks 21<sup>st</sup>. However, concerning this ranking, it should be noted that convergent bundling (i.e. including fixed and mobile internet and voice services) is the most representative method used by operators to sell electronic communications services in Portugal. Mobile 4G coverage has reached 96 %, two percentage points above the EU average. Mobile broadband prices for handset offers<sup>3</sup> have fallen over the past year (from EUR 29.8 to EUR 25.7), but are still above the EU average (EUR 22.3).

<sup>3</sup> 1 GB + 300 calls basket.

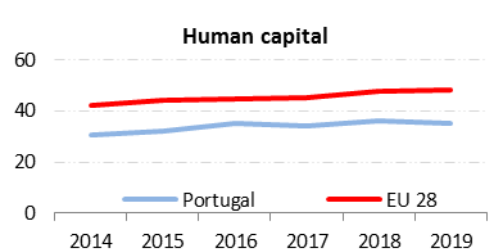
Investment and competition between private operators continue to drive the expansion of broadband. However, the Portuguese authorities continue to monitor projects in rural areas that benefitted from state aid in the past. In May 2018, the national regulatory authority, ANACOM, revised the wholesale tariffs for access to these rural networks and proposed to the government a reduction between 30 % and 66 % of Fibroglobal's offers. In addition, ANACOM proposed that Fibroglobal's bitstream offer be extended to 200 Mbps, 400 Mbps or 1 Gbps speeds and that a multicast functionality be introduced. The proposal was analysed by the government and a final decision was issued in April 2019. As submarine cables connecting mainland Portugal, the Azores and Madeira are expected to reach the end of their useful life in 2024/2025 (Columbus III in 2024 and Atlantis-2 in 2025), the 2019 state budget approved in October 2018 by the Portuguese Parliament provides for the government to take the necessary measures to maintain connectivity between Mainland Portugal and the Autonomous regions (Madeira and Azores) and between the Islands of such regions.

As regards 5G, in March 2018, ANACOM launched a public consultation regarding the assignment of the 700 MHz band. In July, it issued the national roadmap for the release of the 700 MHz band. The release of the band, which is to start in the last quarter of 2019 and to be completed by the end of May 2020, requires the migration of digital terrestrial television, DTT, to a new frequency band. The national roadmap includes the adoption of the simplest migration scenario, through the maintenance of current technology and without the need for any period of simultaneous transmission. The assignment of the 3.4 - 3.8 and 26 GHz bands was also subject to consultation. There are two operators with rights of use for 200 MHz in the 3.4 - 3.6 GHz band until 2024-2025. Portugal is studying the possible scenarios in order to reorganise and allow the use of sufficiently large blocks in this band by 31 December 2020. As of the first quarter of 2019, Portugal had assigned 36 % of the total 2090 MHz spectrum harmonised at EU level for wireless broadband.

Portugal performs well in the deployment of fast and ultrafast broadband connectivity. An additional effort is still required to ensure that fast broadband (by 2020) and ultrafast broadband (by 2025) reaches all households, including those in rural areas. Mobile broadband prices remain a challenge. Public authorities are preparing the ground for the deployment of 5G.

## 2 Human capital

2 Human capital	Portugal		EU
	rank	score	score
<b>DESI 2019</b>	<b>23</b>	<b>35.2</b>	<b>48.0</b>
DESI 2018	23	36.2	47.6
DESI 2017	23	34.2	45.4



	Portugal		EU		
	DESI 2017	DESI 2018	DESI 2019	DESI 2019	
<b>2a1 At least basic digital skills</b>	<b>48%</b>	<b>50%</b>	<b>50%</b>	<b>20</b>	<b>57%</b>
% individuals	2016	2017	2017		2017
<b>2a2 Above basic digital skills</b>	<b>28%</b>	<b>31%</b>	<b>31%</b>	<b>16</b>	<b>31%</b>
% individuals	2016	2017	2017		2017
<b>2a3 At least basic software skills</b>	<b>52%</b>	<b>55%</b>	<b>55%</b>	<b>19</b>	<b>60%</b>
% individuals	2016	2017	2017		2017
<b>2b1 ICT specialists</b>	<b>2.3%</b>	<b>2.4%</b>	<b>2.2%</b>	<b>26</b>	<b>3.7%</b>
% total employment	2015	2016	2017		2017
<b>2b2 Female ICT specialists</b>	<b>0.7%</b>	<b>0.8%</b>	<b>0.7%</b>	<b>27</b>	<b>1.4%</b>
% female employment	2015	2016	2017		2017
<b>2b3 ICT graduates</b>	<b>1.2%</b>	<b>1.2%</b>	<b>1.2%</b>	<b>27</b>	<b>3.5%</b>
% graduates	2014	2015	2016		2015

In DESI's Human capital dimension, Portugal ranks 23<sup>rd</sup> out of 28 Member States and scores significantly below the EU average. In 2017, half of the Portuguese population lacked basic digital skills and about 30 % had no digital skills at all (the EU average being 43 % and 17 % respectively). This is largely linked to the fact that many people have never used the internet (see section 3). In addition, Portugal continues to have one of the smallest shares of professionals with specialised ICT skills in total employment in the EU: 2.2 % in 2017 compared to an EU average of 3.7 %. In the same vein, the proportion of ICT specialists in total female employment is roughly half the EU average, and the share of ICT graduates in the total graduate pool is very low by EU standards.

Several initiatives seeking to improve digital skills and competences were undertaken over the past year, mostly in the context of *INCoDe.2030*, the country's national initiative in this domain. These notably include the definition of a work plan for '*Capacitar i4.0*', which seeks to integrate '*INCoDe.2030*' and '*Indústria 4.0*' (Portugal's strategy to modernise its productive tissue through digitisation) and increase digital preparedness. It involves the development of a number of assessment tools and capacity building activities. In addition, a financial envelope of EUR 20 million (for 2018-2019) has been allocated to training interventions, including mandatory ICT modules, for unemployed people with low qualifications ('*Vida Ativa Qualifica+*'). Promising initiatives to promote digital inclusion are also underway, such as *Creative Communities for Digital Inclusion*, which targets vulnerable groups of the population (see Highlight 2019 below), and the development of an Action Plan to close the gender gap in digital technologies that is in line with EU-level actions in this area. In

2018, a good number of schools and other organisations took part in the EU Code Week, a<sup>4</sup> grassroots movement to encourage people of all ages to code. More than 140 events were held in Portugal attracting nearly 18,000 participants.

Digital skills deficits remain a major obstacle for Portugal if it is to achieve its policy goals in terms of both social cohesion and economic competitiveness. Timely implementation and upscaling of existing initiatives, a number of which are at the pilot stage, will be crucial in this respect.

#### **Highlight 2019: Developing a network of Creative Communities for Digital Inclusion**

Creative Communities for Digital Inclusion (CCDIs), which has been underway since March 2018, is the flagship project under Axis 1 of INCoDe.2030 (*Inclusion*). It follows a collaborative and participatory approach to address barriers to digital inclusion such as socioeconomic inequalities, gender, age, special needs and cultural factors (e.g. people issued from minority groups, migrants). Ten CCDIs are being developed throughout the country around the following five models:

- *Municipal plans for digital inclusion*: with municipalities as activator entities and involving local stakeholders (typically, about 100 beneficiaries)
- *Mobile*: training measures targeting people with mobility difficulties, usually due to age and combined with isolation and geographic factors
- *Intergenerational*: usually involving two different groups; e.g. higher education students mentoring young people and children, or young people mentoring elderly people so they can "go digital"
- *Start-ups of digital inclusion initiatives*: with large organisations (e.g. foundations) as activators that cooperate with smaller ones such as schools to promote the development of CCDI
- *Networks*: incorporating digital aspects into the activities of existing networks in a range of sectors

CCDIs have 750 direct beneficiaries at the time of writing, with a total of 40 mentors involved. In addition, the project has served to develop training programmes in areas including certified training for mentoring, junior mentoring workshops, and teacher training on digital inclusion. Mapping, assessment and monitoring tools have likewise been developed in this context.

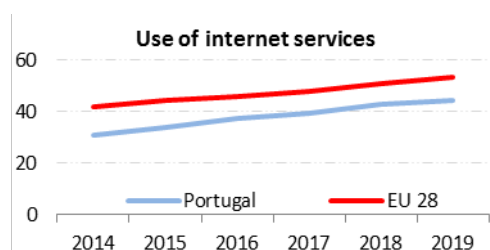
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<sup>4</sup> <https://codeweek.eu/>



### 3 Use of internet services

3 Use of internet services	Portugal		EU
	rank	score	score
DESI 2019	23	44.5	53.4
DESI 2018	23	42.8	50.7
DESI 2017	23	39.6	47.8

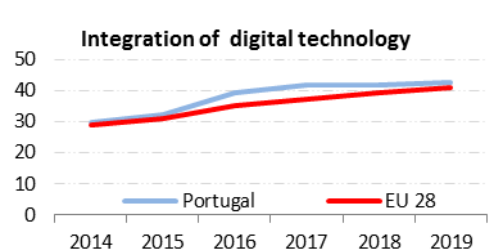


	DESI 2017	Portugal		EU	
	value	DESI 2018	DESI 2019	rank	DESI 2019
<b>3a1 People who never used the internet</b>	<b>26%</b>	<b>22%</b>	<b>23%</b>	<b>26</b>	<b>11%</b>
% individuals	2016	2017	2018		2018
<b>3a2 Internet users</b>	<b>68%</b>	<b>71%</b>	<b>71%</b>	<b>25</b>	<b>83%</b>
% individuals	2016	2017	2018		2018
<b>3b1 News</b>	<b>78%</b>	<b>80%</b>	<b>80%</b>	<b>13</b>	<b>72%</b>
% internet users	2016	2017	2017		2017
<b>3b2 Music, videos and games</b>	<b>83%</b>	<b>83%</b>	<b>83%</b>	<b>13</b>	<b>81%</b>
% internet users	2016	2016	2018		2018
<b>3b3 Video on demand</b>	<b>9%</b>	<b>9%</b>	<b>14%</b>	<b>22</b>	<b>31%</b>
% internet users	2016	2016	2018		2018
<b>3b4 Video calls</b>	<b>39%</b>	<b>44%</b>	<b>46%</b>	<b>22</b>	<b>49%</b>
% internet users	2016	2017	2018		2018
<b>3b5 Social networks</b>	<b>74%</b>	<b>76%</b>	<b>79%</b>	<b>8</b>	<b>65%</b>
% internet users	2016	2017	2018		2018
<b>3b6 Professional social networks</b>	<b>15%</b>	<b>16%</b>	<b>16%</b>	<b>13</b>	<b>15%</b>
% internet users	2015	2017	2017		2017
<b>3b7 Doing an online course</b>	<b>6%</b>	<b>6%</b>	<b>6%</b>	<b>17</b>	<b>9%</b>
% internet users	2016	2017	2017		2017
<b>3b8 Online consultations and voting</b>	<b>14%</b>	<b>15%</b>	<b>15%</b>	<b>3</b>	<b>10%</b>
% internet users	2015	2017	2017		2017
<b>3c1 Banking</b>	<b>41%</b>	<b>42%</b>	<b>52%</b>	<b>23</b>	<b>64%</b>
% internet users	2016	2017	2018		2018
<b>3c2 Shopping</b>	<b>43%</b>	<b>45%</b>	<b>49%</b>	<b>23</b>	<b>69%</b>
% internet users	2016	2017	2018		2018
<b>3c3 Selling online</b>	<b>11%</b>	<b>11%</b>	<b>11%</b>	<b>24</b>	<b>23%</b>
% internet users	2016	2017	2018		2018

Despite a higher overall score compared with a year earlier, Portugal has not progressed in this dimension's ranking and remains in the 23<sup>rd</sup> position out of 28 Member States. The share of people who have never used the internet, which remained stable in 2018, is double the EU average. In the same vein, relatively few Portuguese people use the internet at least once a week: 71 % compared to 81 % for the EU as a whole. The share of internet users who engage in online banking grew significantly, from 42 % in 2017 to 52 % in 2018, as did the share of those shopping online (from 45 % to 49 %). These figures remain, however, below the EU average of 64 % and 69 % respectively. Conversely, the shares of Portuguese internet users using social networks, participating in online votes and consultations, and reading news online are all above the EU average.

## 4 Integration of digital technology

4 Integration of digital technology	Portugal		EU
	rank	score	score
DESI 2019	11	42.8	41.1
DESI 2018	11	41.8	39.6
DESI 2017	11	41.8	37.6



	DESI 2017	Portugal		EU	
	value	DESI 2018	DESI 2019	rank	DESI 2019
<b>4a1 Electronic information sharing</b> % enterprises	44%	40%	40%	8	34%
<b>4a2 Social media</b> % enterprises	17%	16%	16%	19	21%
<b>4a3 Big data</b> % enterprises	13%	13%	13%	12	12%
<b>4a4 Cloud</b> % enterprises	11%	14%	16%	15	18%
<b>4b1 SMEs selling online</b> % SMEs	18%	17%	18%	12	17%
<b>4b2 e-Commerce turnover</b> % SME turnover	12%	13%	15%	5	10%
<b>4b3 Selling online cross-border</b> % SMEs	8%	8%	8%	16	8%

As regards the Integration of digital technology by businesses<sup>5</sup>, Portugal ranks 11<sup>th</sup> in the EU with an above-average overall score. The country registered progress regarding companies' use of cloud computing services and, following improvements over the past year, the proportion of both large outfits and SMEs selling online is now higher than for the EU as a whole. As a general rule, Portuguese SMEs are much less actively engaged in digitisation than their larger counterparts and, while data coverage for microenterprises (i.e. those with fewer than ten employees) is patchy, available evidence suggests that they are significantly lagging behind in this respect. For example, in 2016 only 32 % of Portuguese microenterprises had some sort of online presence and fewer than 10 % did any business online, compared with much larger shares among companies with ten employees or more<sup>6</sup>. This situation warrants particular attention considering that microenterprises account for about 41 % of employment and 24 % of added value in Portugal (compared with about 30 % and 21 % for the EU as a whole<sup>7</sup>).

<sup>5</sup> Unless otherwise stated, figures exclude companies in the financial sector as well as those with fewer than 10 employees.

<sup>6</sup> Source: IDC, ACEPI (2017): Estudo Anual da Economia e da Sociedade Digital em Portugal.

<sup>7</sup> Source: European Commission (2018): 2018 SBA Fact Sheet Portugal

Portugal is committed to the development of innovative digital technologies including by means of strategic investments coordinated at EU level: it is a member of the EuroHPC Joint Undertaking and has signed the European Blockchain Partnership Declaration and the Declaration on cooperation on Artificial Intelligence (AI). In addition, implementation of '*Indústria 4.0*' has progressed over the past year, with 60 out of the 64 measures initially announced having already been initiated<sup>8</sup>. For example, the first call under the (voucher-based) *Vale i4.0* initiative served to co-finance 340 projects to promote the adoption of digital technologies by SMEs and microenterprises. The second call foresees EUR 3.4 million worth of incentives. Eligible projects, which benefit from co-funding from EU funds, include those in areas such as cloud computing, cybersecurity, AI and advanced analytics, web content and customer relationship management, e-commerce and e-marketplaces, search engine optimisation and web analytics<sup>9</sup>. In the same vein, EUR 100 million have been made available for production projects or application of solutions within the scope of '*Indústria 4.0*' through a credit line as part of '*Capitalizar 2018*'.

The Portuguese authorities have produced tentative estimates of expected impact of '*Indústria 4.0*' so far: 4,200 jobs and EUR 700 million worth of additional exports (for approved incentives totalling EUR 380 million). These estimates suggest that continued efforts to promote decisive action to help Portuguese companies regardless of their size incorporate digital technologies into their business and production processes are likely to pay off.

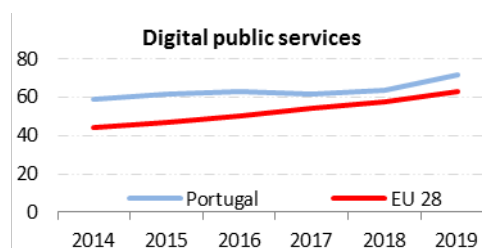
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<sup>8</sup> The second phase of '*Indústria 4.0*' was presented in April 2019.

<sup>9</sup> <https://www.iapmei.pt/getattachment/PRODUTOS-E-SERVICOS/Incentivos-Financiamento/Sistemas-de-Incentivos/Industria-4-0/GuiaIndustria40-pdf.pdf.aspx?lang=pt-PT>

## 5 Digital public services

5 Digital public services	Portugal		EU
	rank	score	score
DESI 2019	9	71.4	62.9
DESI 2018	9	63.7	57.9
DESI 2017	9	61.9	54.0



	Portugal		EU	
	DESI 2017 value	DESI 2018 value	DESI 2019 value	DESI 2019 rank
<b>5a1 e-Government users</b> % internet users needing to submit forms	58%	56%	70%	14
<b>5a2 Pre-filled forms</b> Score (0 to 100)	74	74	81	7
<b>5a3 Online service completion</b> Score (0 to 100)	96	98	99	2
<b>5a4 Digital public services for businesses</b> Score (0 to 100) - including domestic and cross-border	88	88	88	13
<b>5a5 Open data</b> % of maximum score	NA	NA	51%	23
<b>5b1 e-Health services</b> % individuals	NA	14%	14%	17
<b>5b2 Medical data exchange</b> % of general practitioners	NA	NA	63%	8
<b>5b3 e-Prescription</b> <sup>10</sup> % of general practitioners	NA	NA	NA	50%

Portugal has made significant progress over the past year in the dimension on Digital public services of DESI and remains among the EU's best performers in this area: it ranks 9<sup>th</sup> out of 28 Member States and shows an above-average overall score. Online interaction levels between internet users and public authorities increased significantly compared with 2017, and the country's performance is a long way above the EU average with regard to online service completion and the amount of data being pre-filled in public services' online forms. In contrast, there is room for improvement in areas such as open data use and availability of digital public services for businesses (where progress is flattening out)<sup>11</sup>. About 14 % of the country's citizens used e-health services (e.g. online consultations) in 2017, compared to an EU average of 18 %. 63 % of general practitioners, in turn, declared to exchange medical data online in 2018 (EU average 43 %).

<sup>10</sup> Data has been removed due to potential inconsistencies.

<sup>11</sup> [National authorities expect more public services for business to be available to other EU Member States soon, notably thanks to improved cross-border recognition systems.](#)

Portugal's Strategy for Public Administration's Digital Transformation, which runs until 2020, has three main axes: integration and interoperability; innovation and competitiveness, and resource sharing. It seeks to promote the use of ICT for administrative simplification and public service improvement. Increased e-government use is likely to be linked to Portugal's efforts to broaden its network of citizen spots, which provide access to, and support with online services (more than 500 of these spots are currently in operation, offering approximately 200 public services<sup>12</sup>), as well as to expand the use of the '*chave móvel digital*' (digital mobile key)<sup>13</sup>. In addition, the Portuguese public employment services recently introduced an online "one-stop shop" interface for job-seekers and employers (*IEFPonline*) allowing users to obtain full responses to their queries remotely. Although there are plans for effective inter-institutional connectivity and information sharing (the 2019 draft budget law envisages a new connection between employment and health services), some features such as the implementation of job integration agreements in areas like health, education or social action are still under development. Portugal's second annual e-health summit, one of Europe's largest events in this field, took place in Lisbon in March 2018. It signals Portugal's commitment to promoting e-health as part of the country's efforts to modernise public services. The 2019 edition of the Portugal eHealth Summit will be held in conjunction with the conference of the International Society for Telemedicine & eHealth (ISfTeH).<sup>14</sup>

Portugal is also making considerable efforts to promote digitally-enabled innovative approaches to public service provision. In October 2018, the Portuguese authorities presented 15 research projects designed to apply artificial intelligence and data science in the work of public administrations. EUR 3.8 million will be made available through the *Fundação para a Ciência e Tecnologia* (FCT) for these projects, which are part of Axis 5 of '*INCoDe.2030*' (*Research*) and will cover areas including health, education, culture, mobility and territorial management<sup>15</sup>. Moreover, in April 2018 Portugal's Administrative Administration Agency launched GovTech<sup>16</sup>, a contest for start-ups to present functional prototypes of products and services that help meet the United Nations' sustainable development goals.<sup>17</sup>

Portugal is adopting relevant measures to continue to modernise public services with the help of digital technologies and is one of the leaders in the EU in this regard. However, the relatively large share of the Portuguese population who do not use the internet or only seldom do so is, by definition, unlikely to benefit from the country's digital public services.

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<sup>12</sup> <https://www.ama.gov.pt/web/english/citizen-spot>

<sup>13</sup> <https://www.autenticacao.gov.pt/stats-chave-movel-digital>

<sup>14</sup> <https://ec.europa.eu/digital-single-market/en/news/conference-international-society-telemedicine-and-ehealth-portugal-ehealth-summit>

<sup>15</sup> For further details, please see <https://www.incode2030.gov.pt/en/featured/government-promotes-best-practice-applications-artificial-intelligence-public-administration>

<sup>16</sup> Further information including the list of winning projects available at <https://govtech.gov.pt/>

<sup>17</sup> This contest involves the use of blockchain technologies.