

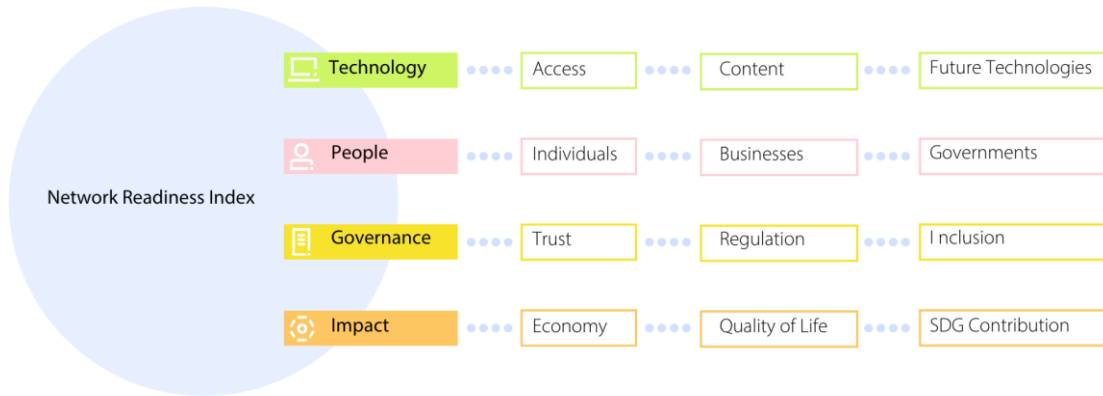
Network Readiness Index 2024



Luxembourg

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 2024 the NRI Report maps the network-based readiness landscape of 133 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 54 variables.

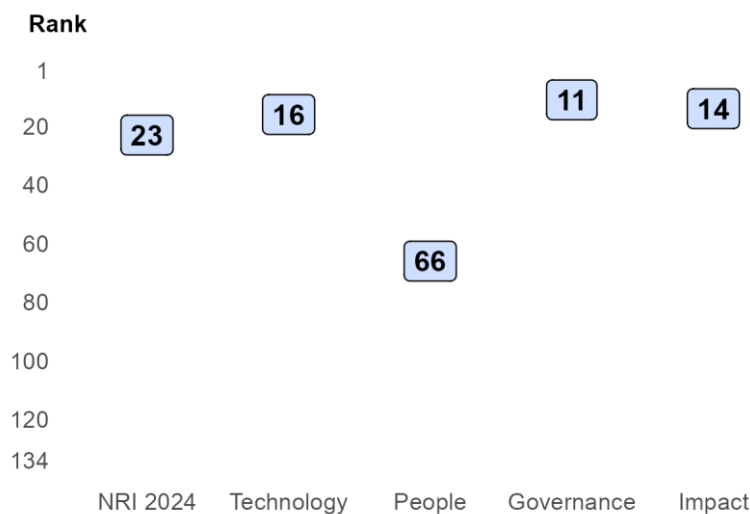
Figure 1: The NRI 2024 model



Global NRI position of Luxembourg

Luxembourg ranks 23rd out of the 133 economies included in the NRI 2024 (Figure 2). Its main strength relates to Governance. The greatest scope for improvement, meanwhile, concerns People.

Figure 2: Luxembourg 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 Luxembourg relate to Regulation, SDG Contribution and Quality of Life, among others (Table 1). More could be done, though, to improve the economy's performances in the Economy, Businesses and Individuals sub-pillars.

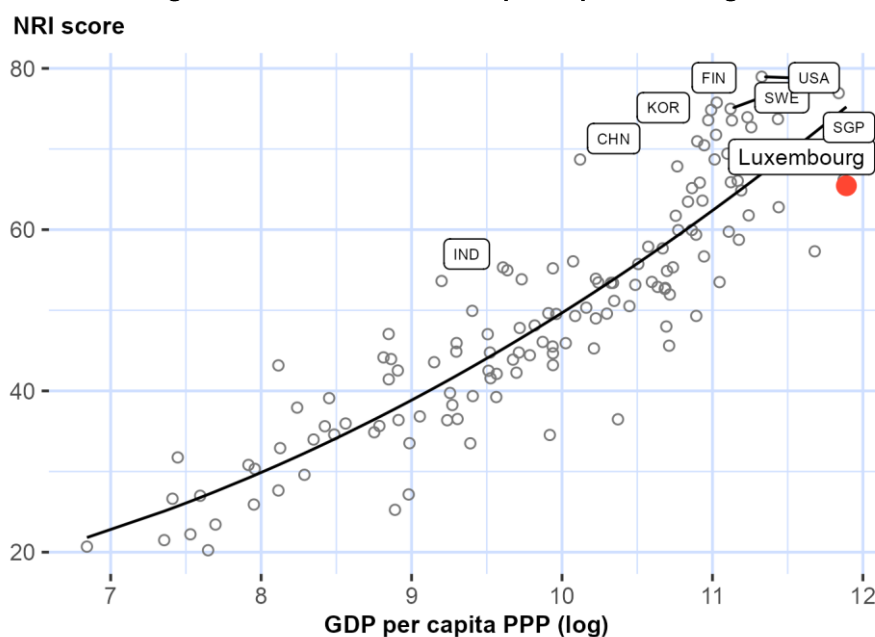
Table 1: Luxembourg rankings by sub-pillar

Sub-pillar	Rank	Sub-pillar	Rank
Regulation	1	Content	20
SDG Contribution	6	Trust	20
Quality of Life	8	Governments	30
Future Technologies	15	Economy	32
Inclusion	17	Businesses	40
Access	18	Individuals	114

NRI score and income

Figure 3 shows the position of Luxembourg 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, Luxembourg 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), SWE = Sweden (4), KOR = Republic of Korea (5), CHN = China (17), and IND = India (49). Luxembourg 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

Luxembourg is ranked 22nd in the group of high-income countries (Figure 4, left panel). In terms of pillar performance, it has a score higher than the income group average in three of the four pillars: NRI, Technology, Governance and Impact. At the sub-pillar level, it outperforms high-income countries in eight of the twelve sub-pillars: Access, Content, Future Technologies, Trust, Regulation, Inclusion, Quality of Life and SDG Contribution.

Europe

Luxembourg is ranked 15th within Europe (Figure 4, right panel). It has a score above the regional average in three of the four pillars: NRI, Technology, Governance and Impact. With regard to sub-pillars, it outperforms the average in Europe in eight of the twelve sub-pillars: Access, Content, Future Technologies, Trust, Regulation, Inclusion, Quality of Life and SDG Contribution.

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

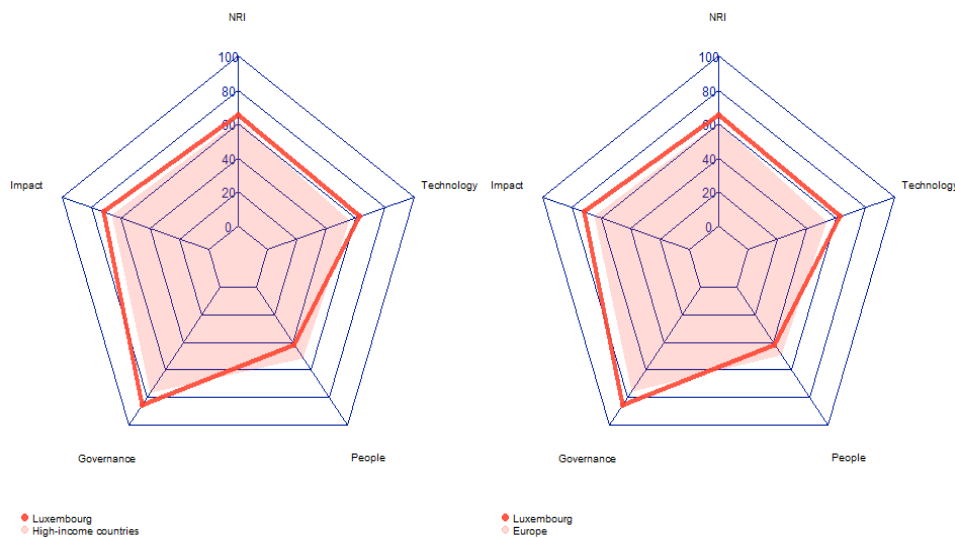


Table 2: Luxembourg scores vs. averages of its income group and region, overall and by pillar

Dimension	Luxembourg	High-income countries	Europe
NRI	65.45	62.50	60.84
Technology	62.90	55.84	53.51
People	41.72	51.81	49.45
Governance	85.60	76.61	75.76
Impact	71.57	65.73	64.63

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Strongest and weakest indicators

The indicators where Luxembourg performs particularly well include 1.1.4 Population covered by at least a 3G mobile network, 1.1.6 Internet access in schools, and 3.2.3 Regulation of emerging technologies (Table 3). By contrast, the economy's weakest indicators include 2.1.1 Mobile broadband internet traffic within the country, 1.1.3 FTTH/building Internet subscriptions, and 1.2.4 AI scientific publications.

Table 3: Highlight of Strengths and Opportunities for Luxembourg

Strongest indicators	Rank	Weakest indicators	Rank
1.1.4 Population covered by at least a 3G mobile network	1	2.1.5 AI talent concentration	23
1.1.6 Internet access in schools	1	2.2.4 Public cloud computing market scale	57
3.2.3 Regulation of emerging technologies	1	1.3.4 Computer software spending	78
3.2.4 E-commerce legislation	1	2.1.3 Use of virtual social networks	92
4.3.3 SDG 5: Women's economic opportunity	1	2.2.3 Annual investment in telecommunication services	92
1.1.1 Mobile tariffs	2	4.1.2 Domestic market scale	92
3.2.1 Regulatory quality	5	1.2.4 AI scientific publications	115
3.2.5 Privacy protection by law content	5	1.1.3 FTTH/building Internet subscriptions	116
1.2.2 Internet domain registrations	6	2.1.1 Mobile broadband internet traffic within the country	121
4.2.4 Healthy life expectancy at birth	7		
4.3.4 SDG 7: Affordable and Clean Energy	9		
1.3.2 Investment in emerging technologies	10		
4.2.1 Happiness	10		
4.3.5 SDG 11: Sustainable Cities and Communities	11		

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

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NRI 2024 At-A-Glance: Luxembourg

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Rank: 23 (out of 133)

Score: 65.45

Pillar/sub-pillar	Rank	Score	Pillar/sub-pillar	Rank	Score
A. Technology pillar	16	62.90	C. Governance pillar	11	85.60
1st sub-pillar: Access	18	79.43	1st sub-pillar: Trust	20	80.54
2nd sub-pillar: Content	20	48.90	2nd sub-pillar: Regulation	1	95.43
3rd sub-pillar: Future Technologies	15	60.36	3rd sub-pillar: Inclusion	17	80.83
B. People pillar	66	41.72	D. Impact pillar	14	71.57
1st sub-pillar: Individuals	114	31.40	1st sub-pillar: Economy	32	41.78
2nd sub-pillar: Businesses	40	41.67	2nd sub-pillar: Quality of Life	8	87.37
3rd sub-pillar: Governments	30	52.09	3rd sub-pillar: SDG Contribution	6	85.57

The Network Readiness Index in detail

Indicator	Rank	Score	Indicator	Rank	Score
A. Technology pillar	16	62.90	C. Governance pillar	11	85.60
<i>1st sub-pillar: Access</i>	18	79.43	<i>1st sub-pillar: Trust</i>	20	80.54
1.1.1 Mobile tariffs	2	98.56	• 3.1.1 Secure Internet servers	17	85.48
1.1.2 Handset prices	23	90.95	3.1.2 Cybersecurity	18	97.42
1.1.3 FTTH/building Internet subscriptions	116	7.04	○ 3.1.3 Online access to financial account	NA	NA
1.1.4 Population covered by at least a 3G mobile network	1	100.00	• 3.1.4 Internet shopping	35	58.71
1.1.5 International Internet bandwidth	21	80.03	<i>2nd sub-pillar: Regulation</i>	1	95.43
1.1.6 Internet access in schools	1	100.00	• 3.2.1 Regulatory quality	5	91.07
<i>2nd sub-pillar: Content</i>	20	48.90	3.2.2 ICT regulatory environment	38	88.69
1.2.1 GitHub commits	22	49.62	3.2.3 Regulation of emerging technologies	1	100.00
1.2.2 Internet domain registrations	6	74.79	• 3.2.4 E-commerce legislation	1	100.00
1.2.3 Mobile apps development	44	70.59	3.2.5 Privacy protection by law content	5	97.37
1.2.4 AI scientific publications	115	0.59	<i>3rd sub-pillar: Inclusion</i>	17	80.83
<i>3rd sub-pillar: Future Technologies</i>	15	60.36	3.3.1 E-Participation	25	74.42
1.3.1 Adoption of emerging technologies	15	85.29	3.3.2 Socioeconomic gap in use of digital payments	15	96.82
1.3.2 Investment in emerging technologies	10	79.50	• 3.3.3 Availability of local online content	17	86.54
1.3.3 Robot density	NA	NA	3.3.4 Gender gap in Internet use	36	70.10

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Indicator	Rank	Score		Indicator	Rank	Score	
1.3.4 Computer software spending	78	16.30	○	3.3.5 Rural gap in use of digital payments	17	76.25	
B. People pillar	66	41.72		D. Impact pillar	14	71.57	
<i>1st sub-pillar: Individuals</i>	114	31.40		<i>1st sub-pillar: Economy</i>	32	41.78	
2.1.1 Mobile broadband internet traffic within the country	121	1.54	○	4.1.1 ICT patent applications	15	46.65	
2.1.2 ICT skills in the education system	43	63.60		4.1.2 Domestic market scale	92	43.37	○
2.1.3 Use of virtual social networks	92	38.76	○	4.1.3 Prevalence of gig economy	49	50.29	
2.1.4 Adult literacy rate	NA	NA		4.1.4 ICT services exports	37	26.80	
2.1.5 AI talent concentration	23	21.67	○	<i>2nd sub-pillar: Quality of Life</i>	8	87.37	
<i>2nd sub-pillar: Businesses</i>	40	41.67		4.2.1 Happiness	10	84.87	●
2.2.1 Firms with website	14	82.27		4.2.2 Freedom to make life choices	19	90.85	
2.2.2 Number of venture capital deals invested in AI	27	19.64		4.2.3 Income inequality	37	77.89	
2.2.3 Annual investment in telecommunication services	92	44.18	○	4.2.4 Healthy life expectancy at birth	7	94.91	●
2.2.4 Public cloud computing market scale	57	20.58	○	<i>3rd sub-pillar: SDG Contribution</i>	6	85.57	
<i>3rd sub-pillar: Governments</i>	30	52.09		4.3.1 SDG 3: Good Health and Well-Being	24	87.10	
2.3.1 Government online services	29	81.42		4.3.2 SDG 4: Quality Education	32	57.65	
2.3.2 Data Capabilities	NA	NA		4.3.3 SDG 5: Women's economic opportunity	1	100.00	●
2.3.3 Government promotion of investment in emerging technologies	30	56.59		4.3.4 SDG 7: Affordable and Clean Energy	9	93.49	●
2.3.4 R&D expenditure by governments and higher education	39	18.26		4.3.5 SDG 11: Sustainable Cities and Communities	11	95.15	●

NOTE: ● a strength and ○ a weakness.

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Sources

Dutta, S., & Lanvin, B. (eds.) (2024). *The Network Readiness Index 2024*. Oxford, UK; Washington DC, USA.

Dutta, S., & Lanvin, B. (eds.) (2023). *The Network Readiness Index 2023: Trust in Network Society: A Crisis of the Digital Age*. Oxford, UK; Washington DC, USA.

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>