



Digital Economy and Society Index (DESI)

2019 Country Report

Hungary

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:

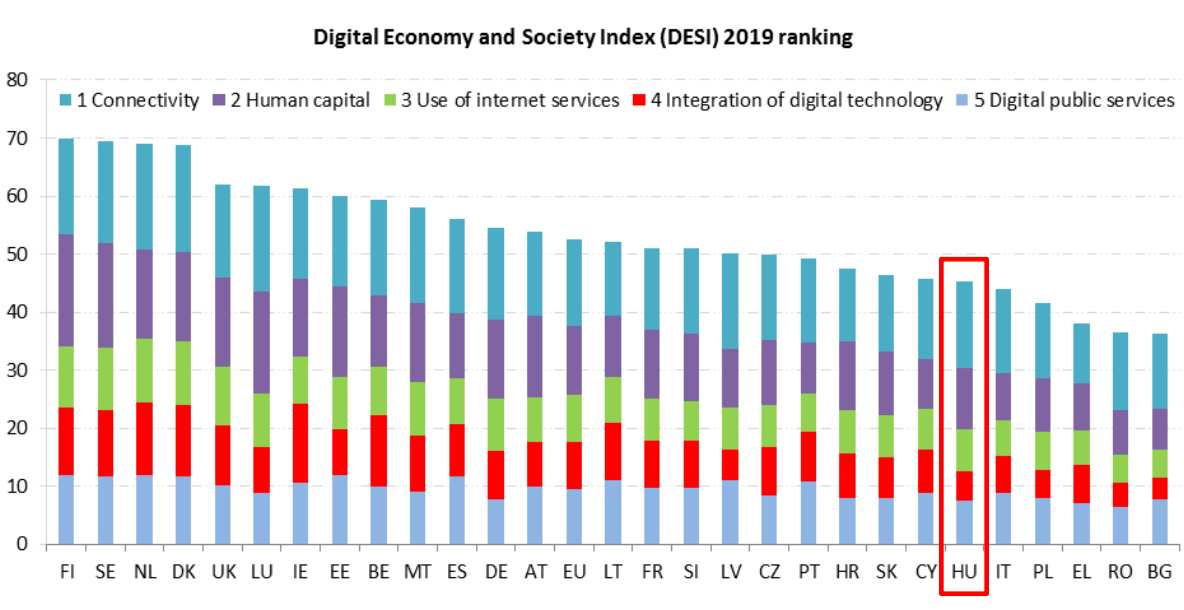
- *5G readiness,*
- *Above basic digital skills,*
- *At least basic software skills,*
- *Female ICT specialists,*
- *ICT graduates,*
- *People who never used the internet,*
- *Professional social networks,*
- *Doing an online course,*
- *Online consultations and voting,*
- *Individuals selling online,*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

Hungary overview

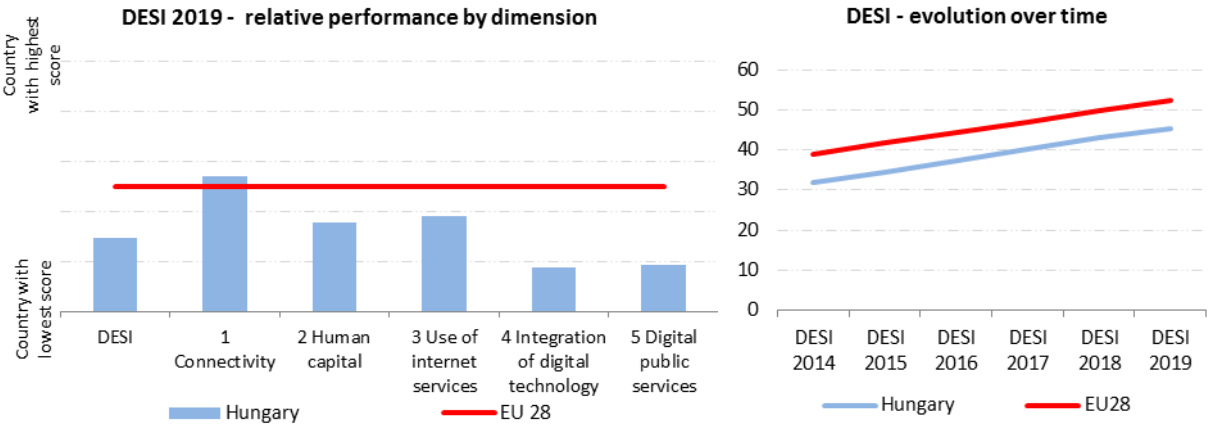
	Hungary		EU
	rank	score	score
DESI 2019	23	45.4	52.5
DESI 2018	23	43.2	49.8
DESI 2017	23	40.1	46.9



Hungary ranks 23rd out of 28 EU Member States in the Digital Economy and Society Index (DESI) 2019. Over the last few years, its score has increased in line with the EU average. However, Hungary has not managed to improve its position in the overall ranking.

Hungary performs best (slightly above the EU average) in the broadband Connectivity dimension, thanks to its widespread adoption of fast and ultrafast broadband and to its high coverage of next generation access (NGA) and ultrafast broadband infrastructure. The most challenging areas remain Digital public services and the Integration of digital technology in businesses. In both of these dimensions, Hungary scores well below the EU average, and it is among the worst performing Member States. The quality of e-government services is low and take-up is below average. Only 14 % of companies (the lowest share in the EU) use an enterprise resource planning software package to share information between different functional areas. The use of e-commerce, big data and cloud services shows a similar pattern. As regards Human capital, Hungary has a high proportion of ICT graduates and a close to average share of ICT specialists, though there is room for improvement as regards internet user skills.

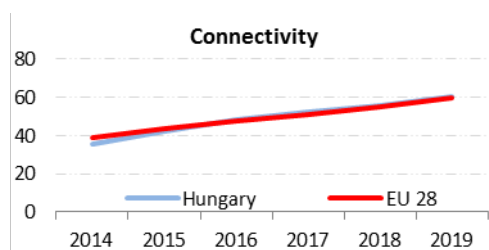
In 2014, Hungary adopted its National Info-communication Strategy 2014-2020¹. The implementation started in 2014, and was confirmed with the adoption of the Digital Success Programme (DJP) at the end of 2015 and the DJP 2.0 in 2016. In 2018, within the framework of the DJP, the government prepared the Digital Agricultural Strategy and the Digital Sports Strategy. In 2019, the country adopted its 5G strategy and it is planned to develop strategies on the Hungarian content industry, the health industry, artificial intelligence, fintech and blockchain. The implementation of several large-scale projects has continued. Examples include the Superfast Internet Programme, the Modern Enterprises Programme, the Support for Business Digital Development Programme and developments in e-government and e-health. On 31 October 2018, an Artificial Intelligence Coalition was established by 124 founders.



¹ http://www.kormany.hu/download/5/ff/70000/NIS_EN_clear.pdf

1 Connectivity

1 Connectivity	Hungary		EU
	rank	score	score
DESI 2019	14	60.4	59.3
DESI 2018	15	55.6	54.8
DESI 2017	15	51.9	51.2



	Hungary		EU	
	DESI 2017 value	DESI 2018 value	DESI 2019 value	DESI 2019 rank
1a1 Fixed broadband coverage % households	95%	95%	94%	21
1a2 Fixed broadband take-up % households	72%	78%	77%	11
1b1 4G coverage % households (average of operators)	92%	91%	96%	14
1b2 Mobile broadband take-up Subscriptions per 100 people	43	49	59	28
1b3 5G readiness Assigned spectrum as a % of total harmonised 5G spectrum	NA	NA	8%	12
1c1 Fast broadband (NGA) coverage % households	81%	83%	87%	15
1c2 Fast broadband take-up % households	40%	49%	58%	6
1d1 Ultrafast broadband coverage % households	NA	76%	82%	10
1d2 Ultrafast broadband take-up % households	22%	30%	40%	4
1e1 Broadband price index Score (0 to 100)	82	85	87	11

In connectivity, Hungary inched above the EU average, and now ranks 14th, after sustained relative improvement in recent years. Although fixed broadband coverage stagnated at around 94 % of homes, fast broadband coverage increased to 87 %. There is very strong platform-based competition illustrated by the stable technology share² of cable (49 %), the declining share of DSL (25 % against 27 % in 2017) and the rising share of FTTH/B (22 % against 20 % in 2017). While fixed broadband take-up stagnated (at 77 %, the EU average), the quality of the connection improved significantly. Well above half of homes subscribe to at least 30 Mbps (58 %), above the EU average of 41 %. In addition, Hungary continues to score well on ultrafast connectivity, mainly owing to its widespread cable networks: coverage stands at 82 % (60 % in the EU as a whole) and take-up at 40 %, following a 10 percentage point increase (20 % in the EU as a whole). Mobile broadband coverage also increased to above the EU average. However, despite significant improvement, mobile broadband take-up is still the lowest in the EU (59 subscriptions per 100 people, against 96 in the EU overall). This may be, because prices for mobile phone users are persistently among the highest in Europe. Despite the fall

² Data from July 2018

in mobile broadband prices for handset offers³ (from EUR 61.8 in 2017 to EUR 47.4 in 2018), these are more than double the EU average of €22.3. At the same time, the fixed broadband price index is very close to the EU average.

In 2016, the Superfast Internet Programme was launched. It started with a mapping exercise to identify areas where telecom operators are expected to make the full investment on their own. For areas that are not economically viable, a EUR 250 million state aid scheme has been developed to ensure broadband roll-out. The programme is co-funded by the European Structural Funds and by the Hungarian state, except for Budapest and its suburban area, for which only national resources will be used. The project intends to cover all Hungarian households with networks supplying at least 30 Mbps broadband internet service by 2023. The vast majority of projects under the Superfast Internet Programme deployed FTTH technology, enabling speeds in line with the gigabit society targets. The project deployment is reflected in the increase of rural FTTP coverage from 4 % in 2015 to 7 % in 2017 and 16 % in 2018. In 2018 from the initially foreseen ambitious coverage of 350,000 households 142,497 was realised.

In Hungary, 31 % of the 2090 MHz spectrum harmonised at EU level for wireless broadband has been assigned. The 5G Coalition (5GC), initiated by the Digital Success Programme, was formed with the aim of making Hungary a major European centre of 5G developments and taking a leading role in the region in testing 5G-based applications. Based on its proposals, the 5G strategy was adopted at the beginning of 2019 by the Hungarian Government. Hungary comes in 12th on the 5G readiness indicator, as, by the end of 2018, it had assigned spectrum in the 3.4- 3.6 GHz band in accordance with Commission Decision (EU) 2019/235, and the spectrum is available for use for 5G by 2020. A multi-band award process is being prepared for 2019. The targeted bands are the 5G pioneer bands, namely the 700 MHz and 3400-3800 MHz bands and remaining spectrum in the 2100 MHz and 2600 MHz bands. Assignment of the 26 GHz band is not yet envisaged. The Hungarian National Regulatory Authority, NMHH, held an RSPG⁴ peer review workshop in view of the planned auction in December 2018.

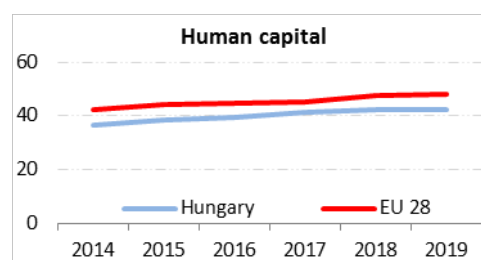
While significant advancements have been achieved in fixed broadband coverage through the Superfast Internet Programme, mobile network coverage and take-up are not improving at the required pace. The multi-band auction scheduled for 2019 will play a key role in the deployment of 5G in Hungary.

³ Offers including 1 GB, 300 calls and 225 SMS. Source: Mobile Broadband Price Study (Van Dijk and Empirica). Prices expressed in EUR/PPP, VAT included. Data as of February 2018.

⁴ Radio Spectrum Policy Group.

2 Human capital

2 Human capital	Hungary		EU
	rank	score	score
DESI 2019	20	42.1	48.0
DESI 2018	19	42.5	47.6
DESI 2017	18	41.2	45.4



	DESI 2017	Hungary		EU	
	value	DESI 2018	DESI 2019	rank	DESI 2019
2a1 At least basic digital skills % individuals	51%	50%	50%	21	57%
2a2 Above basic digital skills % individuals	24%	26%	26%	21	31%
2a3 At least basic software skills % individuals	54%	52%	52%	22	60%
2b1 ICT specialists % total employment	3.6%	3.6%	3.6%	15	3.7%
2b2 Female ICT specialists % female employment	0.9%	1.0%	0.7%	26	1.4%
2b3 ICT graduates % graduates	3.1%	NA	4.3%	11	3.5%

In the Human capital dimension, Hungary ranks 20th among EU countries and below the EU average, with no significant changes since last year. Basic digital skills remain below the EU average (Hungary ranks 21st out of 28), basic software skills are also modest (22nd out of 28). Only half of people aged between 16 and 74 have basic digital skills (57 % in the EU as a whole). 26 % of the population has advanced internet user skills, which puts Hungary in 21st place in the ranking. ICT specialists account for a similar proportion of the workforce as in the rest of the EU (3.6 % against 3.7 % in the EU). As regards ICT graduates, Hungary exceeds the EU average at 4.3 %. The number of female ICT specialists is still low, less than 1 % of all female employees.

The Digital Education Strategy remains the main blueprint for developing digital skills at all levels of public education. Hungary has set up a Digital Pedagogical Methodology Centre (DPMK) to support the implementation of the strategy. The Digital Workforce Programme has been published and it gives the National Digital Skills Councils an important role in providing support and expertise. A new national curriculum is being prepared, which will reflect the importance of digital skills. EU funds are widely used to provide the necessary infrastructure and access. They are also used to support the development of digital skills in both the inactive and the working population, to narrow the skills gap and to boost the inclusion of disadvantaged people.

One of the core goals of the government's digital skills strategy is to give the digitally illiterate opportunities to familiarise themselves with computers. By the end of 2018, 1500 community digital access points (Digital Success Programme Points) were established across the country. More than 1500 Digital Success Programme mentors have also been trained, to provide the necessary support

and help at the community access points. These measures have also been coupled with programmes to include senior citizens in the digital world, by teaching them the necessary basic digital skills.

The lack of ICT professionals in the job market remains a significant issue in Hungary and the Digital Workforce Programme as well as multiple EU funded programmes aims to tackle this issue. Moreover, several universities and research institutes are among the founding members of the Hungarian Artificial Intelligence Coalition. All of them are involved directly or indirectly in activities associated with educational and training projects linked to AI research, development and application.

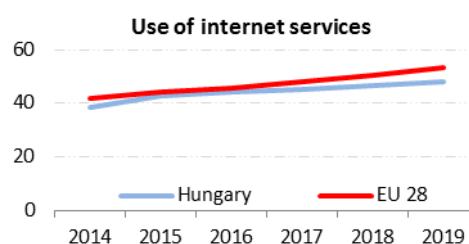
The 'Programme your Future' project also focuses on the younger generation of women to make ICT-related jobs and careers in the ICT sector more attractive to them, and to raise the percentage of women in IT higher education.

The National Coalition for Digital Skills and Jobs – which includes members from several ministries, public organisations, academia and the private sector - was very active in 2018. It contributed to the launch of the abovementioned Digital Pedagogical Methodology Centre and the Digital Workforce Programme, and to promoting digital skills through various events and projects. Cooperation among public authorities and between the public and private sector on the promotion of digital skills and jobs is very positive. This is especially true of projects that promote gender balance in ICT education and the acquisition of digital skills. 817 schools participated in EU Code Week in 2018. The government aims to increase this to 50 % of all schools by 2020.

Although not yet reflected in the current DESI value and ranking, Hungary continued to implement the various national strategies designed to tackle the issues related to digital skills. These efforts address all the main facets of the digital skills gap – including the goal of increasing the percentage of women in ICT. In 2018, the implementation of these initiatives progressed and in several cases has been completed. Hungary has actively participated in relevant EU initiatives. Good cooperation has been maintained among the government and relevant stakeholders. Citizens' interest in these initiatives has remained high.

3 Use of internet services

3 Use of internet services	Hungary		EU
	rank	score	score
DESI 2019	18	48.0	53.4
DESI 2018	17	46.5	50.7
DESI 2017	14	45.4	47.8



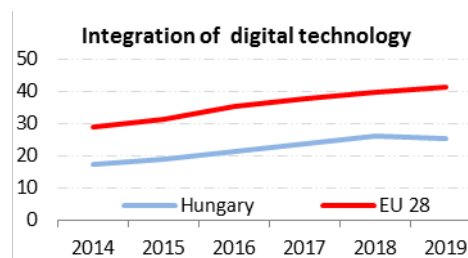
	Hungary		EU	
	DESI 2017 value	DESI 2018 value	DESI 2019 value	DESI 2019 rank
3a1 People who never used the internet % individuals	19%	17%	16%	19
3a2 Internet users % individuals	78%	76%	75%	21
3b1 News % internet users	88%	85%	85%	10
3b2 Music, videos and games % internet users	81%	81%	82%	14
3b3 Video on demand % internet users	8%	8%	11%	23
3b4 Video calls % internet users	54%	59%	60%	9
3b5 Social networks % internet users	83%	84%	86%	2
3b6 Professional social networks % internet users	15%	16%	16%	14
3b7 Doing an online course % internet users	5%	5%	5%	21
3b8 Online consultations and voting % internet users	3%	4%	4%	24
3c1 Banking % internet users	44%	49%	54%	20
3c2 Shopping % internet users	48%	49%	52%	21
3c3 Selling online % internet users	14%	14%	14%	19

Overall, Hungary ranks 18th in the Use of internet by citizens, below the EU average. 75 % of the population use the internet at least once a week, compared with 83 % in the EU as a whole. 86 % use social networks, the second highest score in the EU; 85 % read news online (72 % in the EU), and 60 % make video calls (49 % in the EU). On the other hand, only 5 % of the population engaged in e-learning activities and 4 % in online consultations and voting.

Online banking and shopping have become more popular. 54 % of people have used banking services online, up from 44 % two years ago. In 2018, 52 % of the population shopped online, 4 percentage points more than in 2016. In the overall use of both of these services, however, Hungary is still below the EU average.

4 Integration of digital technology

4 Integration of digital technology	Hungary		EU
	rank	score	score
DESI 2019	25	25.4	41.1
DESI 2018	24	26.2	39.6
DESI 2017	24	23.7	37.6



	DESI 2017	Hungary		EU	
	value	DESI 2018	DESI 2019	rank	DESI 2019
4a1 Electronic information sharing	16%	14%	14%	28	34%
% enterprises	2015	2017	2017		2017
4a2 Social media	13%	15%	15%	22	21%
% enterprises	2016	2017	2017		2017
4a3 Big data	7%	7%	6%	27	12%
% enterprises	2016	2016	2018		2018
4a4 Cloud	8%	11%	11%	22	18%
% enterprises	2016	2017	2018		2018
4b1 SMEs selling online	12%	12%	12%	21	17%
% SMEs	2016	2017	2018		2018
4b2 e-Commerce turnover	8%	10%	9%	17	10%
% SME turnover	2016	2017	2018		2018
4b3 Selling online cross-border	4%	5%	5%	24	8%
% SMEs	2015	2017	2017		2017

Hungary is among the worst performing EU Member States in the Integration of digital technology in businesses. Uptake of ICTs is low across all the indicators measured in this dimension. Hungary has the lowest share of enterprises sharing information electronically in the EU. Only 7 % of companies rely on big data solutions (12 % in the EU), 11 % use cloud computing (18 % in the EU) and 15 % has social media activities on at least two channels (21 % in the EU). Despite the increased demand in online shopping, the percentage of SMEs selling online did not increase in 2018, and remained well below the EU average. According to the Digital Intensity Index⁵, 55 % of companies in Hungary has a very low level of digitisation (46 % in the EU), and only 15 % are highly digitised (18 % in the EU).

Many entrepreneurs still see the need to go digital as a burden, rather than as a means to become more competitive. The government aims to change this perception and convince SMEs to get rid of their distrust of digital technologies. In the Modern Enterprises Programme, there is a large focus on awareness-raising activities. Around 9,000 company audits have taken place, 174 events have been organised, a digital knowledge base has been prepared and a nationwide communication campaign has been launched as part of the programme. In addition, a supplier partnership network has been set up to serve SMEs with IT solutions. Businesses have the possibility to obtain the Digitally Qualified

⁵ Source: Digital scoreboard 2019, <https://ec.europa.eu/digital-single-market/en/digital-scoreboard>

Enterprise classification, which allows them to acquire non-refundable additional financial support from certain EDIOP (Economic Development and Innovation Operational Programme) tenders.

The least digitally developed sectors are agriculture, construction, tourism and the food and beverages industry. All these sectors play a key role in the Hungarian economy. A specific emphasis is put on digitising SMEs in these sectors through the development of specific sectoral strategies.

Hungary is committed to the advancement of new digital technologies and to investing strategically in digital technologies in this area through EU-coordinated programmes. The country is a member of the EuroHPC Joint Undertaking and has also signed the Declaration on Cooperation on Artificial Intelligence.

To boost the digital transformation of the Hungarian economy, it is important for the government to continue carrying out the awareness-raising and funding programmes that target SMEs.

Highlight 2019: Artificial Intelligence Coalition

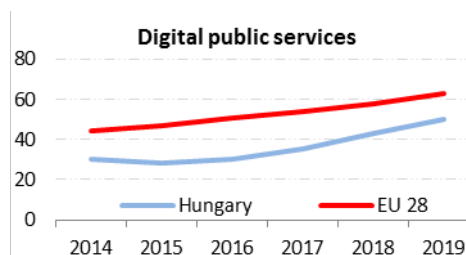
In October 2018, the Minister of Innovation and Technology initiated the foundation of the national Artificial Intelligence Coalition. The coalition has 124 founding members including representatives of all relevant stakeholders along the entire value chain, including researchers, developers and users. It represents stakeholders of all sizes and types as well, from start-ups and SMEs to large multinational corporations, research organizations, academia, state representatives and other bodies.

The coalition has the following specific goals:

- provide a constant professional and cooperation forum for AI developers, the market and state participants representing the AI user side, as well as the academic and professional organisations;
- develop a Hungarian AI Strategy, with the aid of which the AI-based technology development and its application will be able to achieve results in a favourable economic and regulatory environment;
- analyse the social and economic impacts related to the spread of AI.

5 Digital public services

5 Digital public services	Hungary		EU
	rank	score	score
DESI 2019	26	49.8	62.9
DESI 2018	26	42.8	57.9
DESI 2017	27	35.0	54.0



	Hungary		EU	
	DESI 2017	DESI 2018	DESI 2019	DESI 2019
	value	value	value	rank
5a1 e-Government users % internet users needing to submit forms	38%	45%	53%	20
	2016	2017	2018	2018
5a2 Pre-filled forms Score (0 to 100)	23	28	31	23
	2016	2017	2018	2018
5a3 Online service completion Score (0 to 100)	63	75	82	22
	2016	2017	2018	2018
5a4 Digital public services for businesses Score (0 to 100) - including domestic and cross-border	68	73	77	24
	2016	2017	2018	2018
5a5 Open data % of maximum score	NA	NA	NA	64%
			2018	2018
5b1 e-Health services % individuals	NA	7%	7%	26
		2017	2017	2017
5b2 Medical data exchange % of general practitioners	NA	NA	28%	15
			2018	2018
5b3 e-Prescription % of general practitioners	NA	NA	69%	14
			2018	2018

Digital public services remain one of the most challenging areas of a digital economy and society. In this dimension of the DESI Hungary ranks 26th out of 28 EU Member States, despite progress in the provision and the use of e-government services. It ranks 23rd in the re-use of information across administrations to make life easier for citizens (Pre-filled forms) and 22nd in the sophistication of services (Online service completion). Since 2016, e-government users have increased substantially, from 38 % to 53 %, although this is still below the EU average of 64 %. As for e-health, where the results of the latest policy developments cannot yet be tracked, Hungary performs well on the use of electronic prescriptions. As of March 2017, however, the use of e-health services by citizens was low.

The e-Administration Act (Act No. CCXXII of 2015) entered into force in January 2018, giving citizens and businesses alike the option to interact digitally with the public administration. The act obliges almost all public administration bodies, as well as other institutions such as courts and public prosecutor offices, to provide electronic channels for those services where one's physical presence is not required by law. For businesses the use of the online channel is mandatory.

To support the implementation of such services, the authentic digital mailbox and the e-delivery service have been renewed for both citizens and public administration offices, and a new e-delivery service has been launched for businesses (Company Gate). Furthermore, a new customizable e-

government point of single contact portal (*SZÜF - szuf.magyarorszag.hu*) has been set up as a new common platform for e-government service provision.

As for the background infrastructure, in January 2018, the Central Governmental Service Bus, a technical interoperability platform was launched to improve the automatic data exchange between services and base registries. The digitisation of local government has been enhanced with the expansion of the central Municipality ASP services, covering 100 % of municipalities as of January 2019.

Having the legal framework and the underlying infrastructure in place, it is now important to assess the user-friendliness of the service provision, to increase the use of the online channel.

As for e-health, the new nationwide e-health platform (EESZT) was launched in November 2017. By December 2017, about 3000 pharmacies joined the platform, followed by all hospitals in 2018. Currently, about 85 % of general practitioners and outpatient institutes are also connected. The platform manages e-prescriptions, which represent over 70 % of all prescriptions. The challenge is to boost the use of the platform by the parties involved, including citizens.