

# Executive Summary

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Part 1 of the 2016 edition of *The Global Information Technology Report* assesses the state of networked readiness of 139 economies using the Networked Readiness Index (NRI) (Chapter 1.1) and, under the theme “Innovating in the Digital Economy,” examines the role of information and communication technologies (ICTs) in driving innovation (Chapters 1.1 and 1.2). Part 2 consists of an extensive data compendium with the detailed performance of each economy in the NRI (Section 2.1) and rankings for each of the 53 individual indicators included in the NRI (Section 2.2).

## PART 1: INNOVATING IN THE DIGITAL ECONOMY

We are at the dawn of the Fourth Industrial Revolution, which represents a transition to a new set of systems, bringing together digital, biological, and physical technologies in new and powerful combinations. These new systems are being built on the infrastructure of the digital revolution. *The Global Information Technology Report 2016* features the latest iteration of the NRI, which assesses countries’ preparedness to reap the benefits of emerging technologies and to capitalize on the opportunities presented by the digital revolution and beyond.

### The Networked Readiness Index 2016

Chapter 1.1 presents the results of the NRI 2016, which measures the capacity of countries to leverage ICTs for increased competitiveness and well-being. It also considers innovation trends of recent years through the lens of the NRI.

### The networked readiness framework

The networked readiness framework rests on six principles: (1) a high-quality regulatory and business environment is critical in order to fully leverage ICTs and generate impact; (2) ICT readiness—as measured by ICT affordability, skills, and infrastructure—is a pre-condition to generating impact; (3) fully leveraging ICTs requires a society-wide effort: the government, the business sector, and the population at large each have a critical role to play; (4) ICT use should not be an end in itself. The impact that ICTs actually have on the economy and society is what ultimately matters; (5) the set of drivers—the environment, readiness, and usage—interact, co-evolve, and reinforce each other to form a virtuous cycle;

and (6) the networked readiness framework should provide clear policy guidance.

The framework translates into the NRI, a composite indicator made up of four main categories (subindexes), 10 subcategories (pillars), and 53 individual indicators distributed across the different pillars:

#### A. Environment subindex

1. Political and regulatory environment (9 indicators)
2. Business and innovation environment (9 indicators)

#### B. Readiness subindex

3. Infrastructure (4 indicators)
4. Affordability (3 indicators)
5. Skills (4 indicators)

#### C. Usage subindex

6. Individual usage (7 indicators)
7. Business usage (6 indicators)
8. Government usage (3 indicators)

#### D. Impact subindex

9. Economic impacts (4 indicators)
10. Social impacts (4 indicators)

The computation of the overall NRI score is based on successive aggregations of scores: individual indicators are aggregated to obtain pillar scores, which are then combined to obtain subindex scores. Subindex scores are in turn combined to produce a country’s overall NRI score. The appendix of Chapter 1.1 presents the detailed methodology and composition of the NRI.

About half of the individual indicators used in the NRI are sourced from international organizations. The main providers are the International Telecommunication Union, UNESCO and other UN agencies, and the World Bank. The other half of the NRI indicators are derived from the World Economic Forum’s Executive Opinion Survey (the Survey). The Survey is used to measure concepts that are qualitative in nature or for which internationally comparable statistics are not available for enough countries. The 2015 edition of the Survey was completed by over 14,000 business executives in more than 140 countries.

### Key Findings

Under the theme “Innovating in the Digital Economy,” *The Global Information Technology Report 2016* highlights the ways in which the digital revolution is changing both the nature of innovation and the rising pressure for firms to innovate continuously. The analysis yields four key findings:

**Key Finding 1: The digital revolution changes the nature of innovation.** One of the key characteristics of the digital revolution is that it is nurtured by a different type of innovation, increasingly based on digital technologies and on the new business models it allows. In addition to making traditional research tools more powerful, it allows for new and near-costless types of innovation that require little or no R&D effort. Examples include the digitization of existing products and processes, distributed manufacturing, blockchains, and advertising-based “free services” as well as the prospect of more “uberized” activities in multiple sectors, including transport, banking, entertainment, and education.

The NRI data show that the minds of business executives around the world are increasingly focused on innovation, as reflected by the steady upward trend in firms’ perceived capacity to innovate. Traditional measures for innovation, such as the number of patents registered, are picking up only part of the story. Instead, new types of innovation, such as business-model innovation, look set to become an important part of the innovation story: executives in almost 100 countries report increases in the perceived impact of ICTs on business-model innovation compared with last year.

**Key Finding 2: Firms will face increasing pressure to innovate continuously.** Seven countries stand out in terms of economic and digital innovation impact: Finland, Switzerland, Sweden, Israel, Singapore, the Netherlands, and the United States. Considering the different elements of networked readiness for these seven countries, it is noticeable that all seven are characterized by very high levels of business ICT adoption. This technology-enabled innovation in turn unleashes new competitive pressures that call for yet more innovation by tech and non-tech firms alike.

Because digital technologies are driving winner-take-all dynamics for an increasing number of industries, getting there first matters. However, although firms feel that overall capacity to innovate has increased, a stagnating rate of ICT adoption and usage by existing firms across all regions suggests that a large number of firms are not getting into the game fast enough.

**Key Finding 3: Businesses and governments are missing out on a rapidly growing digital population.** In recent years, digital innovation has been primarily driven by consumer demand. Yet this increasing demand for digital products and services by a global

consumer base is largely being met by a relatively small number of companies. Businesses need to act now and adopt digital technologies to capture their part of this growing market. A widening and worrying gap is also emerging between growth in individual ICT usage and public-sector engagement in the digital economy, as government usage is increasingly falling short of expectations. Governments can do more to invest in innovative digital solutions to drive social impact.

**Key Finding 4: A new economy is shaping, requiring urgent innovations in governance and regulation.**

As the new digital economy is taking shape, offering it the right framework conditions will be crucial to ensuring its sustainability. Digital technologies are unleashing new economic and social dynamics that will need to be managed if the digital transformation of industries and societies are to deliver long-term and broad-based gains. A resilient digital economy also calls for new types of leadership, governance, and behaviors. A critical ingredient for the success and sustainability of the emerging system will be agile governance frameworks that allow societies to anticipate and shape the impact of emerging technologies and react quickly to changing circumstances.

### Networked Readiness Index 2016: Results overview

Chapter 1.1 then reports the rankings of the overall NRI 2016, its four subindexes, and their respective pillars.

The composition of the group of top 10 performers is unchanged from last year. The group consists of a mix of high-income Southeast Asian (Singapore and Japan) and European countries (Finland, Sweden, Norway, the Netherlands, Switzerland, the United Kingdom, and Luxembourg) as well as the United States. Networked readiness therefore remains highly correlated with per capita income.

**Europe** remains at the technology frontier with seven out of the top 10 NRI countries being European. Yet the performance range is wide, with Greece dropping four places to 70th position and Bosnia and Herzegovina closing the group at 97. Several Eastern European countries—notably the Slovak Republic, Poland, and the Czech Republic—are making big strides, landing spots in the top 50 of the NRI; better affordability and large improvements in economic and social impacts are contributing to this success in these three countries in a major way. Italy is another notable mover this year, improving 10 places to reach 45th position as economic and social impacts of ICTs are starting to be realized (up 18 in the global impact rankings).

The **Eurasia region** continues its upward trajectory, with the average NRI score for the region increasing significantly since 2012. In particular, it is notable that the improvement is observed across all four elements that make up the Index: Environment, Readiness, Usage, and Impact. The region is led by Kazakhstan, which

continues on its positive trajectory of recent years to land in 39th position this year.

Leading the **Emerging and Developing Asian** economies in 2016 is Malaysia, which continues to perform strongly and moves up one spot to 31st position overall; this performance is supported by a government that is fully committed to the digital agenda. The top five in the region in terms of overall ICT readiness remain China, Malaysia, Mongolia, Sri Lanka, and Thailand, as in 2015. The group of Emerging and Developing Asian countries has been both moving up and converging since 2012. Individual usage in the region is still one of the lowest in the world, but has been growing strongly in recent years.

The performance range of countries in the **Latin America and Caribbean region** remains widely dispersed with almost 100 places between Chile (38th) and Haiti (137th). There was no clear trend from 2015 to 2016 in terms of relative performance, with Chile and Haiti staying put; of the remaining group, half of the countries improve their ranking and the other half drop. Considering the absolute NRI score, however, the region has been moving up and converging since 2012. In order to foster the innovation forces that are key for thriving in the digitized world and the emerging Fourth Industrial Revolution, many governments in the region will urgently need to reinforce efforts to improve the regulatory and innovation environment in their countries.

The UAE (26th) and Qatar (27th) continue to lead the Arab world when it comes to networked readiness. The **MENAP region** (Middle East, North Africa, and Pakistan) is home to two of the biggest movers in this year's rankings: Kuwait (61st, up 11) and Lebanon (88th, also up 11). In both cases, individuals are leading the charge with the business sector catching up and strongly contributing to the successful performance. Although governments are lagging behind in terms of digital adoption (81st in Kuwait, 124th in Lebanon), the business community in both countries is registering an increased weight on ICTs in government vision and efforts to improve the regulatory environment.

This year's NRI also sees several **sub-Saharan African** countries among the top upward movers, including South Africa (65th, up 10), Ethiopia (120th, up 10), and Côte d'Ivoire (106th, up 9). Leadership in terms of digital adoption is coming from different groups of stakeholders. Although efforts are very much government-driven in Ethiopia and Côte d'Ivoire, the business sector is providing the most momentum in South Africa. Going forward, the largest barriers to tackle for Côte d'Ivoire will be infrastructure and affordability; reversing the trend of a deteriorating business and innovation environment for South Africa; and individual usage and skills for Ethiopia.

Chapter 1.1 provides an overview of the performance of the 10 best-performing countries in the NRI 2016, a selection of economies that were among

the top movers as well as other selected economies, including members of the G20 outside the top 10.

The Index maps a quickly evolving space and has been adapted since its inception in 2001. Since the digital economy is developing exponentially, its measurement must be adapted to reflect the new realities on the ground. A multi-stakeholder process will be put in place to identify key questions concerning the drivers and implications of the emerging Fourth Industrial Revolution and to develop relevant concepts and measures with a view to incorporating these findings into the next edition of the NRI.

### Cross-border data flows, digital innovation, and economic growth

In Chapter 1.2, Robert Pepper, John Garrity, and Connie LaSalle explore the impact of the free flow of data across national borders on innovation and growth. The authors highlight the development of cross-border data traffic over Internet protocol, starting with the first email messages in the early days of the Internet to today, where over 3.2 billion people across the world have access to and use the Internet.

The flow of digital communication between countries, companies, and citizens has been recognized for years as a critical driver of economic growth and productivity. Countries adept at fostering digital activity have witnessed the emergence of new industries as well as the accelerated development of traditional sectors. However, despite the intensive and extensive growth of the global Internet, concerns over growing barriers to digital flows are mounting.

The authors first review the literature on the impact of cross-border data flows on countries, companies, and individuals. The chapter then presents an original analysis of the growth of new services built on the free flow of trade through global digitization, and concludes by discussing policy guidelines that mitigate concerns over national data transmission while simultaneously maximizing the benefits of cross-border data flows.

### PART 2: DATA PRESENTATION

Part 2 of the *Report* contains individual scorecards detailing the performance in the Networked Readiness Index of each of the 139 economies (Section 2.1) and tables reporting the global rankings for each of the 53 individual indicators composing the NRI (Section 2.2).