



DIGITAL COMPETITIVENESS INDICATORS AND THE E-GOVERNMENT PROCESS IN ROMANIA

Dorin Lixăndroiu

Transilvania University of Brasov (Romania)

lix.i.d@unitbv.ro

Abstract: *The article showcases the results in Romania for the following indicators: Digital Economy and Society Index (EU28 DESI) defined for the countries in the European Union, International Digital Economy and Society Index (I-DESI), an extension of the UE28 DESI index, E-Government Development Index (EGDI), Human Capital Index (HCI) and IMD World Competitiveness Yearbook. Based on these indicators, an analysis of the e-government process is performed.*

JEL classification: O11, O15, O38

Key words: e-government, DESI, I-DESI, EGDI, HCI, OECD, IMD World Competitiveness Yearbook

1. INTRODUCTION

The concept of e-government represents the use of digital technologies as an integral part of government. The stakeholders in the e-government process are as follows: government agencies, NGOs, the business environment and the citizens. The e-government process implies access to data, information and services with the help of information technologies, the participation in the decision making process in a transparent and efficient manner and implicitly an increase in government responsibility.

The analysis and rankings carried out on the basis of statistical data at country level are based on composite statistic indicators, for which potential weight systems are attributed. Thus, the matter can be analyzed by means of various indicators, such as: *Digital Economy and Society Index (EU28 DESI)* defined for member countries of the European Union, *International Digital Economy and Society Index (I-DESI)*, an extension of the UE28 DESI index, *E-*



Government Development Index (EGDI), Human Capital Index (HCI), IMD World Competitiveness Yearbook.

An important result for defining composite indicators belongs to the Romanian academic Gheorghe Păun, who states and demonstrates, with the help of the Impossibility Theorem for Indicators Aggregation, that no indicator can be created that is at the same time aggregated and sensitive, anti-catastrophic and non-compensatory¹. The theorem demonstration indicates that any composite indicator which is sensitive and anti-catastrophic is compensatory.

Thus, the analysis of a composite indicator must also take into consideration the values of the indicators on the basis of which it was defined. The composite indicators presented are composed of a large number of sub-indicators which are entered weighted in the final formula. In this manner, the non-compensatory nature of the composite indicator is diminished.

2. DIGITAL ECONOMY AND SOCIETY INDEX (EU28 DESI)

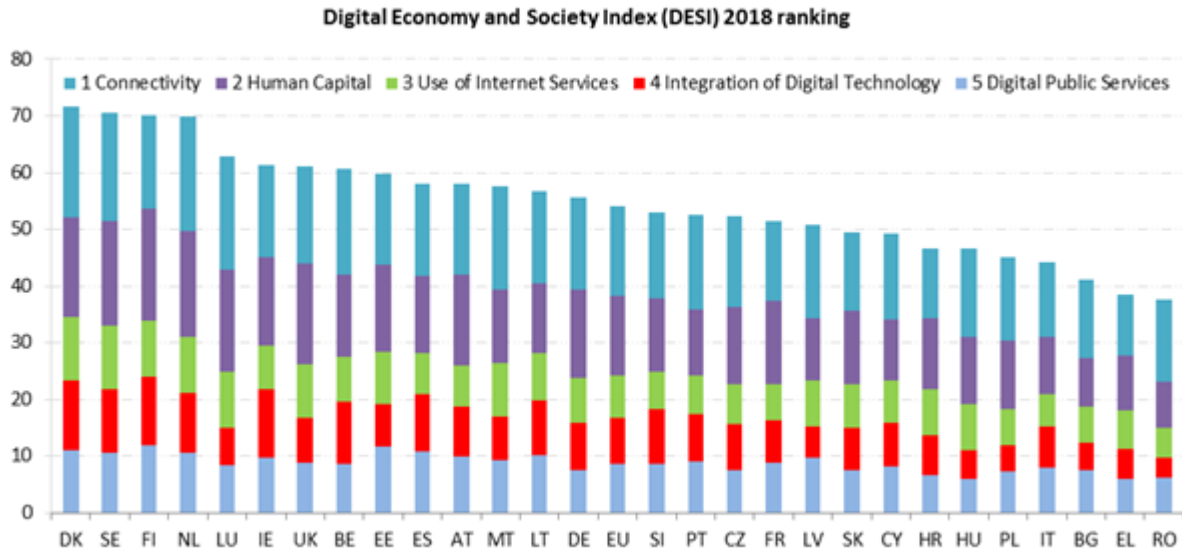
The Digital Economy and Society Index is a composite indicator relating to the information society which measures digital performance and tracks the evolution of the EU member states in terms of digital competitiveness². *DESI* was first calculated in 2014 using statistic data from 2013 and it represents an important analytical instrument for the comparative analysis of digital development in EU member states. *DESI* allows the identification of areas which require priority investments needed to create a genuine single digital market.

The *DESI* index is composed of five main dimensions which in turn encompass sub-dimensions (in total, a number of 34 sub-dimensions). The main dimensions are: *Connectivity, Human Capital, Use of Internet Services, Integration of Digital Technology and Digital Public Services.*

¹ Păun Ghe. (1983) *An Impossibility Theorem for Indicators Aggregation*, Fuzzy Sets and Systems, Vol.9, No.2, pp.205-210

² <https://ec.europa.eu/digital-single-market/en/desi>

Figure 1



Source: <https://ec.europa.eu/digital-single-market/en/desi>

Romania is in the last place among the 28 EU member states according to DESI 2018. It is part of the low performance group of states along with Greece, Bulgaria, Italy, Poland and Hungary which occupy, in order, positions 27 through 23.

The following figure indicates the status in relation to the year 2017.

Figure 2

	Romania		UE
	Rank	Score	Score
DESI 2018	28	37.5	54.0
DESI 2017	28	33.7	50.8

Source: <https://ec.europa.eu/digital-single-market/en/desi>

Romania’s evolution per each dimension is illustrated in Figure 3.

Figure 3

Dimensions	2017 Rank	2018 Rank
Connectivity	26	22
Human Capital	28	28
Use of Internet Services	28	28
Integration of Digital Technology	28	28
Digital Public Services	26	26

Source: processing from <https://ec.europa.eu/digital-single-market/en/desi>



In terms of DESI 2018, Romania maintains the same 28th place as in 2017. Its score has increased due to an improvement in performance for four out of five dimensions, however the progress recorded in the previous year has been slow, Romania not managing to compensate for the performance gaps. The compensatory nature of the *connectivity* indicator is evident, which contributes to the increase in the *DESI* composite indicator for Romania.

International Digital Economy and Society Index (I-DESI)

In the final European Commission report entitled *International Digital Economy and Society Index 2018 SMART 2017/0052*³ it is stated that the *International Digital Economy and Society Index (I-DESI)* reflects and extends the *EU28 DESI index* of the digital economy and information society in order to allow the analysis of trends and the comparison of the digital performance in 45 countries (28 EU member states and, in addition to these, Australia, Brazil, Canada, Chile, China, Iceland, Israel, Japan, Mexico, New Zealand, Norway, Russia, Serbia, South Korea, Switzerland, Turkey and the United States).

The *I-DESI* 2018 model uses sets of data for a four year period starting from 2013 up to 2016 in order to provide the analysis of trends. It encompasses a set of relevant indicators, similar to the current mix of *DESI* digital policies for EU28.

The formula for calculating the *I-DESI* for country X, with a defined weights system, is⁴:

$$\begin{aligned} I-DESI_{\text{Country X}} = & 0.25 \times \text{Connectivity}_{\text{Country X}} + 0.25 \times \text{Human Capital}_{\text{Country X}} + \\ & 0.15 \times \text{Use of Internet}_{\text{Country X}} + 0.2 \times \text{Integration of Digital Technology}_{\text{Country X}} + \\ & 0.15 \times \text{Digital Public Services}_{\text{Country X}} \end{aligned}$$

The analysis of the *I-DESI* indicator will help countries identify the fields in which investment efforts need to be focused in order to reach the levels of the highest performing states. Correlation and covariance tests carried out between the indicators *SESI* and *I-DESI* for the time interval 2013-2016 have lead to a correlation coefficient of 0.94.

³ <http://news.ucamere.net/StudyInternationalDigitalEconomyandSocietyIndex2018.pdf>

⁴ *Ibidem*



The normalized scores for the two groups of states analyzed (EU 28 and NonEU17) are the following:

Figure 4

	2013	2014	2015	2016
EU28 avg	0.51	0.53	0.56	0.59
Non Eu17 avg	0.50	0.53	0.56	0.59

Source: processing from *International Digital Economy and Society Index 2018*
<http://news.ucamere.net/StudyInternationalDigitalEconomyandSocietyIndex2018.pdf>

Table 1 shows an extract of the ranking of normalized scores for the *I-DESI index* in a decreasing order of the values recorded in 2016.

Table 1

		2013	2014	2015	2016
1	Denmark	0.68	0.68	0.71	0.76
2	South Korea	0.60	0.62	0.65	0.75
3	Finland	0.65	0.66	0.72	0.74

32	Serbia	0.28	0.31	0.40	0.50

42	Romania	0.34	0.36	0.42	0.44
43	Mexico	0.33	0.33	0.38	0.43
44	Turkey	0.32	0.33	0.38	0.42
45	Brazil	0.34	0.34	0.38	0.40

Source: processing from *International Digital Economy and Society Index 2018*
<http://news.ucamere.net/StudyInternationalDigitalEconomyandSocietyIndex2018.pdf>

The significant progress recorded by Serbia can be noticed, the country managing, over a period of four years, to significantly decrease the gap recorded in 2013 and thus reach the 32nd place within the 45 country ranking.

With regard to the *Digital Public Services Dimension*, Romania, for the year 2016, was in the next to last place of the 45 countries analyzed, with a normalized score of 0.39, outranking only Slovakia, with a score of 0.38.



3. E-GOVERNMENT DEVELOPMENT INDEX (EGDI)

To measure the development of national e-government capacities, the United Nations has generated the United Nations e-government development index (EGDI). The EGDI is a composite indicator that consists of three indices (online service index, telecommunication index and human capital index) that are equally weighted.

The three indices which make up the *EGDI* composite indicator cover a large range of topics relevant to e-government⁵:

- The *online service index* measures the government’s capacity and desire to provide online services and to communicate with its citizens using electronic means of communication.
- The *telecommunications infrastructure index* measures the existing infrastructure needed by the citizens in order to participate in e-government.
- The *human capital index* is used to measure the citizens’ ability to use the electronic government services.

All indices used in evaluating the *EGDI* include several components with various weights. The mathematical development of the structure of these indices is explained in the *United Nations E-Government Survey 2018 - Annexes*⁶.

Romania’s position in the decreasing ranking of countries depending on the value of the *E-Government Development Index (EGDI)* is shown in figure 5.

Figure 5

	2010	2012	2014	2016	2018
<i>EGDI Rank</i>	47	62	64	75	67

Sources: <https://www.oecd.org/gov/public-governance-review-scan-romania.pdf>
https://publicadministration.un.org/egovkb/portals/egovkb/documents/un/2018-survey/e-government%20survey%202018_final%20for%20web.pdf

⁵ <http://www.cesifo-group.de/DocDL/dicereport412-db2.pdf>

⁶ https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2018-Survey/E-Government%20Survey%202018_Annexes.pdf



For the year 2018, the value of the EGDI indicator for Romania is 0.6671, the lowest of all European Union member states⁷.

The first position in this ranking of all the 193 countries analyzed in 2018, belongs to Denmark with a value of the EGDI indicator of 0.9150.

The Organization for Economic Co-operation and Development (OECD) is an intergovernmental organization founded in 1961 and which has 36 member states. Its purpose is to identify, disseminate and evaluate the implementation of public policies for ensuring sustainable economic growth and social stability. Key partners of the organization are Brazil, India, China, Indonesia and South Africa. With these countries OECD represents 80% of the global exchanges and investments, which gives the organization a central role in meeting the challenges faced by the global economy.

OECD's activity mainly focuses in four priority directions by promoting structural reforms which ensure combating of inequalities and a sustainable development:

- streamlining the mechanisms for creating a functional market economy;
- improvement and consolidation of national fiscal policies;
- promoting innovation in economy;
- capitalizing the human resource.

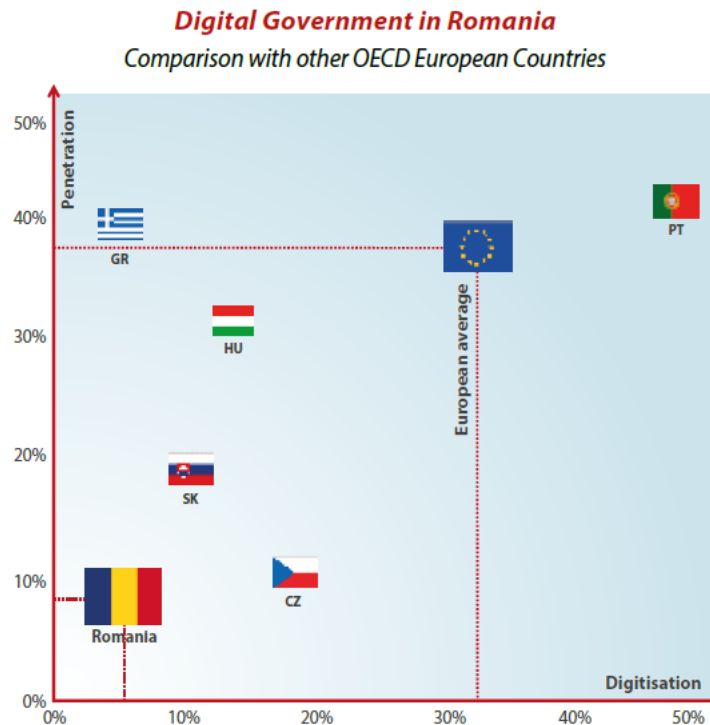
Among the fields monitored by the *OECD*, an important role is held by *Digital Government*. Other fields include: *The Center of Government, The Strategic Management of human resources, Budgetary governance, and Open government*.

In the *OECD Public Governance Reviews – Romania 2016*⁸, a graphic representation is displayed (figure 6) of the status of digital government in Romania in comparison to other European Union states, members of OECD.

⁷ https://publicadministration.un.org/egovkb/portals/egovkb/documents/un/2018-survey/e-government%20survey%202018_final%20for%20web.pdf

⁸ <https://www.oecd.org/gov/public-governance-review-scan-romania.pdf>

Figure 6



Source: Based on the European eGovernment Benchmark 2016;
<https://ec.europa.eu/digital-single-market/en/news/eu-egovernment-report-2016-shows-online-public-services-improved-unevenly>.

Starting with the year 2004, the issue of Romania's adhesion to the *Organization for Economic Co-operation and Development* becomes a strategic objective of the external policy. On April 5th 2018, Romania became a member in *OECD's Development Assistance Committee (DAC)*.

DAC, as main forum for the providers of cooperation for humanitarian development and assistance, represents an important platform for exchange of experience between the member states⁹.

4. THE HUMAN CAPITAL INDEX (HCI)

The human capital represents a central factor for sustainable development and diminishing of poverty. The economic benefits of investments in human capital are not rapidly visible. Due to this fact, policy makers do not always consider a priority the investment in human capital.

⁹ <http://www.oecd.org/countries/romania/romania-participant-dac.htm>



In response to the risks associated with underinvestments in the human capital, the World Bank Group launched the *Human Capital Project (HCP)*¹⁰. An important element of this project is designing a metric in order to assess a country's human capital.

The Human Capital Index (HCI) is designed to assess the quantum of human capital a new-born child would reach after turning 18¹¹.

The index measures the human capital of the next generation, defined as being the value of the human capital that a new-born child may reach, taking into consideration the health risks and low education levels currently recorded in the country where the child is living. The first version of the *Human Capital Index (HCI)* was launched at the annual reunions of the International Monetary Fund and the World Bank Group, held in October 2018 in Bali, Indonesia. It is expected that this metric will attract the political attention of countries and will trigger concerted global action.

HCI has three components¹²:

- *Survival*. It is measured using the mortality rate under 5 years of age.
- *Expected years of learning-adjusted school*. The schools years up until 18 years of age, adjusted with a quality measure resulting from relative performance levels recorded in the countries at international tests such as PISA, TIMSS, PIRLS.
- *Health*. This indicator has two components: one that reflects the state of health during the prenatal development and during early childhood up until 5 years of age, and the second component which expresses the survival rate, defined as being the percentage of 15 year olds that reach the age of 60.

The Human Capital Index (HCI) is given by the product of all three components:

$$HCI = Survival \times School \times Health$$

Table 2 illustrates the values of the *HCI* in 157 states.

¹⁰ World Bank. 2018. The Human Capital Project. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/30498> License: CC BY 3.0 IGO.

¹¹ <http://www.worldbank.org/en/publication/human-capital>

¹² *Ibidem*



TABLE 2 The Human Capital Index (HCI), 2018

Rank	Economy	Lower bound	Value	Upper bound	Rank	Economy	Lower bound	Value	Upper bound	Rank	Economy	Lower bound	Value	Upper bound
157	Chad	0.28	0.29	0.31	103	Honduras	0.47	0.49	0.50	50	Ukraine	0.61	0.65	0.68
156	South Sudan	0.27	0.30	0.33	102	Nepal	0.48	0.49	0.50	49	United Arab Emirates	0.64	0.66	0.67
155	Niger	0.30	0.32	0.33	101	Dominican Republic	0.48	0.49	0.51	48	Vietnam	0.65	0.67	0.68
154	Mali	0.29	0.32	0.34	100	Cambodia	0.47	0.49	0.51	47	Bahrain	0.65	0.67	0.68
153	Liberia	0.31	0.32	0.33	99	Guyana	0.48	0.49	0.51	46	China	0.66	0.67	0.68
152	Nigeria	0.32	0.34	0.36	98	Morocco	0.49	0.50	0.51	45	Chile	0.66	0.67	0.69
151	Sierra Leone	0.33	0.35	0.37	97	El Salvador	0.49	0.50	0.51	44	Bulgaria	0.65	0.68	0.70
150	Mauritania	0.32	0.35	0.38	96	Tunisia	0.50	0.51	0.52	43	Seychelles	0.65	0.68	0.71
149	Côte d'Ivoire	0.33	0.35	0.37	95	Tonga	0.50	0.51	0.53	42	Greece	0.67	0.68	0.69
148	Mozambique	0.34	0.36	0.38	94	Kenya	0.50	0.52	0.53	41	Luxembourg	0.68	0.69	0.70
147	Angola	0.33	0.36	0.39	93	Algeria	0.51	0.52	0.53	40	Slovak Republic	0.68	0.69	0.71
146	Congo, Dem. Rep.	0.35	0.37	0.39	92	Nicaragua	0.51	0.53	0.54	39	Malta	0.69	0.70	0.71
145	Yemen, Rep.	0.35	0.37	0.38	91	Panama	0.52	0.53	0.54	38	Hungary	0.69	0.70	0.72
144	Burkina Faso	0.35	0.37	0.38	90	Paraguay	0.51	0.53	0.55	37	Lithuania	0.70	0.71	0.73
143	Lesotho	0.35	0.37	0.39	89	Tajikistan	0.51	0.53	0.55	36	Croatia	0.71	0.72	0.74
142	Rwanda	0.36	0.37	0.39	88	Macedonia, FYR	0.53	0.53	0.54	35	Latvia	0.71	0.72	0.74
141	Guinea	0.35	0.37	0.39	87	Indonesia	0.52	0.53	0.55					
140	Madagascar	0.35	0.37	0.39	86	Lebanon	0.52	0.54	0.55					
139	Sudan	0.37	0.38	0.39	85	Jamaica	0.53	0.54	0.56	34	Russian Federation	0.68	0.73	0.77
138	Burundi	0.36	0.38	0.40	84	Philippines	0.53	0.55	0.56	33	Iceland	0.73	0.74	0.75
137	Uganda	0.37	0.38	0.39	83	Tuvalu	0.53	0.55	0.57	32	Spain	0.74	0.74	0.75
136	Papua New Guinea	0.36	0.38	0.40	82	West Bank and Gaza	0.54	0.55	0.56	31	Kazakhstan	0.72	0.75	0.77
135	Ethiopia	0.37	0.38	0.40	81	Brazil	0.55	0.56	0.57	30	Poland	0.73	0.75	0.76
134	Pakistan	0.37	0.39	0.40	80	Kosovo	0.55	0.56	0.57	29	Estonia	0.73	0.75	0.76
133	Afghanistan	0.38	0.39	0.40	79	Jordan	0.54	0.56	0.58	28	Cyprus	0.74	0.75	0.76
132	Cameroon	0.37	0.39	0.42	78	Armenia	0.56	0.57	0.58	27	Serbia	0.74	0.76	0.77
131	Zambia	0.37	0.40	0.42	77	Kuwait	0.56	0.58	0.59	26	Belgium	0.75	0.76	0.77
130	Gambia, The	0.37	0.40	0.42	76	Kyrgyz Republic	0.57	0.58	0.59	25	Macao SAR, China	0.75	0.76	0.76
129	Iraq	0.38	0.40	0.41	75	Moldova	0.57	0.58	0.59	24	United States	0.75	0.76	0.77
128	Tanzania	0.39	0.40	0.41	74	Sri Lanka	0.57	0.58	0.59	23	Israel	0.75	0.76	0.78
127	Benin	0.38	0.41	0.43	73	Saudi Arabia	0.57	0.58	0.60	22	France	0.76	0.76	0.77
126	South Africa	0.40	0.41	0.42	72	Peru	0.57	0.59	0.60	21	New Zealand	0.76	0.77	0.78
125	Malawi	0.39	0.41	0.42	71	Iran, Islamic Rep.	0.57	0.59	0.61	20	Switzerland	0.75	0.77	0.78
124	eSwatini	0.38	0.41	0.43	70	Colombia	0.58	0.59	0.61	19	Italy	0.76	0.77	0.78
123	Comoros	0.36	0.41	0.44	69	Azerbaijan	0.58	0.60	0.62	18	Norway	0.76	0.77	0.78
122	Togo	0.39	0.41	0.43	68	Uruguay	0.59	0.60	0.61	17	Denmark	0.76	0.77	0.79
121	Senegal	0.40	0.42	0.43	67	Romania	0.59	0.60	0.62	16	Portugal	0.77	0.78	0.79
120	Congo, Rep.	0.39	0.42	0.44	66	Ecuador	0.59	0.60	0.61	15	United Kingdom	0.77	0.78	0.79
119	Botswana	0.40	0.42	0.44	65	Thailand	0.59	0.60	0.62	14	Czech Republic	0.77	0.78	0.79
118	Timor-Leste	0.41	0.43	0.45	64	Mexico	0.60	0.61	0.61	13	Slovenia	0.78	0.79	0.80
117	Namibia	0.41	0.43	0.45	63	Argentina	0.60	0.61	0.62	12	Austria	0.78	0.79	0.80
116	Ghana	0.42	0.44	0.45	62	Trinidad and Tobago	0.59	0.61	0.63	11	Germany	0.78	0.79	0.81
115	India	0.43	0.44	0.45	61	Georgia	0.60	0.61	0.63	10	Canada	0.79	0.80	0.81
114	Zimbabwe	0.42	0.44	0.46	60	Qatar	0.60	0.61	0.63	9	Netherlands	0.79	0.80	0.81
113	Solomon Islands	0.43	0.44	0.45	59	Montenegro	0.61	0.62	0.62	8	Sweden	0.79	0.80	0.81
112	Haiti	0.42	0.45	0.47	58	Bosnia and Herzegovina	0.61	0.62	0.63	7	Australia	0.79	0.80	0.81
111	Lao PDR	0.43	0.45	0.47	57	Costa Rica	0.61	0.62	0.63	6	Ireland	0.79	0.81	0.82
110	Gabon	0.43	0.45	0.48	56	Albania	0.61	0.62	0.63	5	Finland	0.80	0.81	0.82
109	Guatemala	0.44	0.46	0.47	55	Malaysia	0.61	0.62	0.63	4	Hong Kong SAR, China	0.81	0.82	0.83
108	Vanuatu	0.45	0.47	0.48	54	Oman	0.61	0.62	0.63	3	Japan	0.83	0.84	0.85
107	Myanmar	0.46	0.47	0.49	53	Turkey	0.61	0.63	0.64	2	Korea, Rep.	0.83	0.84	0.86
106	Bangladesh	0.47	0.48	0.49	52	Mauritius	0.60	0.63	0.65	1	Singapore	0.87	0.88	0.90
105	Kiribati	0.45	0.48	0.50	51	Mongolia	0.60	0.63	0.65					
104	Egypt, Arab Rep.	0.47	0.49	0.50										

HCI < 0.40 0.40 ≤ HCI < 0.50 0.50 ≤ HCI < 0.60 0.60 ≤ HCI < 0.70 0.70 ≤ HCI < 0.80 0.80 ≤ HCI

Source: World Bank staff calculations. World Bank. 2018. The Human Capital Project.



World Bank, Washington, DC. © World Bank.

<https://openknowledge.worldbank.org/handle/10986/30498> License: CC BY 3.0 IGO.

The human capital index varies between 0 and 1. The index is measured in terms of productivity of the next generation in comparison to the reference indicator for a complete education and a perfect state of health. An economy in which each and every child born nowadays receives a full and complete education and has a perfect state of health shall have a $HCI = 1$. The lower and upper limits indicate the uncertainty interval around the value of the HCI calculated for each economy.

Romania holds the 67th place out of 157 countries in this ranking with a HCI value = 0.60. Within the analysis carried out for Romania (table 3), differences between men and women can be distinguished, for the indicators which are included in the composite indicator HCI ¹³:

Table 3

<i>Component</i>	<i>Boys</i>	<i>Girls</i>	<i>Overall</i>
HCI	0.58	0.63	0.60
Survival to Age 5	0.99	0.99	0.99
Expected Years of School	12.1	12.2	12.2
Harmonized Test Scores	448	456	452
Learning-adjusted Years of School	8.7	8.9	8.8
Adult Survival Rate	0.82	0.92	0.87
Not Stunted Rate	-	-	-

Source: https://databank.worldbank.org/data/download/hci/HCI_2pager_ROU.pdf

Observations.

The survival rate to age 5 is 99%, and the percentage of 15 year olds who reach the age of 60 is 87%.

The test scores have been converted in equivalent TIMSS units, with an average of 500 and a standard deviation of 100. The children in Romania spend on average, within the pre-primary, primary and secondary education system, a number of 12.2 years, however this average, adjusted with the international tests score which measure the quality of the education received, results in an overall average of 8.8 years, therefore in a loss of 3.4 years.

¹³ https://databank.worldbank.org/data/download/hci/HCI_2pager_ROU.pdf



5. IMD WORLD COMPETITIVENESS YEARBOOK

The IMD World Competitiveness Yearbook is an annual report, published starting with the year 1989, by the *International Institute for Management Development (IMD)* in Switzerland. The yearbook currently assesses the performance of 63 of the world's economies on the basis of 342 criteria measuring various aspects of competitiveness¹⁴:

- economic performance (83 criteria) – a macroeconomic assessment of the national economy;
- government efficiency (73 criteria) – the degree to which government policies contribute to competitiveness;
- business efficiency (71 criteria) – the degree to which the national economic environment encourages businesses to carry out an overall activity which is innovative, profitable and responsible
- infrastructure (115 criteria) – the degree to which basic, technological, scientific and human resources meet the needs of businesses

Two types of data are used for carrying out the assessment: statistic data (international or national) and data resulting from various investigations.

Romania's evolution within the general competitiveness ranking is shown in table 4¹⁵.

Table 4

	2013	2014	2015	2016	2017	2018
<i>The rank of Romania</i>	55	47	47	49	50	49
<i>The number of countries analyzed</i>	60	60	61	61	63	63

The IMD World Competitiveness Yearbook also creates a ranking for digital competitiveness in order to assess the degree to which information technologies lead to transformations in government practices, in business models and in society in general.

Within *the digital competitiveness ranking*, Romania occupies the 54th place for the year 2017 and the 47th place for the year 2018 out of 63 countries¹⁶.

¹⁴ <https://www.imd.org/wcc/world-competitiveness-center-rankings/world-digital-competitiveness-rankings-2018/>

¹⁵ https://en.wikipedia.org/wiki/World_Competitiveness_Yearbook#World_Competitiveness_Scoreboard_1997

¹⁶ <https://www.imd.org/wcc/world-competitiveness-center-rankings/world-digital-competitiveness-rankings-2018/>



6. THE E-GOVERNMENT PROCESS IN ROMANIA

By showcasing these indicators an overview can be obtained over Romania's status with regard to the e-government process:

- Rank 28 out of 28 within the European Union *DESI report (Digital Economy and Society Index)* for the year 2018.
- Rank 42 out of 45 countries included in the *I-DESI 2018 report (International Digital Economy and Society Index)* which analyzes the performances and trends of the digital economy within the countries under assessment during the time-frame 2013-2016.
- Rank 67 out of 193 countries included in the United Nations Organization *E-Government Development Index (EGDI)* report for the year 2018 and occupying the last place in the European Union
- The report on the status of digital government drawn up by the *Organization for Economic Co-operation and Development (OECD)*.
- Rank 67 out of 157 countries for the *Human Capital Index (HCI)* established within *the Human Capital Project (HCP)* launched by the World Bank.
- Rank 47 out of the 63 countries in the digital competitiveness ranking according to the *IMD World Competitiveness Yearbook 2018* report created by the *International Institute for Management Development (IMD)*.

E-government constitutes a complex system of informational provision of government by applying information and communication technologies.

E-government offers administrative services, exchanges of information, the integration of various autonomous systems and services between government and citizen (G2C), between government and business environment (G2B) and between government and other governments (G2G). Through e-government, government services can be available to citizens in a convenient, efficient and transparent matter.

An efficient e-government implies access to official information, provision of quality public services to the citizens and to the companies with the help of electronic means. Thus an increased degree of participation of the citizens in the government process as well as an increased efficiency in the activity of the public administration can be achieved, resulting in a consolidation of democracy and the rule of law institutions.



We consider that these objectives can be reached by means of a systematic approach which would allow the creation and implementation, at government level, of integrated national information systems.

This type of integrated information system is composed of a set of interconnected parts which collect, process, store and distribute information with the purpose of facilitating decision-making and control processes within the organization. However, it also implies a redesign of support processes and information flows with the purpose on improving functionality and reducing costs.

In May 2015, the Romanian Government approved the *National Strategy with regard to the Digital Agenda for Romania 2020*¹⁷.

This strategy can be implemented only through a concerted action of government decision-making agents. Implementation of this strategy can be done only through decision-making continuity and coherence which should exceed the duration of a four year election cycle and which should allow, through a sustained activity, a decrease in discrepancies currently experienced, highlighted by the indicators showcased herein.

In recent years, important resources have been wasted for isolated and parallel projects which have lacked interoperability¹⁸.

At government level, the creation and implementation of integrated information systems in various fields such as: health, education, research, public finance, infrastructure etc. must be used as a catalyst for change. The project for an ERP is not a software design – it is a project for restructuring and organizational change. According to the 80/20 rule, 80% of benefits from such a project will result from the improvement in organization and decision-making processes and only 20% will result from the actual software.

For example, the implementation of an integrated information system for students and graduates of public higher education institutions in Romania (RMU), at a national level, will improve management at university level and management within the National Education Ministry through the possibilities offered to control and obtain information within the

¹⁷ http://www.ancom.org.ro/uploads/links_files/Strategia_nationala_privind_Agenda_Digitala_pentru_Romania_2020.pdf

¹⁸ Stolojan Th., *Avem nevoie de accesul cetățenilor și firmelor la servicii publice digitalizate și interconectate*, Conferința la Iași, 29 septembrie 2018.



decision-making process concerning development of priority fields, thus becoming an important factor in improving the quality in the area of higher education.

There are extensive European funds assigned to Romania for the time-frame 2021-2027 which can be used to digitally transform the society's economy. There is also the possibility of accessing funds directly managed by the European Commission, through the new *Digital Europe* program with a budget of 9.2 billion Euros for the time-frame 2021-2027¹⁹.

The swiftness and success of e-government projects implementation can be decisive in reducing the discrepancies measured using the indicators showcased herein.

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