



NORDIC COUNTRIES

Building on Broadband Momentum:
Toward Ubiquitous Connectivity





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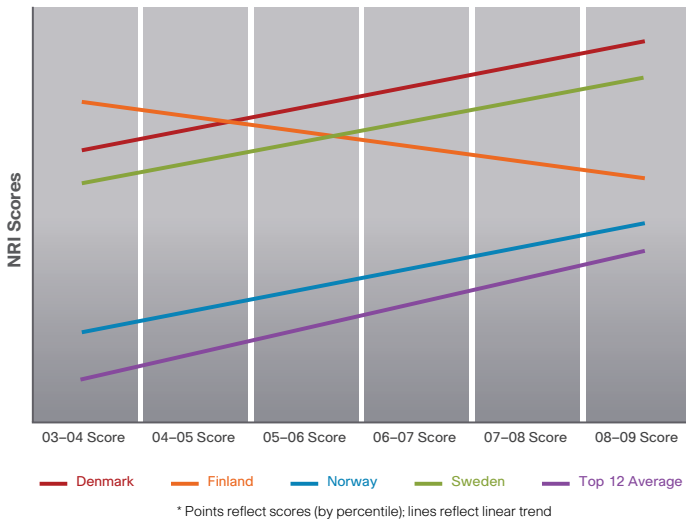
High-speed networks have become part of the basic infrastructure of any country and, as the foundation of the knowledge economy, they may help to power recovery from the current economic crisis. For countries that already have a strong foundation of Information and Communications Technology (ICT) development, broadband and ubiquitous connectivity offer a new frontier of growth, competitiveness, and social welfare.

Today's high-speed networking enables new collaboration at a new and more profound level, providing the ability to dramatically improve human interaction, innovation and operational excellence.

To measure national ability to improve quality of life through high-speed networking, Cisco Systems, Inc. sponsors the Global Information Technology Report (GITR) produced jointly by the World Economic Forum and INSEAD. This report and its Networked Readiness Index (NRI) provide an excellent opportunity to take stock of where countries stand in the race to harness the potential of ICT in general and broadband in particular.

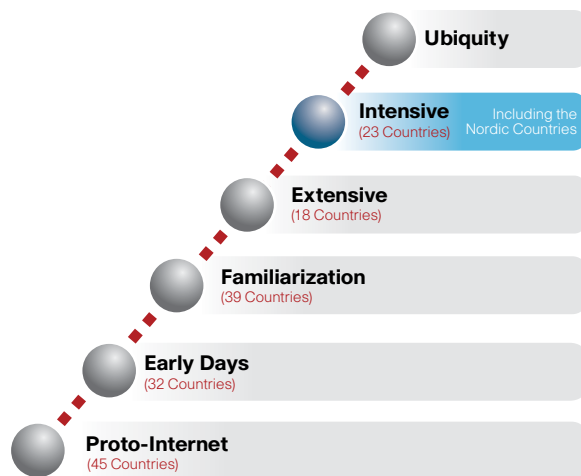
The “league table” based on the NRI usually earns the headlines and the Nordic countries are featured prominently as they place near the top (this year Denmark and Sweden ranked first and second, while Finland and Norway stand at sixth and eighth out of 134 countries ranked). However, NRI scores and their trends convey still more information. As the chart below illustrates, networking scores in Denmark, Sweden and Norway have kept pace with the 12 countries with the best practice ICT environments (including the Nordics, see below). However, Finland’s scores have not. Remaining at the top in today’s fluid technology innovation and adoption environment poses a formidable challenge for these countries during the years ahead.

To provide greater perspective on a country’s ICT development, we rely on a new edition of the “ICT Development Map” and on the novel analysis of “Internet Stages” included in this year’s GITR. These two models were developed by Cisco to better understand the situation of most countries compared with its peers— benchmarking each country against other countries with best practice ICT Development positions provides reference points and a direction for developing a strategy toward ubiquity. Combining the two models with a review of recent progress in broadband penetration, we can derive not only a set of diagnostics but also a vantage point from which to chart a course to improved network connectivity.



The Internet Stages

Each Internet Stage focuses on one or more key thresholds achieved toward nationwide connectivity. Placing an individual country in this context provides a useful perspective on where it stands on the path to making the benefits of broadband access to Internet widely available to business and citizens.



The Nordics, not surprisingly, are in the *Intensive* stage of Internet connectivity.

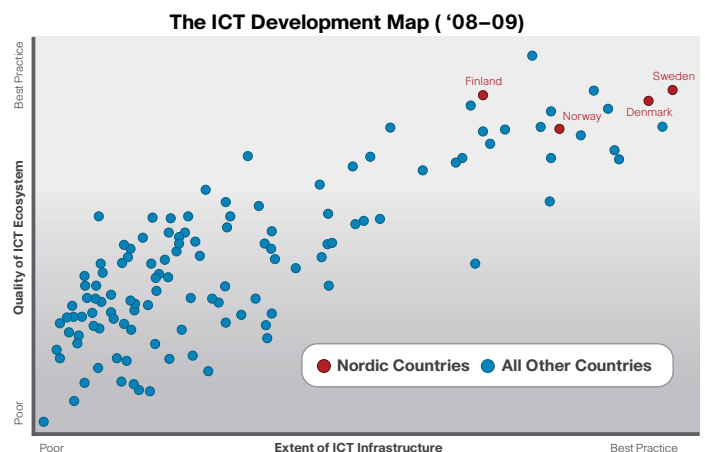
Countries in this stage generally have half or more of all households (plus all businesses and institutions) with a broadband connection. These are mostly advanced economies in which, on average, two-thirds of the population already uses the Internet. E-commerce, e-government services, business collaboration, social networking, and other services, are pervasive and have become an integral part of the social fabric and economy. This is the jumping-off point for Internet ubiquity, which requires a strong foundation and dynamic technology adoption.

The ICT Development Map

The stages previously identified help us to understand the critical mass thresholds needed to accelerate network connectivity. To complement the diagnostic of a country’s ICT development, we can use the ICT Map, which explores the interaction between ICT infrastructure and ecosystem coordinates and technology adoption, relying on data behind the NRI.¹

- *The ICT ecosystem* refers to institutional factors that underlie entrepreneurial creativity and competitive dynamics for service provision. These factors are hard to measure, but include the legal and regulatory framework around ICT deployment and the general ease of doing business.
- *ICT infrastructure and capacity* refer to assets, such as networks and other infrastructure, as well as the existence of skills to use and manage the hardware effectively.

Revisiting the ICT Map with information from the 2008–09 NRI, we can position the 127 economies for which data are available, including the Nordics, against the two dimensions of ICT infrastructure and ecosystem.



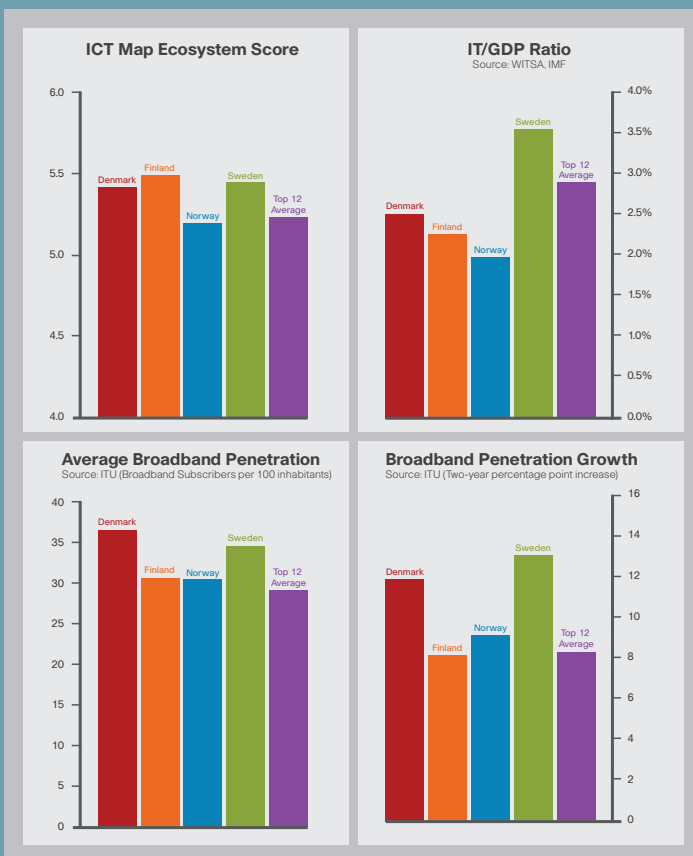
¹Data included in the NRI are generally for 2007. While there may be more recent data for individual countries, using NRI data helps to ensure comparability across countries.

While the Nordics' position is the envy of most other countries, not all of them are "best practice" in both dimensions. The ecosystem rating for this region is certainly at best practice levels, but the infrastructure rating is less so except in Denmark and Sweden. This strong ecosystem foundation suggests that there is a high potential pay-off from investment in ICT infrastructure to further accelerate technology adoption and provide a foundation for ubiquity evolution.

Comparing the Nordics' ecosystem rating with the top 12 ICT environments highlights the strength of their regulatory, business and market environment. An insight into the infrastructure

dimension can be derived from comparison of IT expenditure as a percentage of GDP.² With regard to this possible leading indicator, only Sweden is clearly above the top 12 average and Norway is significantly below.

This analysis of the ecosystem and infrastructure dimensions looks at ICT broadly (as an important foundation). However, increasingly the focus needs to be on broadband adoption and deployment. Broadband is the key driver of the many benefits of connectivity and, hence, it is useful to focus on trends in broadband penetration and how they are influenced by ICT Map positions.



²The top 12 comparator group consists of the 12 countries with the best combined infrastructure and ecosystem environments: Belgium, Canada, Denmark, Estonia, Hong Kong, Iceland, Luxembourg, Netherlands, Norway, Sweden, Switzerland and the U.K.





Broadband penetration in the Nordic countries Looking at the dynamics also paints an encouraging picture. The period between 2005 and 2007 was a time of significant expansion of Internet usage around the world (possibly a key inflection point in that regard). An analysis of broadband penetration over that two-year period confirms the value of the balance between infrastructure and ecosystem, as countries along the diagonal (indicative of balance between progress on the ecosystem and infrastructure fronts) saw the greatest increase in broadband line penetration. In this context, the Nordics' increase in broadband penetration—particularly Denmark and Sweden—outpaces even the top 12 average.

The Nordic countries so far have been successful in their efforts with connectivity at the intensive stage. They now face a game-changing challenge as they attempt to cross the final threshold into ubiquitous connectivity. Continued efforts to maintain ecosystem responsiveness will be a test of their stamina as technology keeps evolving and they reach the next phase of strategic investments to expand and improve the quality of broadband. As the Nordics continue to harness the potential of broadband networks for

national competitiveness and social inclusion, it is critical to remedy any weaknesses in the ICT ecosystem, infrastructure or both.

A new era has dawned as Internet use crosses critical mass thresholds across the world and technology expands the range of connectivity options. The emergence of the Web 2.0 era of technology-powered innovation has coincided with a major financial crisis that is bound to result in major global economic restructuring. Countries will see major benefits if they understand the power of broadband networks and are able to implement strategies to seize the moment. Not only will they improve national competitiveness across sectors, but they will also turn the crisis into an opportunity for new growth—driven by the knowledge economy—with a major, lasting impact on the country's welfare. The Nordics face the added challenge of having maintaining their top position as the rest of the world attempts to catch up and surpass their current achievements.

You can view the 2008/09 Global Information Technology Report beginning 1 100 CET, 26 March 2009 at the following link: <http://www.weforum.org/gitr>

This note is intended to contribute to the discussion of strategies to harness the potential of broadband and high-speed networks in pursuit of economic and social goals. It was prepared by Enrique Rueda-Sabater and John Garrity from Cisco Systems, Inc. and draws primarily on data included in the 2008-09 GITR. For details on the Stages, ICT Map and Net Strategy Framework used in this note, please see *From Mobility to Ubiquity: Ensuring the Power and Promise of Internet Connectivity*—a chapter in the same GITR.



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