



Digital Economy and Society Index (DESI)

2019 Country Report

Bulgaria

About the DESI

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.*

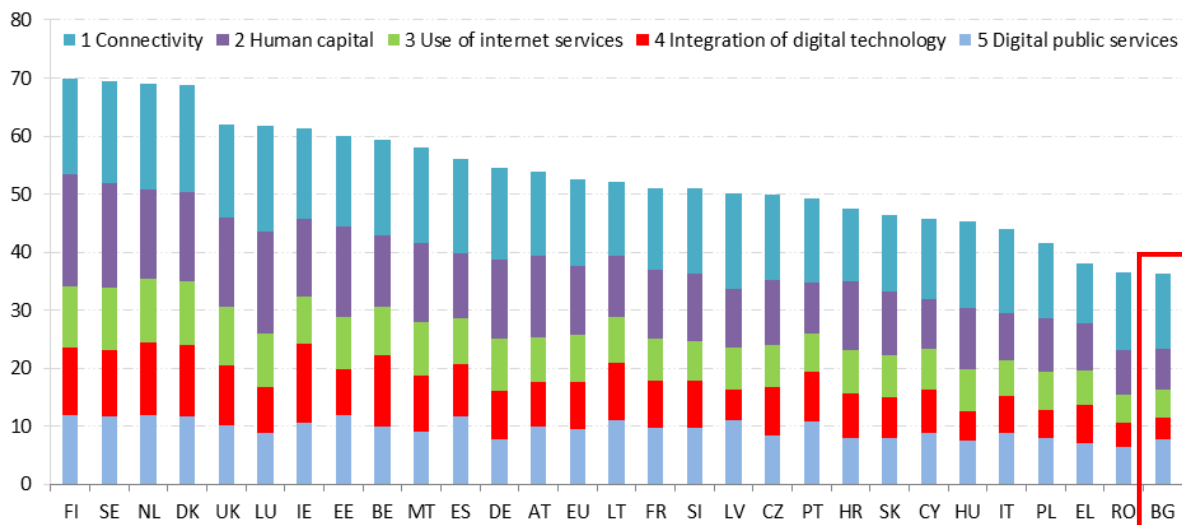
The DESI was re-calculated for all countries for previous years to reflect the above changes in the choice of indicators and corrections to the underlying data. Country scores and rankings may thus have changed compared with previous publications.

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

Bulgaria overview

	Bulgaria		EU
	rank	score	score
DESI 2019	28	36.2	52.5
DESI 2018	26	35.5	49.8
DESI 2017	27	32.4	46.9

Digital Economy and Society Index (DESI) 2019 ranking

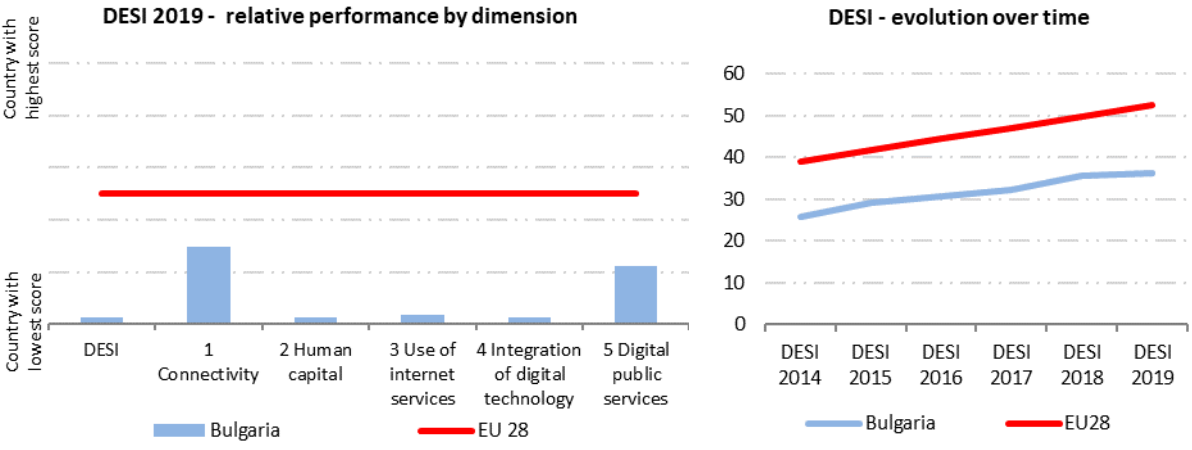


Bulgaria ranks 28th out of the 28 EU Member States in the European Commission Digital Economy and Society Index (DESI) 2019.

Despite an increase in its overall score, its rank decreased due to, on one hand, a limited performance in some of the DESI dimensions measured and, on the other hand, the increased performance of its EU peers in some the DESI indicators.

Bulgaria performs relatively well in connectivity, especially as regards the wide availability of ultrafast and mobile broadband networks. It has also made significant progress with the e-government dimension, with growing number of users and a high score for the provision of digital public services to businesses. However, Bulgaria scores well below the average in Human capital, its overall level of digital skills being among the EU's lowest. People with at least basic digital skills account for 29 % of the total Bulgarian population, against an EU average of 57 %. Only 11 % of people have skills that are above basic, which equals almost one third of the EU average. Bulgaria also performs well below the average in integrating digital technology. Companies are not yet taking full advantage of the possibilities offered by online commerce: 6 % of SMEs sell online (against the 17 % of the EU average), 3 % of total SMEs are selling cross-border and an only 2 % of their turnover comes from the online segment.

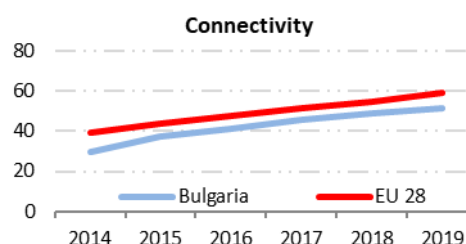
Bulgaria has a National Programme linked to the programming of EU structural funds called "Digital Bulgaria 2025"¹, which outlines some measures to improve of connectivity, public services and private sector integration of digital technologies. However, this is not an overarching strategy to support digital transformation in Bulgaria. A concept note for the Industry 4.0 strategy was elaborated in 2017 but it is still a draft.



¹ <https://www.mtict.government.bg/sites/default/files/uploads/it/putna-karta-15082018.pdf>

1 Connectivity

1 Connectivity	Bulgaria		EU
	rank	score	score
DESI 2019	25	51.6	59.3
DESI 2018	24	48.8	54.8
DESI 2017	21	45.9	51.2



	DESI 2017	Bulgaria		EU	
	value	DESI 2018	DESI 2019	rank	DESI 2019
1a1 Fixed broadband coverage % households	95%	95%	96%	19	97%
	2016	2017	2018		2018
1a2 Fixed broadband take-up % households	57%	59%	58%	28	77%
	2016	2017	2018		2018
1b1 4G coverage % households (average of operators)	66%	72%	80%	27	94%
	2016	2017	2018		2018
1b2 Mobile broadband take-up Subscriptions per 100 people	82	87	97	11	96
	2016	2017	2018		2018
1b3 5G readiness Assigned spectrum as a % of total harmonised 5G spectrum	NA	NA	0%	13	14%
			2018		2018
1c1 Fast broadband (NGA) coverage % households	74%	75%	75%	23	83%
	2016	2017	2018		2018
1c2 Fast broadband take-up % households	31%	39%	43%	15	41%
	2016	2017	2018		2018
1d1 Ultrafast broadband coverage % households	NA	75%	75%	15	60%
		2017	2018		2018
1d2 Ultrafast broadband take-up % households	5%	7%	10%	23	20%
	2016	2017	2018		2017
1e1 Broadband price index Score (0 to 100)	76	80	81	20	87
	2016	2017	2018		2017

Bulgaria ranks 25th in the Connectivity dimension of DESI 2019 (down one place from last year) despite a small increase in most connectivity indicators. At the end of 2018, the total coverage of fixed broadband networks rose by one percentage point to 96 % of households, slightly below the EU average of 97 %. Broadband take-up stands at 58 %. Despite an increase in 4G coverage by 8 percentage points to 80% of households, Bulgaria still needs to catch up by 14 % with the EU average. Nevertheless, take-up of mobile broadband has risen significantly (by 10 percentage points) to 97 %, slightly above the EU average of 96 %. While Bulgaria is close behind the EU average of 83 % of households covered by 30 Mbps NGA networks, at 75 %², it is remarkable that all the networks concerned are ultra-fast, putting the country significantly ahead of the EU average (60 %) in the latter, more future-oriented category. Moreover, take-up of fast broadband has risen considerably to 43 %, slightly exceeding the EU average of 41 %, although there is still a lag in the transition to ultrafast broadband subscriptions (10 % vs an EU average of 20 %), which would take advantage of

² NGA (FTTH, FTTB, VDSL, Cable DOCSIS 3.0 and other NGA) subscriptions as a percentage of total fixed broadband subscriptions.

the full capacity of the available networks. The fixed broadband price index³ is 81, below the EU average of 87, which represents higher prices per person, which might partly explain the low take-up.

Two years before the end of the national funding programmes under the National Broadband Plan (NBP) for 2014-2020, the execution rate reached only 47 %⁴. The delays seem to be attributable to the need for additional national financing and for certain legislative changes. Bulgaria plans a state aid notification for the main project to establish broadband access in remote, sparsely populated and rural areas. The sum of €30 million, funded under the EARDP, is earmarked for this project. The NBP's priorities already cover part of the gigabit connectivity goals. To complete the Plan, Bulgaria has started assessing the investment gap to be addressed, so as to fully align its core objectives. Thanks to the extensive dissemination of the WiFi4EU initiative, 246 municipalities (92.8 % of all those in the country) registered on the WiFi4EU portal. Moreover, 215 municipalities applied in response to the first call and 113 obtained a voucher for €15,000 each. The delayed first draft of the secondary legislation needed to ensure the effective implementation of the Broadband Cost Reduction Directive (BB CRD) is finally expected in the first half of 2019, while preparatory work is under way to update the mapping of existing infrastructure and quality of service.

In 2018, a national roadmap was adopted that details the steps needed to meet obligations as regards the use of the 700 MHz pioneer band for 5G. A large part of the 3.6 GHz band in Bulgaria is available and ready to be used for 5G services, but none has yet been assigned under technical conditions suitable for 5G. Operators are carrying out 5G tests, extending and updating their current networks to LTE Advanced. Bulgaria has already identified some potential candidates for 5G-enabled cities. In June 2018, a letter of intent was signed between Bulgaria, Greece and Serbia on preparing and conducting tests for cooperative, connected and automated driving across the three countries for the purposes of 5G deployment. To date, only 14 % of the total 2090 MHz of the EU-harmonised spectrum has been assigned in Bulgaria. This is because of delays in making available crucial spectrum below 1 GHz for electronic communication services, combined with the lack of commercial interest in other frequency bands. Despite some administrative and legislative advances, efforts to release all spectrum in the 800 MHz and 700 MHz bands have not yet yielded any results.

Together with its 5G strategy, which is soon to be incorporated in the National Broadband Plan, Bulgaria would gain by making sure that all EU-harmonised spectrum, including the 5G pioneer bands, is made available in good time to all relevant market players, to achieve the gigabit connectivity goals. An increased focus on deploying broadband in rural areas, combined with more training in digital skills and further development of digital services, would benefit the country's overall connectivity and help to bridge the digital divide, which is particularly challenging in light of factors like the predominantly aging population in rural depopulated areas. Additional measures could help boost demand, realise the NBP's objectives and use the earmarked funds in good time. There is still scope to reduce deployment costs and price levels.

³ The Broadband Price Index measures the prices of 12 representative broadband baskets as a percentage of household income. The baskets include three speed categories (12-30 Mbps, 30-100 Mbps and at least 100 Mbps) and four types of products (standalone internet, internet + TV, internet + fixed telephony and internet + TV + fixed telephony).

⁴ The total value of the planned financing is over €75 million.

Highlight 2019: Second place in the EU by the municipalities covered by the WiFi4EU initiative

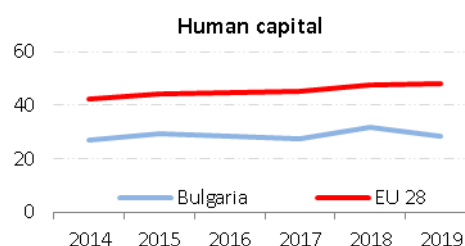
The WiFi4EU initiative promotes free access to Wi-Fi connectivity for citizens in public spaces including parks, squares, public buildings, libraries, health centres and museums in municipalities throughout Europe. With this initiative, municipalities can apply for vouchers to the value EUR 15,000, to be used to install Wi-Fi equipment in public spaces within the municipality that are not already equipped with a free Wi-Fi hotspot.

After the first competition held in November 2018, 43 % of Bulgarian municipalities have won vouchers for building high-speed wireless internet in public places. 215 applications have been submitted from Bulgaria and 113 municipalities have received funding totalling EUR 1,695,000.

The region with the highest percentage of financed municipalities (17 out of 35 municipalities) is the Northeastern, with 49 % of all municipalities receiving the vouchers. Second is the Southwest region with 46 % or 24 out of 52 municipalities funded. The third place is held by the North Central Region where 44 % of municipalities managed to join the initiative, which is 16 out of 36 municipalities. 14 of the district towns are among the top 113 municipalities to build high-speed wireless internet networks in public places.

2 Human capital

2 Human capital	Bulgaria		EU
	rank	score	score
DESI 2019	28	28.5	48.0
DESI 2018	27	31.7	47.6
DESI 2017	27	27.3	45.4



	Bulgaria		EU	
	DESI 2017 value	DESI 2018 value	DESI 2019 value	DESI 2019 rank
2a1 At least basic digital skills % individuals	26% 2016	29% 2017	29% 2017	27 2017
2a2 Above basic digital skills % individuals	10% 2016	11% 2017	11% 2017	27 2017
2a3 At least basic software skills % individuals	28% 2016	31% 2017	31% 2017	28 2017
2b1 ICT specialists % total employment	2.3% 2015	2.7% 2016	2.3% 2017	23 2017
2b2 Female ICT specialists % female employment	1.4% 2015	1.7% 2016	1.3% 2017	15 2017
2b3 ICT graduates % graduates	2.7% 2014	3.1% 2015	2.9% 2016	22 2015

As regards Human Capital, Bulgaria ranks 28th among EU countries, putting it well below the EU average. The overall level of digital skills is among the lowest in the EU: people with at least basic digital skills account for 29 % of the total, against an EU average of 57 %. This trend is confirmed among young people: 54 % of 16-24-year-olds have at least basic digital skills (against an EU average of 81 %). People with more advanced internet user skills (above basic digital skills) account for 11 % of the total, slightly less than a third of the EU average. Finally, the proportion of ICT specialists stood at 2.3 % of total employment in 2017. On a positive note, female ICT specialists are quite well represented, at 1.3 % of total female employment, in line with the EU average.

On the policy side, the education system is currently being reformed at all levels and although measures have not entirely kept pace with the scale of the digital transformation, there is an increased focus on improving levels of digital skills. For example, a revised school curriculum has been implemented and, from the 2018-2019 school year, computer modelling is being introduced in the third grade, while there are now more classes with IT profiles in upper secondary school⁵. In addition, extra-curricular activities are pursued in secondary schools (such as the national programme 'Education for IT careers'⁶). Performance-based funding will be introduced in vocational education and training (VET) to direct learners to vocational programmes, targeting occupations that are in short supply on the labour market. Financial incentives will be offered to VET schools that provide training for these occupations.

⁵ https://ec.europa.eu/education/resources-and-tools/document-library/education-and-training-monitor-2018-bulgaria-report_en

⁶ Highlight of DESI report (2018)

In the context of the higher-education reform, there are measures to step up cooperation between education institutions and businesses; the European Social Fund supports a project to bring university curricula more into line with labour market needs. The Government provides support for training in certain fields that have good results and also according to labour market needs (including STEM and ICT faculties). The number of students in ICT has risen slightly, though numbers remain low in science, mathematics, and physics.

A range of stakeholders are involved in various activities designed to develop digital skills, such as private companies providing free training in coding for schoolchildren or an online course in *cyberhygiene* developed in collaboration with the State E-government Agency. Another good example is the *Cyberscout* program, within which children educate other children on online safety and internet literacy. The Bulgarian Digital National Alliance⁷ continues to organise activities to develop digital skills among different segments of the population. In 2018, a good number of schools and other organisations took part in the EU Code Week⁸, a grassroots movement to encourage people of all age to code. Almost 600 events were held in Bulgaria, with an estimated number of over 30,000 participants.

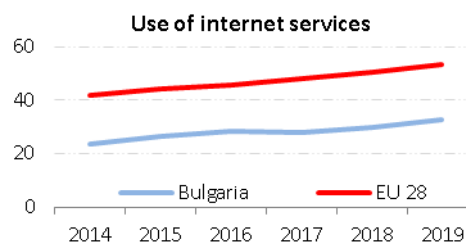
Despite ongoing efforts to tackle the low levels of digital skills, Bulgaria would benefit from an overarching digital skills strategy to address both the education system and the upskilling of the workforce.

⁷ <https://www.digitalalliance.bg/>

⁸ <https://codeweek.eu/>

3 Use of internet services

3 Use of internet services	Bulgaria		EU
	rank	score	score
DESI 2019	27	32.5	53.4
DESI 2018	27	29.9	50.7
DESI 2017	27	28.0	47.8

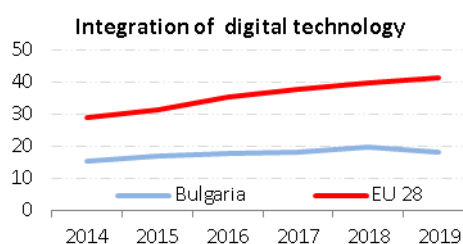


	DESI 2017	Bulgaria	DESI 2019	EU
	value	DESI 2018	value rank	DESI 2019
		value	value rank	value
3a1 People who never used the internet	33%	30%	27% 28	11%
% individuals	2016	2017	2018	2018
3a2 Internet users	58%	62%	64% 28	83%
% individuals	2016	2017	2018	2018
3b1 News	68%	74%	74% 20	72%
% internet users	2016	2017	2017	2017
3b2 Music, videos and games	64%	64%	64% 27	81%
% internet users	2016	2016	2018	2018
3b3 Video on demand	8%	8%	9% 27	31%
% internet users	2016	2016	2018	2018
3b4 Video calls	80%	85%	83% 1	49%
% internet users	2016	2017	2018	2018
3b5 Social networks	76%	79%	79% 7	65%
% internet users	2016	2017	2018	2018
3b6 Professional social networks	7%	3%	3% 28	15%
% internet users	2015	2017	2017	2017
3b7 Doing an online course	3%	3%	3% 28	9%
% internet users	2016	2017	2017	2017
3b8 Online consultations and voting	5%	4%	4% 26	10%
% internet users	2015	2017	2017	2017
3c1 Banking	7%	9%	11% 27	64%
% internet users	2016	2017	2018	2018
3c2 Shopping	27%	27%	31% 27	69%
% internet users	2016	2017	2018	2018
3c3 Selling online	11%	8%	13% 21	23%
% internet users	2016	2017	2018	2018

Despite an increase in its score, Bulgaria performs below average in terms of use of internet services: 64 % of people use the internet, against an EU average of 83 %, while 27 % have never used it - the highest value in the EU. Among internet users in the EU, Bulgarians make most video calls, and they are also well above the EU average when it comes to social network activities (79 % vs 65 %). In addition, 74 % of internet users read news online, which is more or less in line with the EU average. On the other hand, Bulgarian internet users are less keen to use other online services, in particular e-banking, which is used by only 11 % of internet users, against an EU average of 64 %. Online shopping, too, is used by only a third of internet users, against an EU average of 69 %.

4 Integration of digital technology

4 Integration of digital technology	Bulgaria		EU
	rank	score	score
DESI 2019	28	18.1	41.1
DESI 2018	28	19.5	39.6
DESI 2017	28	18.0	37.6



	Bulgaria		EU	
	DESI 2017 value	DESI 2018 value	DESI 2019 value	DESI 2019 rank
4a1 Electronic information sharing % enterprises	25%	23%	23%	25
4a2 Social media % enterprises	9%	9%	9%	28
4a3 Big data % enterprises	7%	7%	7%	25
4a4 Cloud % enterprises	5%	6%	6%	28
4b1 SMEs selling online % SMEs	5%	7%	6%	28
4b2 e-Commerce turnover % SME turnover	2%	4%	2%	28
4b3 Selling online cross-border % SMEs	3%	3%	3%	27

As regards integration of digital technology, Bulgaria ranks 28th among EU countries, well below the EU average. Bulgarian companies struggle to take advantage of the opportunities offered by online commerce: 6 % of SMEs sell online (against an EU average of 17 %), 3 % of all SMEs sell across borders, and only 2 % of their turnover comes from the online segment. Although Bulgarians use social media intensively for personal use, only 9 % of companies use it to promote their business, against an EU average of 21 %. Finally, the number of companies with a high-intensity index⁹ account only for 7.81 % of all companies. On a more positive note, 23 % of businesses share information online, against an EU average of 34 %.

Bulgaria has drafted a 'Concept note for the Digital Transformation of Bulgarian Industry (Industry 4.0)', which should form the basis for developing a Strategy 4.0. There is also a National Programme linked to the programming of the measures supported by the EU structural fund 'Digital Bulgaria 2025'¹⁰, which outlines some measures to encourage the digitisation of businesses. In this context, EU funds are being used to finance four centres of excellence and nine centres of competences, specialising in disciplines including mechatronics, clean technology and IT. In parallel, another EU-funded project will help set up regional innovation centres, which will encourage cooperation

⁹ [Digital Intensity Index](#), number of firms with high intensity rate, i.e. using from 7 to 9 technologies (on 12 technologies), being it from having a website, doing e-sales, sending e-invoices or purchasing cloud computing advanced services, among others (Digital Scoreboard 2019).

¹⁰ <https://www.mtict.government.bg/sites/default/files/uploads/it/putna-karta-15082018.pdf>

between businesses and research centres. These projects, expected to start in 2019, are designed to facilitate knowledge transfer, help create university spin-offs, and attract capital. These projects' sustainability and performance are vital for future investments, both in terms of infrastructure and soft measures. Meanwhile, the flagship Sofia Tech Park continues to face challenges. The underutilisation of its scientific infrastructure, governance issues and long-term financial sustainability are some of the concerns.

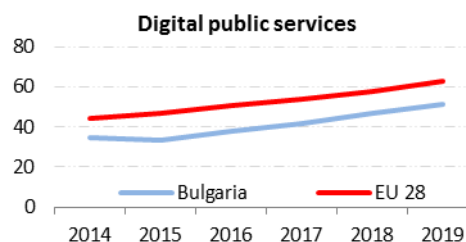
Another project managed by the Bulgarian SME promotion agency, planned to start in 2019, should set up a voucher scheme benefiting up to 450 SMEs in Bulgaria that are willing to acquire digital infrastructure.

Bulgaria is committed to investing strategically in digital technologies through EU-coordinated programmes (such as EuroHPC Joint Undertaking). It also has a National Centre for Supercomputing Applications, whose activities could be stepped up to benefit SMEs. Although Bulgaria is a signatory to the Declaration of Cooperation on Artificial Intelligence, measures to encourage the take-up of artificial intelligence applications in the public and private sector are lagging behind. Bulgaria's cybersecurity strategy, adopted in 2016, aims to combat cyber-crime, engage in international cooperation, establish an incident response capability and raise public awareness of cybersecurity risks. On this last point, cyberhygiene awareness-raising campaigns have been run in 2018 for children and business.

Although some measures are planned to support the take-up of digital technologies by business, the Bulgarian economy would benefit from an overarching strategy addressing digital transformation.

5 Digital public services

5 Digital public services	Bulgaria		EU
	rank	score	score
DESI 2019	25	51.5	62.9
DESI 2018	24	46.9	57.9
DESI 2017	25	41.8	54.0



	DESI 2017	Bulgaria		EU	
	value	DESI 2018 value	DESI 2019 value	DESI 2019 rank	DESI 2019 value
5a1 e-Government users % internet users needing to submit forms	57%	58%	61%	16	64%
	2016	2017	2018		2018
5a2 Pre-filled forms Score (0 to 100)	19	25	26	25	58
	2016	2017	2018		2018
5a3 Online service completion Score (0 to 100)	71	73	75	26	87
	2016	2017	2018		2018
5a4 Digital public services for businesses Score (0 to 100) - including domestic and cross-border	74	89	96	5	85
	2016	2017	2018		2018
5a5 Open data % of maximum score	NA	NA	66%	13	64%
			2018		2018
5b1 e-Health services % individuals	NA	10%	10%	23	18%
		2017	2017		2017
5b2 Medical data exchange % of general practitioners	NA	NA	20%	23	43%
			2018		2018
5b3 e-Prescription % of general practitioners	NA	NA	7%	26	50%
			2018		2018

As regards Digital Public Services, Bulgaria ranks 25th among EU countries, below the EU average. The country performs very well in the provision of digital public services to businesses; it has improved its performance since the previous year and now scores 96 out of 100, well above the EU average of 85. The number of e-government users has also increased since the previous year, with 61 % of internet users submitting forms online, almost in line with the EU average of 64 %. For e-health services, Bulgaria ranks 23rd in the EU, with 10 % of Bulgarians having used health and care services provided online. The e-prescription service is used by 7 % of general practitioners and 20 % of them exchange medical data.

Bulgaria has made significant progress with implementing its Strategy on the Development of e-government. The strategic framework is in place and the State e-Government Agency (SEGA) is operational and plays a key coordinating role. In the second half of 2017, the SEGA started developing an e-government architecture frame. The frame is a necessary and obligatory requirement for implementing the e-government policy, defined by standards, interoperability and network and information security. The Council of Ministers has recently given a mandate to the Chair of the SEGA to develop the general description of the e-government architecture and to ensure that the administrations responsible have access to the system.

Bulgaria's registry information exchange system, RegiX, is now operational, allowing administrations to access data contained in the registers and databases of other public sector services. However, the outdated legal framework remains the major obstacle to its widespread use. The provision of digital

public services for businesses has improved significantly. In 2018, it became compulsory for legal persons to submit their tax declarations online. This will be optional for natural persons (individuals) and will be incentivised via a tax rebate.

Important projects like the introduction of the new identity documents, with electronic identification and electronic signature are significantly delayed and have shown very little progress over the last year.

The National Health Strategy for 2014 - 2020 includes the introduction of a single integrated information system by developing electronic and mobile health as one of five main objectives. In this context, EU funds are being used to help complete a National Health Information System (NHSIS). This is designed to improve the quality and efficiency of healthcare, reduce the time needed to provide patients with healthcare, improve the quality of healthcare, and improve diagnosis and treatment through the use of new technologies in e-health. However, this project is also facing some delays in implementation.

Overcoming the delays in the reform process associated with implementing the strategy could contribute to significant improvements in digital public administration.