



Romania

The Network Readiness Index (NRI) is one of the leading global indices on the application and impact of information and communication technology (ICT) in economies around the world. In its latest version of 2023 the NRI Report maps the network-based readiness landscape of 134 economies based on their performances in four different pillars: Technology, People, Governance, and Impact. Each of these pillars is itself comprised of three sub-pillars (see Figure 1) that have been populated by a total of 58 variables.

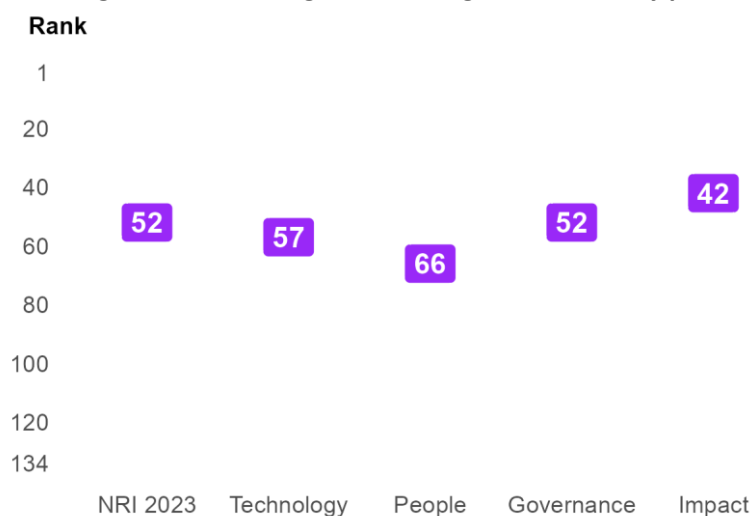
Figure 1: The NRI 2023 model



Global NRI position of Romania

Romania ranks 52nd out of the 134 economies included in the NRI 2023 (Figure 2). Its main strength relates to Impact. The greatest scope for improvement, meanwhile, concerns People.

Figure 2: Romania global ranking, overall and by pillar



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Performance at sub-pillar level

When it comes to sub-pillars, the strongest showings of Romania relate to Economy, Quality of Life and Regulation, among others (Table 1). More could be done, though, to improve the economy's performances in the Individuals, Future Technologies and Governments sub-pillars.

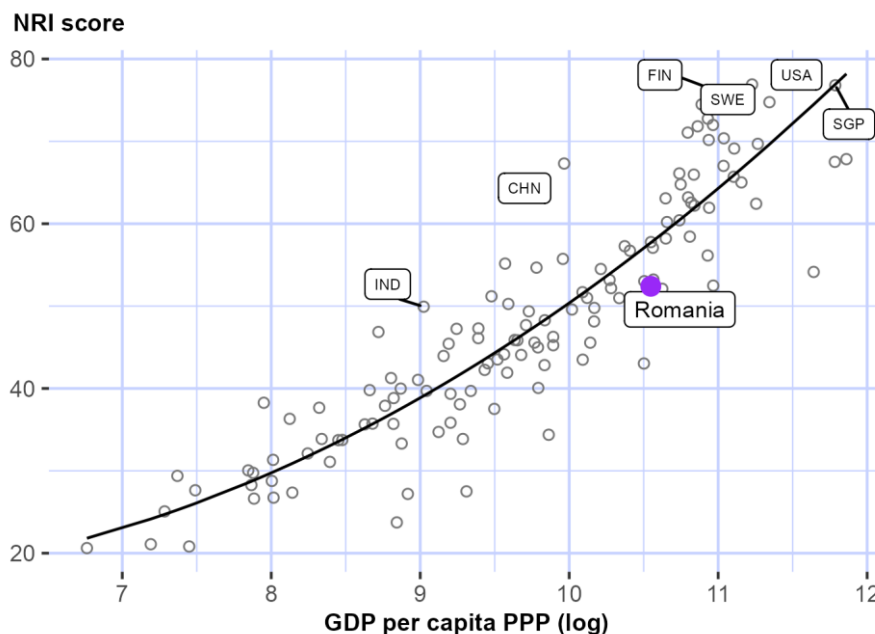
Table 1: Romania rankings by sub-pillar

Sub-pillar	Rank	Sub-pillar	Rank
Economy	33	Businesses	52
Quality of Life	41	Inclusion	63
Regulation	45	SDG Contribution	63
Access	48	Individuals	70
Content	50	Future Technologies	78
Trust	51	Governments	78

NRI score and income

Figure 3 shows the position of Romania in terms of both NRI score and GDP per capita (PPP). The trend line shows the expected NRI score given an economy's income level. As can be seen, Romania is well below the trend line, which suggests that it is underachieving and that one would expect it could raise its network readiness in view of its income level.

Figure 3: NRI score and GDP per capita PPP (log)



Note: USA = United States (rank: 1), SGP = Singapore (rank: 2), FIN = Finland (3), NLD = Netherlands (4), SWE = Sweden (5), CHN = China (20), IND = India (61). Romania belongs to the group of high-income countries, where the best performer is United States of America (USA). The top performer of its region-Europe-is Finland (FIN).

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Performance against its income group and region

High-income countries

Romania is ranked 45th in the group of high-income countries (Figure 4, left panel). In terms of pillar performance, it has a score below the income group average in each of the four pillars. At the sub-pillar level, it trails high-income countries in all of them.

Europe

Romania is ranked 33rd within Europe (Figure 4, right panel). It lags behind its region in each of the four pillars. With regard to sub-pillars, it trails the regional average in each of them.

Figure 4: Performance of Romania against its income group and region, overall and by pillar

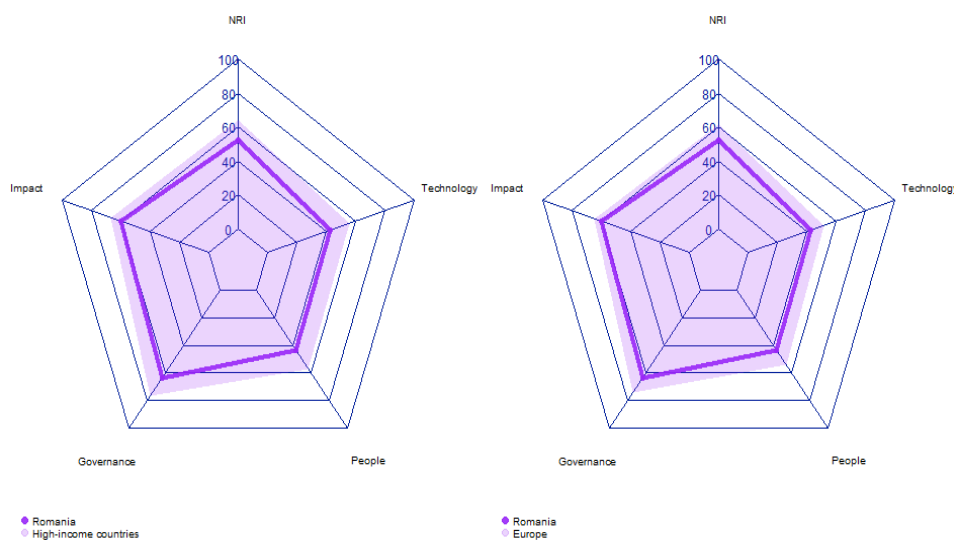


Table 2: Romania scores vs. averages of its income group and region, overall and by pillar

Dimension	Romania	High-income countries	Europe
NRI	52.41	64.07	61.25
Technology	42.76	55.76	51.90
People	43.57	56.99	54.16
Governance	63.55	76.81	74.33
Impact	59.75	66.73	64.61

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Strongest and weakest indicators

The indicators where Romania performs particularly well include 3.2.4 E-commerce legislation, 4.1.6 ICT services exports, and 4.3.4 SDG 7: Affordable and Clean Energy (Table 3). By contrast, the economy's weakest indicators include 1.3.2 Investment in emerging technologies, 4.3.5 SDG 11: Sustainable Cities and Communities, and 3.3.5 Rural gap in use of digital payments.

Table 3: Highlight of Strengths and Opportunities for Romania

Strongest indicators	Rank	Weakest indicators	Rank
3.2.4 E-commerce legislation	1	1.3.3 Robot density	38
4.1.6 ICT services exports	11	2.1.6 AI talent concentration	39
4.3.4 SDG 7: Affordable and Clean Energy	18	3.3.5 Rural gap in use of digital payments	91
1.1.1 Mobile tariffs	20	1.3.2 Investment in emerging technologies	93
1.1.3 FTTH/building Internet subscriptions	21	4.3.5 SDG 11: Sustainable Cities and Communities	93
2.2.2 GERD financed by business enterprise	21		
4.1.1 High-tech and medium-high-tech manufacturing	21		
2.1.5 Adult literacy rate	22		
1.1.4 Population covered by at least a 3G mobile network	25		
3.2.2 ICT regulatory environment	28		
4.2.1 Happiness	30		

Note: For the full list of strengths and weaknesses, see At-A-Glance table.

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NRI 2023 At-A-Glance: Romania

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Rank: 52 (out of 134)

Score: 52.41

Pillar/sub-pillar	Rank	Score	Pillar/sub-pillar	Rank	Score
A. Technology pillar	57	42.76	C. Governance pillar	52	63.55
1st sub-pillar: Access	48	70.12	1st sub-pillar: Trust	51	55.41
2nd sub-pillar: Content	50	28.72	2nd sub-pillar: Regulation	45	72.56
3rd sub-pillar: Future Technologies	78	29.45	3rd sub-pillar: Inclusion	63	62.67
B. People pillar	66	43.57	D. Impact pillar	42	59.75
1st sub-pillar: Individuals	70	46.54	1st sub-pillar: Economy	33	38.83
2nd sub-pillar: Businesses	52	48.95	2nd sub-pillar: Quality of Life	41	74.98
3rd sub-pillar: Governments	78	35.22	3rd sub-pillar: SDG Contribution	63	65.43

The Network Readiness Index in detail

Indicator	Rank	Score	Indicator	Rank	Score
A. Technology pillar	57	42.76	C. Governance pillar	52	63.55
1st sub-pillar: Access	48	70.12	1st sub-pillar: Trust	51	55.41
1.1.1 Mobile tariffs	20	83.85	3.1.1 Secure Internet servers	33	79.56
1.1.2 Handset prices	62	48.27	3.1.2 Cybersecurity	70	75.87
1.1.3 FTTH/building Internet subscriptions	21	48.13	3.1.3 Online access to financial account	74	23.59
1.1.4 Population covered by at least a 3G mobile network	25	99.99	3.1.4 Internet shopping	49	42.63
1.1.5 International Internet bandwidth	73	70.37	2nd sub-pillar: Regulation	45	72.56
1.1.6 Internet access in schools	NA	NA	3.2.1 Regulatory quality	54	56.58
2nd sub-pillar: Content	50	28.72	3.2.2 ICT regulatory environment	28	90.59
1.2.1 GitHub commits	43	20.54	3.2.3 Regulation of emerging technologies	54	48.83
1.2.2 Internet domain registrations	43	10.46	3.2.4 E-commerce legislation	1	100.00
1.2.3 Mobile apps development	54	70.24	3.2.5 Privacy protection by law content	63	66.81
1.2.4 AI scientific publications	38	13.65	3rd sub-pillar: Inclusion	63	62.67
3rd sub-pillar: Future Technologies	78	29.45	3.3.1 E-Participation	54	61.63
1.3.1 Adoption of emerging technologies	50	52.70	3.3.2 Socioeconomic gap in use of digital payments	86	61.43
1.3.2 Investment in emerging technologies	93	31.25	3.3.3 Availability of local online content	45	71.88

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Indicator	Rank	Score	Indicator	Rank	Score
1.3.3 Robot density	38	5.14	3.3.4 Gender gap in Internet use	53	68.68
1.3.4 Computer software spending	43	28.69	3.3.5 Rural gap in use of digital payments	91	49.73
B. People pillar			D. Impact pillar		
<i>1st sub-pillar: Individuals</i>			<i>1st sub-pillar: Economy</i>		
2.1.1 Mobile broadband internet traffic within the country	40	18.99	4.1.1 High-tech and medium-high-tech manufacturing	21	54.64
2.1.2 ICT skills in the education system	46	56.38	4.1.2 High-tech exports	43	20.59
2.1.3 Use of virtual social networks	66	63.15	4.1.3 PCT patent applications	71	2.28
2.1.4 Tertiary enrollment	65	34.09	4.1.4 Domestic market size	35	63.91
2.1.5 Adult literacy rate	22	98.50	4.1.5 Prevalence of gig economy	76	36.34
2.1.6 AI talent concentration	39	8.15	4.1.6 ICT services exports	11	55.23
<i>2nd sub-pillar: Businesses</i>			<i>2nd sub-pillar: Quality of Life</i>		
2.2.1 Firms with website	62	48.20	4.2.1 Happiness	30	75.97
2.2.2 GERD financed by business enterprise	21	68.80	4.2.2 Freedom to make life choices	58	76.86
2.2.3 Knowledge intensive employment	47	41.53	4.2.3 Income inequality	46	71.36
2.2.4 Annual investment in telecommunication services	58	78.89	4.2.4 Healthy life expectancy at birth	56	75.73
2.2.5 GERD performed by business enterprise	47	7.34	<i>3rd sub-pillar: SDG Contribution</i>		
<i>3rd sub-pillar: Governments</i>			4.3.1 SDG 3: Good Health and Well-Being	62	70.74
2.3.1 Government online services	69	64.79	4.3.2 SDG 4: Quality Education	48	38.25
2.3.2 Publication and use of open data	NA	NA	4.3.3 SDG 5: Women's economic opportunity	39	86.73
2.3.3 Government promotion of investment in emerging tech	81	32.48	4.3.4 SDG 7: Affordable and Clean Energy	18	81.72
2.3.4 R&D expenditure by governments and higher education	62	8.38	4.3.5 SDG 11: Sustainable Cities and Communities	93	49.71

NOTE: ● a strength and ○ a weakness.

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Sources

- Dutta, S., & Lanvin, B. (eds.) (2022). *The Network Readiness Index 2022: Benchmarking the Future of the Network Economy*. Washington DC: Portulans Institute.
- Berry, B. (2019). *berryFunctions: Function Collection Related to Plotting and Hydrology*. R package version 1.18.2. URL: <https://CRAN.R-project.org/package=berryFunctions>
- Dutta, S., & Lanvin, B. (eds.) (2019). *The Network Readiness Index 2019: Towards a Future-Ready Society*. Washington DC: Portulans Institute.
- Dutta, S., & Lanvin, B. (eds.) (2020). *The Network Readiness Index 2020: Fostering Digital Transformation in a post-COVID Global Economy*. Washington DC: Portulans Institute.
- Dutta, S., & Lanvin, B. (eds.) (2021). *The Network Readiness Index 2021: Shaping the Global Recovery. How digital technologies can make the post-COVID world more equal*. Washington DC: Portulans Institute.
- Gohel, D. (2019). *officer: Manipulation of Microsoft Word and PowerPoint Documents*. R package version 0.3.6. URL: <https://CRAN.R-project.org/package=officer>
- Gohel, D. (2019). *flextable: Functions for Tabular Reporting*. R package version 0.5.6. URL: <https://CRAN.R-project.org/package=flextable>
- Milton Bache, S. & Wickham, H. (2014). *magrittr: A Forward-Pipe Operator for R*. R package version 1.5. URL: <https://CRAN.R-project.org/package=magrittr>
- Nakazawa, M. (2019). *fmsb: Functions for Medical Statistics Book with some Demographic Data*. R package version 0.7.0. URL: <https://CRAN.R-project.org/package=fmsb>
- R Core Team (2018). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. URL: <https://www.R-project.org/>.
- Slowikowski, K. (2019). *ggrepel: Automatically Position Non-Overlapping Text Labels with 'ggplot2'*. R package version 0.8.1. URL: <https://CRAN.R-project.org/package=ggrepel>
- Wickham, H. (2007). Reshaping Data with the reshape Package. *Journal of Statistical Software*, 21(12), 1-20. URL: <http://www.jstatsoft.org/v21/i12/>.
- Wickham, H. (2016). *ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag. New York.
- Wickham et al., (2019). Welcome to the tidyverse. *Journal of Open Source Software*, 4(43), 1686, URL: <https://doi.org/10.21105/joss.01686>