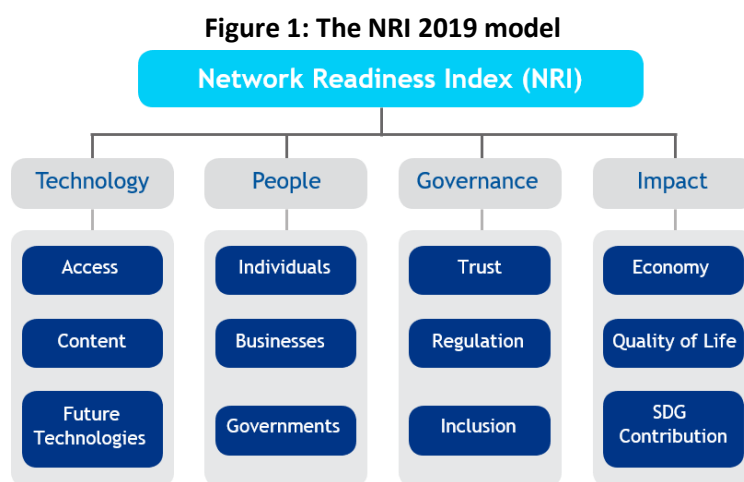


Network Readiness Index 2019

Estonia

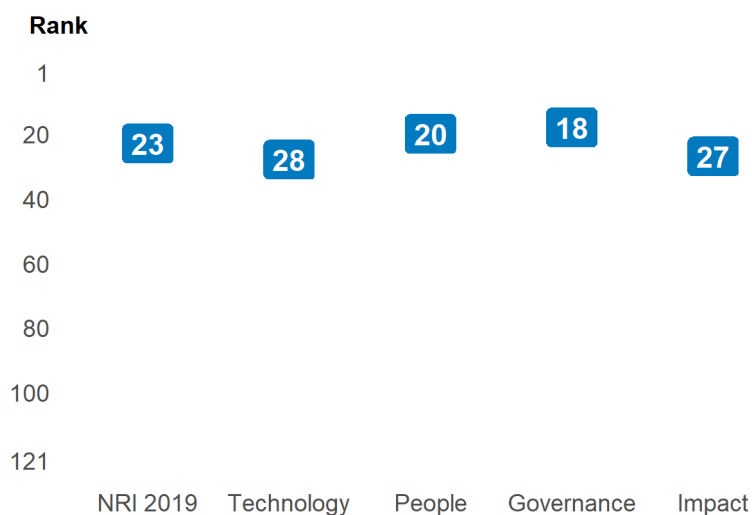
The Network Readiness Index (NRI) is one of the leading global indices on the application and impact of information and communication technology (ICT) in economies around the world. In its latest version of 2019 the NRI Report maps the network-based readiness landscape of 121 economies based on their 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 62 variables.



Global NRI position of Estonia

Estonia ranks 23rd out of the 121 economies included in the NRI 2019 (Figure 2). Its main strength relates to Governance. The greatest scope for improvement, meanwhile, concerns Technology.

Figure 2: Estonia global ranking, overall and by pillar



Performance at sub-pillar level

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

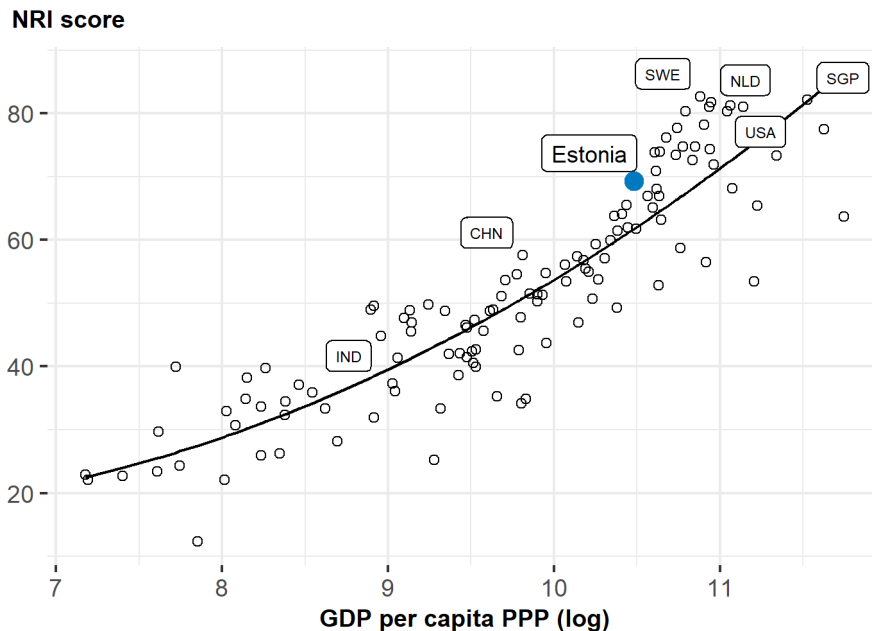
Table 1: Estonia rankings by sub-pillar

Sub-pillar	Rank	Sub-pillar	Rank
SDG Contribution	7	Trust	22
Inclusion	11	Access	26
Individuals	13	Businesses	26
Content	15	Quality of Life	28
Governments	19	Future Technologies	41
Regulation	19	Economy	42

NRI score and income

Figure 3 shows the position of Estonia 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, Estonia is well above the trend line, which suggests that it has a greater network readiness than would be expected given its income level.

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



Note: SWE = Sweden (rank: 1), SGP = Singapore (2), NLD = Netherlands (3), CHN = China (41), IND = India (79). USA is ranked 8th. Estonia belongs to the group of high-income countries, where the best performer is Sweden (SWE). The top performer of its region—Europe—is also Sweden (SWE).

Performance against its income group and region

High-income countries

Estonia is ranked 23rd 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 two of the four pillars: Score, People and Governance. At the sub-pillar level, it outperforms high-income countries in nine of the twelve sub-pillars: Access, Content, Individuals, Businesses, Governments, Trust, Regulation, Inclusion and SDG Contribution.

Europe

Estonia is ranked 16th within Europe (Figure 4, right panel). It outperforms its region in each of the four pillars. With regard to sub-pillars, it outperforms the average in Europe in ten of the twelve sub-pillars: Access, Content, Individuals, Businesses, Governments, Trust, Regulation, Inclusion, Quality of Life and SDG Contribution.

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

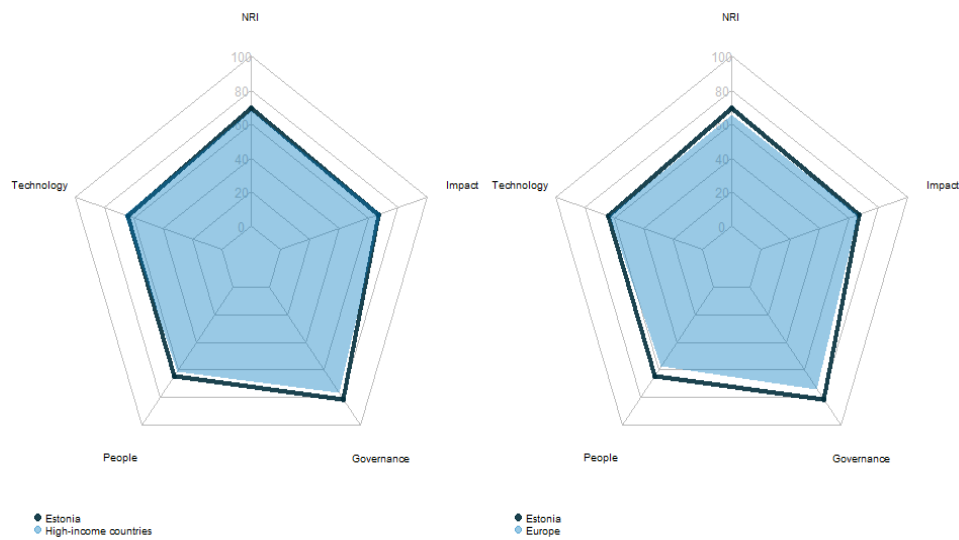


Table 2: Estonia scores vs. averages of its income group and region, overall and by pillar

Dimension	Estonia	High-income countries	Europe
NRI	69.30	68.12	65.20
Technology	64.34	66.07	63.08
People	64.70	61.07	57.50
Governance	81.63	77.07	73.99
Impact	66.54	68.29	66.24

Strongest and weakest indicators

The indicators where Estonia performs particularly well include Internet access in schools, E-commerce legislation, and Use of clean fuels and technology (Table 3). By contrast, the economy's weakest indicators include Computer software spending, Intellectual property receipts, and Online trust and safety.

Table 3: Top-ranked and bottom-ranked indicators of Estonia

Strongest indicators	Rank	Weakest indicators	Rank
Internet access in schools	1	ICT regulatory environment	45
E-commerce legislation	1	Handset prices	46
Use of clean fuels and technology	1	Social safety net protection	46
ICT use and government efficiency	2	Happiness	47
Adult literacy rate	3	Government procurement of advanced technology products	48
Active mobile-broadband subscriptions	5	Medium and high-tech industry	53
Cybersecurity	5	Use of virtual social networks	56
Legal framework's adaptability to digital business models	5	Online trust and safety	59
Pollution	6	Intellectual property receipts	65
Secure Internet servers	9	Computer software spending	77

NRI 2019 At-A-Glance: Estonia

Network Readiness Index

Rank: 23 (out of 121)

Score: 69.30

Pillar/sub-pillar	Rank	Score	Pillar/sub-pillar	Rank	Score
A. Technology pillar	28	64.34	C. Governance pillar	18	81.63
1st sub-pillar: Access	26	82.62	1st sub-pillar: Trust	22	78.27
2nd sub-pillar: Content	15	71.64	2nd sub-pillar: Regulation	19	83.60
3rd sub-pillar: Future Technologies	41	38.77	3rd sub-pillar: Inclusion	11	83.02
B. People pillar	20	64.70	D. Impact pillar	27	66.54
1st sub-pillar: Individuals	13	70.45	1st sub-pillar: Economy	42	28.67
2nd sub-pillar: Businesses	26	54.57	2nd sub-pillar: Quality of Life	28	74.08
3rd sub-pillar: Governments	19	69.07	3rd sub-pillar: SDG Contribution	7	96.87

The Network Readiness Index in detail

Indicator	Rank	Score	Indicator	Rank	Score
A. Technology pillar			C. Governance pillar		
<i>1st sub-pillar: Access</i>			<i>1st sub-pillar: Trust</i>		
1.1.1 Mobile tariffs	33	75.27	3.1.1 Rule of law	22	81.63
1.1.2 Handset prices	46	55.61	3.1.2 Software piracy rate	29	64.86
1.1.3 Internet access	17	89.85	3.1.3 Secure Internet servers	9	92.13
1.1.4 4G mobile network coverage	24	99.00	3.1.4 Cybersecurity	5	97.15
1.1.5 Fixed-broadband subscriptions	42	85.12	3.1.5 Online trust and safety	59	55.56
1.1.6 International Internet bandwidth	27	73.46	<i>2nd sub-pillar: Regulation</i>		
1.1.7 Internet access in schools	1	100.00	3.2.1 Regulatory quality	17	85.83
<i>2nd sub-pillar: Content</i>			3.2.2 Ease of doing business	17	89.12
1.2.1 Digital participation and content creation	*	*	3.2.3 Legal framework's adaptability to digital business models	5	86.35
1.2.2 Mobile apps development	22	84.08	3.2.4 E-commerce legislation	1	100.00
1.2.3 Intellectual property receipts	65	0.41	3.2.5 Social safety net protection	46	52.28
<i>3rd sub-pillar: Future Technologies</i>			3.2.6 ICT regulatory environment	45	88.03
1.3.1 Availability of latest technologies	25	77.27	<i>3rd sub-pillar: Inclusion</i>		
1.3.2 Company investment in emerging technology	35	55.43	3.3.1 E-Participation	27	89.81
1.3.3 Government procurement of advanced technology products	48	45.81	3.3.2 Socioeconomic gap in use of digital payments	16	95.47
1.3.4 ICT PCT patent applications	24	39.38	3.3.3 Availability of local online content	14	86.73
1.3.5 Computer software spending	77	9.09	3.3.4 Gender gap in internet use	21	66.52
1.3.6 Robot density	40	5.63	3.3.5 Rural gap in use of digital payments	17	76.59
B. People pillar			D. Impact pillar		
<i>1st sub-pillar: Individuals</i>			<i>1st sub-pillar: Economy</i>		
2.1.1 Internet users	19	88.54	4.1.1 Medium and high-tech industry	53	35.38
2.1.2 Active mobile-broadband subscriptions	5	57.66	4.1.2 High-tech exports	25	32.07
2.1.3 Use of virtual social networks	56	56.34	4.1.3 PCT patent applications	30	7.03
2.1.4 Tertiary enrolment	30	50.68	4.1.4 Labour productivity per employee	41	40.20
2.1.5 Adult literacy rate	3	99.86	<i>2nd sub-pillar: Quality of Life</i>		
2.1.6 ICT skills	15	69.64	4.2.1 Happiness	47	63.20
<i>2nd sub-pillar: Businesses</i>			4.2.2 Freedom to make life choices	33	82.67
2.2.1 Firms with website	20	77.58	4.2.3 Income inequality	32	79.74
2.2.2 Internet shopping	24	59.87	4.2.4 Healthy life expectancy at birth	41	70.70
2.2.3 Professionals	19	53.98	<i>3rd sub-pillar: SDG Contribution</i>		
2.2.4 Technicians and associate professionals	26	59.68	4.3.1 Access to basic services	26	99.25
2.2.5 Extent of staff training	30	60.46	4.3.2 Pollution	6	98.86
2.2.6 R&D expenditure by businesses	34	15.84	4.3.3 Road safety	22	89.38
<i>3rd sub-pillar: Governments</i>			4.3.4 Reading proficiency in schools	NA	NA
2.3.1 Government online services	26	89.23	4.3.5 Maths proficiency in schools	NA	NA
2.3.2 Publication and use of open data	44	36.31	4.3.6 Use of clean fuels and technology	1	100.00
2.3.3 ICT use and government efficiency	2	89.01			
2.3.4 R&D expenditure by governments and higher education	17	61.74			

* Confidential data

Sources

- 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 Index 2019: Towards a Future-Ready Society*. 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>