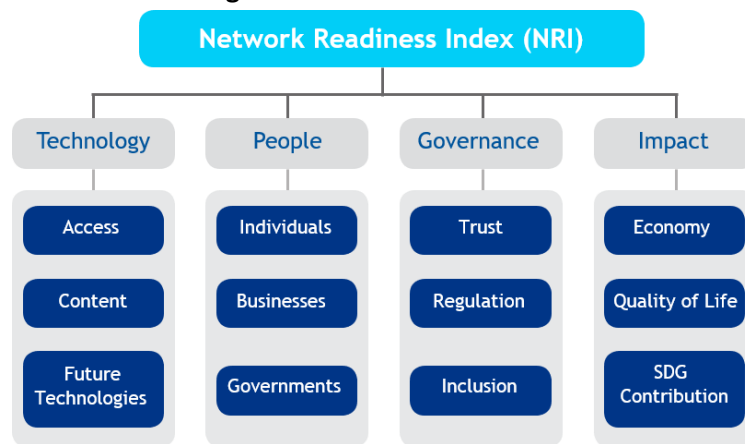


Network Readiness Index 2019

Finland

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.

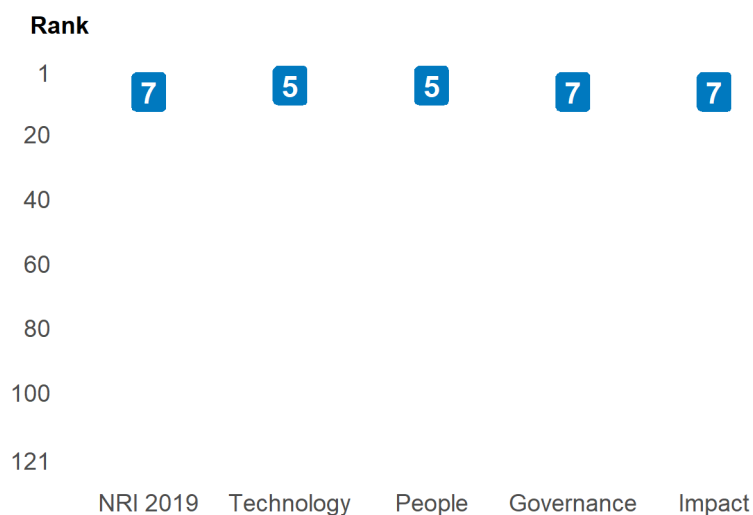
Figure 1: The NRI 2019 model



Global NRI position of Finland

Finland ranks 7th out of the 121 economies included in the NRI 2019 (Figure 2). Its main strength relates to Technology and People. The greatest scope for improvement, meanwhile, concerns Governance and Impact.

Figure 2: Finland global ranking, overall and by pillar



Performance at sub-pillar level

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

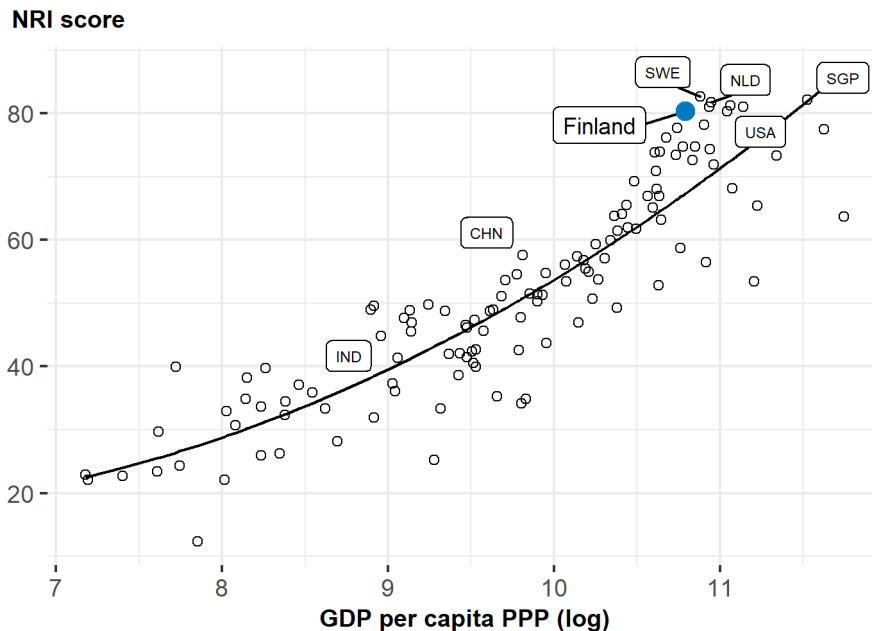
Table 1: Finland rankings by sub-pillar

Sub-pillar	Rank	Sub-pillar	Rank
Regulation	2	Inclusion	9
Quality of Life	2	Governments	11
Businesses	5	SDG Contribution	11
Future Technologies	6	Individuals	12
Trust	7	Access	15
Content	9	Economy	16

NRI score and income

Figure 3 shows the position of Finland 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, Finland 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. Finland 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

Finland is ranked 7th 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 each of the four pillars. At the sub-pillar level, it has a higher score than the average of high-income countries in all of them.

Europe

Finland is ranked 6th within Europe (Figure 4, right panel). It outperforms its region in each of the four pillars. With regard to sub-pillars, it has a higher score than the regional average in each of the twelve sub-pillars.

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

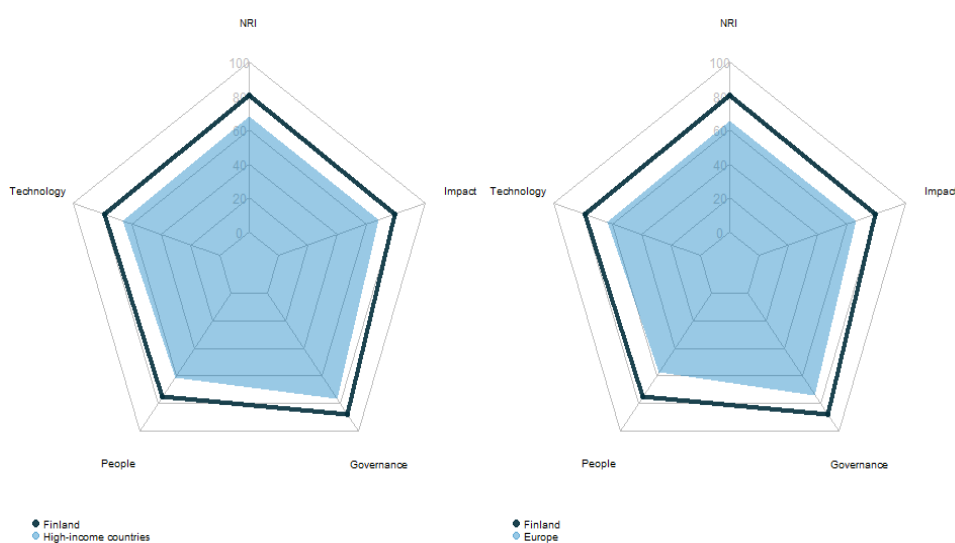


Table 2: Finland scores vs. averages of its income group and region, overall and by pillar

Dimension	Finland	High-income countries	Europe
NRI	80.34	68.12	65.20
Technology	78.66	66.07	63.08
People	75.28	61.07	57.50
Governance	88.15	77.07	73.99
Impact	79.27	68.29	66.24

Strongest and weakest indicators

The indicators where Finland performs particularly well include Internet access in schools, Availability of latest technologies, and Firms with website (Table 3). By contrast, the economy's weakest indicators include High-tech exports, Use of virtual social networks, and Online trust and safety.

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

Strongest indicators	Rank	Weakest indicators	Rank
Internet access in schools	1	ICT regulatory environment	22
Availability of latest technologies	1	Mobile apps development	23
Firms with website	1	Fixed-broadband subscriptions	25
Rule of law	1	Healthy life expectancy at birth	25
E-commerce legislation	1	Medium and high-tech industry	27
E-Participation	1	Gender gap in internet use	40
Happiness	1	International Internet bandwidth	43
Use of clean fuels and technology	1	Online trust and safety	44
Pollution	2	Use of virtual social networks	49
ICT PCT patent applications	4	High-tech exports	52

NRI 2019 At-A-Glance: Finland

Network Readiness Index

Rank: 7 (out of 121)

Score: 80.34

Pillar/sub-pillar	Rank	Score	Pillar/sub-pillar	Rank	Score
A. Technology pillar	5	78.66	C. Governance pillar	7	88.15
1st sub-pillar: Access	15	86.44	1st sub-pillar: Trust	7	87.51
2nd sub-pillar: Content	9	78.32	2nd sub-pillar: Regulation	2	92.30
3rd sub-pillar: Future Technologies	6	71.21	3rd sub-pillar: Inclusion	9	84.64
B. People pillar	5	75.28	D. Impact pillar	7	79.27
1st sub-pillar: Individuals	12	70.99	1st sub-pillar: Economy	16	48.64
2nd sub-pillar: Businesses	5	75.71	2nd sub-pillar: Quality of Life	2	93.19
3rd sub-pillar: Governments	11	79.14	3rd sub-pillar: SDG Contribution	11	95.99

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	22	82.27	3.1.1 Rule of law	1	100.00
1.1.2 Handset prices	16	70.36	3.1.2 Software piracy rate	13	90.54
1.1.3 Internet access	20	88.21	3.1.3 Secure Internet servers	13	89.02
1.1.4 4G mobile network coverage	9	99.90	3.1.4 Cybersecurity	21	91.78
1.1.5 Fixed-broadband subscriptions	25	93.26	3.1.5 Online trust and safety	44	66.21
1.1.6 International Internet bandwidth	43	71.09	<i>2nd sub-pillar: Regulation</i>		
1.1.7 Internet access in schools	1	100.00	3.2.1 Regulatory quality	7	90.76
<i>2nd sub-pillar: Content</i>			3.2.2 Ease of doing business	19	88.35
1.2.1 Digital participation and content creation	*	*	3.2.3 Legal framework's adaptability to digital business models	11	82.74
1.2.2 Mobile apps development	23	83.22	3.2.4 E-commerce legislation	1	100.00
1.2.3 Intellectual property receipts	6	28.27	3.2.5 Social safety net protection	7	98.11
<i>3rd sub-pillar: Future Technologies</i>			3.2.6 ICT regulatory environment	22	93.83
1.3.1 Availability of latest technologies	1	100.00	<i>3rd sub-pillar: Inclusion</i>		
1.3.2 Company investment in emerging technology	6	86.85	3.3.1 E-Participation	1	100.00
1.3.3 Government procurement of advanced technology products	19	60.98	3.3.2 Socioeconomic gap in use of digital payments	5	98.64
1.3.4 ICT PCT patent applications	4	83.34	3.3.3 Availability of local online content	15	86.14
1.3.5 Computer software spending	8	54.55	3.3.4 Gender gap in internet use	40	61.70
1.3.6 Robot density	19	41.52	3.3.5 Rural gap in use of digital payments	16	76.73
B. People pillar			D. Impact pillar		
<i>1st sub-pillar: Individuals</i>			<i>1st sub-pillar: Economy</i>		
2.1.1 Internet users	20	88.02	4.1.1 Medium and high-tech industry	27	52.82
2.1.2 Active mobile-broadband subscriptions	4	61.65	4.1.2 High-tech exports	52	16.91
2.1.3 Use of virtual social networks	49	58.42	4.1.3 PCT patent applications	6	67.93
2.1.4 Tertiary enrolment	7	64.35	4.1.4 Labour productivity per employee	19	56.91
2.1.5 Adult literacy rate	NA	NA	<i>2nd sub-pillar: Quality of Life</i>		
2.1.6 ICT skills	10	82.49	4.2.1 Happiness	1	100.00
<i>2nd sub-pillar: Businesses</i>			4.2.2 Freedom to make life choices	11	94.76
2.2.1 Firms with website	1	100.00	4.2.3 Income inequality	7	94.47
2.2.2 Internet shopping	12	77.92	4.2.4 Healthy life expectancy at birth	25	83.52
2.2.3 Professionals	10	65.92	<i>3rd sub-pillar: SDG Contribution</i>		
2.2.4 Technicians and associate professionals	7	84.06	4.3.1 Access to basic services	18	99.64
2.2.5 Extent of staff training	9	80.65	4.3.2 Pollution	2	99.83
2.2.6 R&D expenditure by businesses	10	45.74	4.3.3 Road safety	13	93.75
<i>3rd sub-pillar: Governments</i>			4.3.4 Reading proficiency in schools	5	99.08
2.3.1 Government online services	8	96.16	4.3.5 Maths proficiency in schools	11	83.66
2.3.2 Publication and use of open data	21	55.89	4.3.6 Use of clean fuels and technology	1	100.00
2.3.3 ICT use and government efficiency	11	78.93			
2.3.4 R&D expenditure by governments and higher education	4	85.59			

* 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>