
Preface

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Information and communication technologies (ICT) has played a central role in fostering innovation and development of societies and economies. Not only has ICT increased productivity significantly in a variety of ways and therefore driven sustainable growth, but it has also provided people all over the world with better opportunities to improve their life conditions and their businesses. The Internet has brought about a revolution in businesses, education provision, and ways of interacting on a global scale, by offering each one of us, in the developed and developing world, unprecedented access to information and knowledge. In addition, especially through the Web 2.0 technologies, it has made the world smaller, facilitating the development of virtual communities and social networks, and nurturing information and experience sharing among individuals separated by geography.

The advances enabled by telecommunications are just as impressive, with mobile telephony providing small businesses and farmers in remote communities with access to new markets and real-time information on commodities prices, or creating new forms of entrepreneurship among the poor, as in case of the Grameen phones in Bangladesh. Further, mobile telephony has radically changed communication patterns among individuals more generally, be they busy executives conducting business over the BlackBerry on their way to the airport, or teenagers exchanging SMS messages.

The extraordinary power of ICT to enable growth, reduce poverty, and improve citizens' lives has become increasingly clear to policymakers and civil society alike, and ICT promotion has gradually found a more privileged place in national competitiveness strategies and policy agendas. The example of countries such as Singapore, Estonia, and Israel has shown how ICT can be the enabler of a competitive transformation of the economy, allowing countries to leapfrog to more advanced stages of development as well as production and export structures.

At the World Economic Forum, we have long understood the importance of innovation and ICT for national competitiveness and have contributed, over the years, to raising public awareness on the subject through our research and activities, especially with the *Global Information Technology Report* (GITR) series, in partnership with INSEAD. The GITR series, published annually since 2001, lays out a broad framework—the Networked Readiness Index (NRI)—identifying the enabling factors

for countries to leverage ICT developments, with a particular focus on the role of the three main social actors: individuals, businesses, and governments. The NRI provides a unique benchmarking instrument for economies to monitor their progress over time and vis-à-vis relevant comparators, and has turned into an authoritative platform for policymakers, business leaders, and other relevant stakeholders to discuss and elaborate national roadmaps toward increased networked readiness and competitiveness.

The Global Information Technology Report 2007–2008, the seventh in the series, includes the latest findings of our research, providing once again a comprehensive networked readiness snapshot of the world. In line with our continuing effort to expand the coverage of the *Report*, a record number of 127 economies has been assessed this year, accounting for more than 95 percent of the world's GDP. Also featured in the *Report* is an extensive section of data tables with global rankings covering nearly 70 indicators, together with a number of essays and case studies on notable trends and issues in networked readiness, and on national ICT development stories of particular interest.

We would like to express our gratitude to the eminent academics and practitioners who contributed insightful papers to this *Report*, casting light on important ICT developments and showcasing best practices and policies in ICT diffusion. We especially wish to thank the editors of the *Report*, Soumitra Dutta at INSEAD and Irene Mia at the World Economic Forum, for their energy and long-lasting dedication to the project. Appreciation also goes to Fiona Paua, who heads the Strategic Insights Teams, and the other members of the Global Competitiveness Network: Jennifer Blanke, Ciara Browne, Agustina Ciocia, Margareta Drzeniek Hanouz, Thierry Geiger, Pearl Samandari, and Eva Trujillo Herrera. Last but not least, we would like to commend our network of 142 Partner Institutes worldwide, without whose enthusiasm and hard work the annual administration of the Executive Opinion Survey and this *Report* would not be possible.

Executive Summary

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The world is becoming more networked with the passing of each day. Not only are the number of interconnections amongst individuals, businesses, and governments increasing, but there is also increased recognition of connectivity as a key component of public infrastructure in general.¹ New definitions portray high bandwidth connectivity as a necessity, perhaps even a public utility on the order of drinking water. For instance, the Chicago Digital Access Alliance has promoted the notion of universal broadband access as a public right.² Similar statements by the European Commission present high bandwidth connectivity as a service of general economic interest.³ Providers have also jumped on the bandwagon of broadband as a “universal service.” For example, in October 2007, the UK Post Office launched a new service specifically designed to attract late adopters of broadband services.

Next-generation technologies such as WiFi and WiMAX are being adopted rapidly and are enhancing connectivity. WiFi has quickly evolved from a WLAN application, providing indoor, short-range wireless Internet access for mobile computers, to a broadband wireless service with many opportunities on a global scale. According to estimates provided by local authorities in North America, in a typical city, at least 45 percent of the municipal employees are mobile. Police, fire, public works, parks, and inspections departments are out daily and need to access information. Therefore, cities across the United States and Canada have been setting up networks to allow wireless connections.

Many developing countries are using WiMAX deployments to leapfrog past copper wire. By early 2007, Motorola and Wateen Telecom, a subsidiary of UAE-based Warid Telecom, had rolled out a WiMAX network in 17 major cities across Pakistan.⁴ In India, WiMAX is publicized as 30 times faster than 3G mobile technology and 100 times faster than wireless data rates, and has been widely anticipated to cure the problems of rural connectivity. It has been promoted as the answer to India’s last-mile connectivity issues, which have hampered Internet take-up in rural India. In the context of having to apportion chunks of finite spectrum, WiMAX is appealing because it holds the promise of increased sharing. Rural connectivity is promised as long as power supply is available, PCs are given, local languages are used in developing content, and people are provided with training in using PCs.⁵

The benefits of increased connectivity in areas such as better and more diverse access to information have been documented qualitatively in the literature. In large measure, they have contributed to digital literacy and fluency, as a platform for human capital growth that requires public investment.⁶ There are other, less tangible but equally crucial benefits of increased connectivity: in a wider social context, connectivity has been recognized as having a positive impact on transparency, good governance, and democracy. There are also implications of increased connectivity that are currently in the process of being defined, particularly in areas such as urban systems, lifestyles, and quality of life. For example, according to a 2006 technology needs assessment and economic development impact study conducted in the United States for the city of Saint Paul, amidst intensifying global competition for talent, high bandwidth connectivity has the ability to enhance the city’s appeal to the “creative class” of knowledge workers.⁷

Across the world, increased connectivity has also become a prominent factor in the discourse on strengthening and maintaining social cohesion. Narrowing the digital gap between urban and rural areas has been a priority for public sectors worldwide, regardless of their countries’ overall information and communication technologies (ICT) maturity. This agenda has served to placate fears that the rapid advances in technology would benefit urban areas at the expense of those geographic segments that are already struggling with their distance from markets. Indeed, there has been differentiation in governments’ perspectives on the benefits of connectivity proliferation along the lines of central, regional, and municipal government.

The Global Information Technology Report 2007–2008 is released at a time in which the importance of high-bandwidth connectivity for countries’ competitiveness, sustained growth, and poverty reduction is widely recognized. Facilitating access and effective use of ICT has increasingly moved to the top of national agendas in most developed and developing economies, while more resources are invested in ICT infrastructure upgrading and development. The *Report* is the seventh of a series and builds on a long-term partnership between the World Economic Forum and INSEAD, aimed at furthering understanding of networked readiness and its main enablers.

The *Report* features four thematic parts. Part 1 includes the findings of the Networked Readiness Index (NRI) 2007–2008, together with a number of insightful essays on selected issues of networked readiness, with a specific focus on how it can foster innovation. Topics covered stretch from the link between innovation and ICT to recent trends in innovation (such as Unified Communications) and e-skills and telecommunications regulation in emerging markets.

Part 2 focuses on country/regional case studies showcasing best policies and practices in fostering networked readiness. This year, Singapore, Qatar, and EU cases are analyzed in depth.

Part 3 provides detailed profiles for each of the 127 economies covered in the *Report*, presenting a comprehensive snapshot of each economy's current networked readiness status and allowing for international and historical comparison on specific variables or components of the NRI.

Last but not least, Part 4 provides detailed data tables for each of the 68 variables composing the NRI this year, with global rankings.

Part 1: Selected Issues of Networked

Each year, *The Global Information Technology Report* includes a deep-dive analysis on issues with a particular relevance for countries' networked readiness, together with a report on the latest NRI findings. This year we examine the following specific areas: (1) the emerging nexus delivering the promises of ICT to developing countries; (2) the impact of ICT on innovation; (3) the new, current innovation modalities at the “speed of light”; (4) Unified Communications; (5) the development of e-skills for the information age; (6) regulations in emerging telecommunications markets; (7) business network transformation and their implications for the global economy; and (8) innovation and collaboration on the participative Web.

The Networked Readiness Index

Chapter 1.1, “Assessing the State of the World's Networked Readiness: Insight from the Networked Readiness Index 2007–2008,” reports the latest results and findings of the NRI, the main outcome of a research project jointly conducted by the World Economic Forum and INSEAD since 2002. The NRI aims at measuring economies' capacity to fully leverage ICT for increased competitiveness and development, building on a mixture of hard data collected by well-respected international organizations, such as the International Telecommunication Union (ITU), the World Bank, and the United Nations, and survey data from the Executive Opinion Survey, conducted annually by the World Economic Forum in each of the economies included in the *Report*. The NRI 2007–2008 covers a record number of 127 developed and developing

economies all over the world, accounting for over 95 percent of the world GDP.

The Networked Readiness Framework, underlying the NRI and unchanged since 2002, assesses:

- the presence of an ICT-friendly and conducive environment, by looking at a number of features of the broad business environment, some regulatory aspects, and the soft and hard infrastructure for ICT;
- the level of ICT readiness and preparation to use ICT of the three main national stakeholders—individuals, the business sector, and the government; and
- the actual use of ICT by the above three stakeholders.

The NRI rankings for 2007–2008 confirm Denmark as the most networked economy in the world for the second year consecutively, as a culmination of an upward trend observed since 2003. The other Nordic countries also continue to show their prowess in leveraging ICT for increased competitiveness, with Sweden, Finland, Iceland, and Norway at 2nd, 6th, 8th, and 10th position, respectively. Among the top 20, Switzerland is up two places, at 3rd position, continuing last year's notable upward trend, while the United States improves three ranks to 4th place. Korea, at 9th, realizes one of the most impressive improvements (10 places) from last year among the 127 economies covered by the *Report*. Other Asian economies featured in the top 20 are: Singapore (5th), Hong Kong (11th), Australia (14th), Taiwan (17th), and Japan (19th). With regard to the largest Asian emerging markets, India is down four places in a constant sample at position 50th, while China is improving five positions in a constant sample to 57th.

The networked readiness snapshot for Latin America and the Caribbean this year appears less positive than it did in 2006–07, with Mexico (58th), Brazil (59th), and Argentina (77th) all dropping a number of positions, and only four economies among the top 50: Chile (34th), Barbados (38th), new entrant Puerto Rico (39th), and Jamaica (46th).

Notwithstanding the important advances sub-Saharan Africa experienced in the last decade or so in ICT penetration, the large majority of the region continues to lag behind in the NRI ranking this year, with only South Africa (51st) and Mauritius (54th) featured in the first half of the rankings.

The picture for North Africa is more positive, with Egypt and Morocco posting an impressive 17-place (the highest in the sample) and 5-place improvement, respectively, in a constant sample, climbing to 63rd and 74th. Also most of the countries in the Middle East realized important advancements in the rankings, with Qatar (32nd), Bahrain (45th), and Jordan (47th) at the

forefront, with a remarkable 4-, 6-, and 11-place rise, respectively, in a constant sample.

The chapter also features a trend analysis of the entire NRI time-series, identifying the countries and regions in the world that have progressed the most in the NRI rankings since 2001, proving themselves to be particularly dynamic in benefiting from ICT advances.

Mapping out a balanced path for developing countries in leveraging ICT

Establishing a pervasive and prosperous Internet culture is as much about creating the right business environment as it is about adopting the right technology. If governments—national, regional, and municipal—want to harness the potential of ICT, they must not only invest in ICT infrastructure and the capabilities to support it, but also be ready to modify their country’s relevant institutional setting—or ICT ecosystem—to allow ICT to yield its transformative powers. In their paper “The Emerging Nexus: Now Is the Time to Plot a Balanced Course that Delivers on the Promise of ICT,” authors Ewan Morrison, Robert Pepper, and Enrique J. Rueda-Sabater (all at Cisco Systems, Inc.) introduce a diagnostic framework reflecting those two dimensions along with a mapping tool employing NRI component indicators. The aim is to allow countries to gain insight into how to chart a balanced path between ICT infrastructure and ecosystem initiatives that serves their own mix of social inclusion and economic growth objectives.

The framework provides “map” coordinates that illustrate the best path forward to ensure that investment in infrastructure and capacity are matched with a good institutional ecosystem for ICT. Understanding a country’s position with respect to these factors is, thus, a good basis for mapping out steps toward improved ICT adoption and IP network connectivity. The two dimensions in question are:

- *ICT ecosystem*, which refers to institutional factors that underpin entrepreneurial creativity, competitive dynamics for service provision, and fairness in the distribution of economic gains. These factors are hard to measure, but the most critical factors pertain to the legal framework around ICT deployment—in particular, the quality of ICT regulations, the ease of doing business in a country, and the existence of lively competition and innovation.
- *ICT infrastructure and capacity*, which refers to assets, such as networks and other telecommunications and connectivity infrastructure, as well as the existence of technical skills and systems capable of effectively managing the infrastructure.

The paper explains in detail how this diagnostic approach works, and provides the authors’ insights after their initial efforts working with the framework.

Why does ICT matter for innovation?

In his paper “The Missing Link: Why Does ICT Matter for Innovation? Exploring the Effect of Information Technology on Innovation-Based Competitiveness,” Adolfo Ibáñez University Professor Carlos A. Osorio-Urzúa explores the relevance of information and communication technologies for innovation from the perspective of how ICT fosters innovation. The relevance of this issue, explains the author, relies on the fact that most nations treat innovation and ICT policy as different areas of concern, missing opportunities for greater and deeper changes.

The paper explores the relationship between innovation and ICT by studying how a slightly adapted version of the innovation subpillar of the Global Competitiveness Index (GCI), featured in the World Economic Forum’s *Global Competitiveness Report*, is related to the NRI, and how, particularly, the use of ICT relates to innovation. Results support the idea that the more intensive and sophisticated the use of ICT, the higher its impact on innovation, even considering important contextual factors such as intellectual property protection, availability of local venture capital, participation of exporting firms on the various stages of their industries’ value chain, and per capita income level. Osorio-Urzúa argues, however, that the relevance of ICT use is different among high- and low-income nations, in line with the view that innovation processes require sophisticated ICT use. While the extent of business Internet use is the most relevant ICT factor related to innovation among high-income nations, low-income nations exhibit a more basic approach, showing that use of ICT by governments and generating access among the population are the most relevant needs that show a relationship with innovation. While high-income nations are in the stage of exploiting ICT for innovation, low-income nations are still building the basic infrastructure to enter that stage. However, the efforts of low-income nations toward fostering ICT access among the poor, mostly as a matter of democratization, can also serve to enhance innovation and be a source of equity and national competitiveness. The right policy to capitalize on this opportunity is to create instruments to incentive and foster grassroots innovation, concludes the author. National competitiveness is based not only on how the firms at the top of the pyramid perform, but also on the performance of those at the bottom. However, most innovation policies in developing nations are designed for globalized firms or sophisticated startups.

Innovation at the speed of life

In his paper “Innovation at the Speed of Life,” Matt Bross (at BT Group) argues that the rapid advances in ICT have unleashed an explosion of innovation and creativity of such power and impact that it is been called the “Innovation Big Bang.”

As a result, consumers now have a bewildering array of products and services they can choose from. And if they still cannot find what they want, they don't have to worry since innovations are being brought to market at an unprecedented rate. For every firm, the challenge is immense. To stay in the game, it must open its innovation process, enlisting the help of as many as it can, and not just those on its payroll.

However, the author believes, openness itself is not enough. Innovations must now be delivered at the speed of customers' personal and professional lives, eliminating the gap between what they are looking for and what they can have. Fortunately, an array of technology-enabled options is already available to help firms open their innovation processes and accelerate the delivery of ideas to market. With more yet to come, firms are now free to choose how open and agile an innovator they want to be. In this context, Bross notices that the world is full of people who are keen to offer their ideas, and firms need to become exceptional exploiters of this immense pool of talent if they are to survive. By creating opportunities for many more people to participate in the innovation process and share the wealth that is created, Bross believes open innovation will help overcome the digital divide.

Unified Communications

One of the traditional benchmarks of a nation's ability to foster economic growth and protect and enhance the well-being of its citizens has been good communications. As communications technology has advanced, nations need to reconsider what "good" communications is.

In their paper "Unified Communications: Leading Advances in Global Decision Making and Economic Development," Sandor Boyson (Robert H. Smith School of Business, University of Maryland, College Park) and David Boyer (Avaya) provide a compelling account of the development and diffusion of digital platforms that unify what have until now been separate communications channels, that is, Unified Communications (UC). Indeed, convergence has created a UC network, a revolutionary services platform capable of orchestrating processes and people on a scale never seen before. Unified Communications can bring people and their expertise into business and government processes as needed, through better communications.

The paper argues that we must go beyond the present framework of communications to Unified Communications—enabling social and business collaboration. *Unified Communications* can be defined as communications integrated to optimize business processes. The authors believe that nations urgently require a bold set of adjustments in public and private strategy to harness Unified Communications as a catalyst to new economic and social development. The key to national success will lie in mobilizing cross-boundary collaborations and partnerships cutting across government and industry borders to ensure the growth of the open standards,

business process definitions and governance mechanisms that will be needed to propel Unified Communications forward. To attain success, a broad coalition of leaders must become energized by the potential of Unified Communications and committed to its rapid scale-up and diffusion across society.

Leaders should formulate and steer a multifaceted policy agenda to take advantage of Unified Communications' ability to improve public- and private-sector processes. With these policies in place, the authors are confident that nations will be ready to catch at its peak the next great technology-driven long wave of economic growth.

E-skills for the information age

As global competition becomes increasingly knowledge-intensive, many warning signs tell public and private decision makers that our economies may not be generating the appropriate volumes and levels of e-skills. "Building E-skills for the Information Age," by Bruno Lanvin (INSEAD, eLab) and Pamela S. Passman (Microsoft Corporation), addresses three main issues against the background of the parallel quest for innovation, competitiveness, and employability: (1) why (and how fast) the need for e-skills is growing; (2) how the supply of such skills is generated and is meeting current and foreseeable needs; and (3) what are some of the main priorities that governments and business should address to solve the upcoming "e-skills crunch."

Available evidence confirms that e-skills are pervasive and not limited to IT specialists; they are increasingly required in all sectors and at all levels of activity in which creativity, innovation, and interdisciplinary teamwork are required as tools for competitiveness. In both the private and public sectors, leaders need not only to be e-literate, but also to display and nurture the new qualities required by "e-leadership." Moreover, the authors argue, the emerging global knowledge economy will significantly increase the need for more e-skills at all levels (from unspecialized workers to corporate leaders), in all industries (not just the IT sector), and in the public sector. Finally, e-skills will be of central importance in determining workers' vertical and horizontal mobility, and hence the proper functioning of labor markets and adequate employability and inclusion levels. Faced with such needs, our economies fall short of providing the necessary volume and levels of e-skills required. The gap is growing between the ability of existing educational systems to provide e-skilled workers and managers on one hand, and the requirement of knowledge-intensive economies on the other. In a number of industries and regions, this gap is particularly acute, and calls for rapid adjustments in educational systems and improvements to the image of IT jobs. Urgent efforts are required in the legal and regulatory systems that underpin the well-functioning of labor markets.

From a policy point of view, addressing foreseeable e-skills shortages may yield significant side benefits. The authors believe that, with the right mix of strategies and policies and the proper dose of engagement from all major stakeholders, the current lack of e-skills may indeed prove a major opportunity to involve a larger share of the world population in creating, and in benefiting from, a truly inclusive information society.

Regulations in emerging telecommunication markets

In their paper “Rethinking Regulation in Emerging Telecommunications Markets,” authors Scott C. Beardsley, Ilke Bigan, Luis Enriquez, Mehmet Guvendi, Can Kendi, Miguel Lucas, Oleg Timchenko, Sergio Sandoval, and Ashish Sharma (all at McKinsey & Company, Inc.) discuss the fundamental role of regulation in enabling the development of the telecommunications (telecom) industry in emerging markets. A sound regulatory framework, which takes into account specific local market characteristics, will be crucial not only for operators to capture new sources of growth and revenues, but also for governments to build an industry that is a fundamental enabler of economic development.

Designing such a regulatory framework, the authors argue, requires a deep understanding of the specific characteristics and needs of emerging telecom markets. Although they are far from homogeneous, emerging markets typically differ significantly from mature markets in several ways, among them the distribution of their populations, income levels, and industry structures. Developing countries that ignore their local characteristics and borrow regulatory frameworks from more developed countries will fail to create a vibrant sector that serves as engine for the economic development of the country.

The chapter proposes a simple segmentation with three types of emerging markets that have distinct starting points and characteristics. This assessment can be a useful first step toward prioritizing regulatory objectives, proposing adequate policies, and defining a vision for the future industry structure.

Business network transformation and the global economy

In their paper “Business Network Transformation: Rethinking Relationships in a Global Economy,” Henning Kagermann (at SAP AG) and Philip Lay and Geoffrey Moore (both at TCG Advisors) examine how companies are gaining competitive advantage through networked business models by taking advantage of deregulation, access to global markets, and strategic use of technology. They argue that companies are focusing on their strengths and tapping into complementary sources of talent and ideas across the globe to defend themselves against commoditization and disruptive innovation. By working in global business networks, companies spend less on duplication and more on innovation, resulting in higher degrees of differentiation,

greater customer willingness to pay a premium, and thus higher returns on invested capital.

Since innovation happens continuously in business networks, the authors believe that business executives need to shift their companies from “built-to-last” models and recast themselves as “built-to-adapt” organizations, ready to climb the value chain and take on new roles in the business networks. Under this pressure to transform, business leaders are being forced to re-examine long-held assumptions on strategy, structure, systems, and style to coordinate tasks and collaborate better with customers, partners, and even competitors. The paper addresses the right context in which to view this change in business climate, and it analyzes two modes in which business networks operate. It also discusses how business network dynamics evolve as markets emerge, scale, mature, and decline, as well as what core principles or practices can be used as guideposts in the foray out into this new territory of business networks. And, finally, implications of these networked business models for managing investment in ICT systems are explored.

Innovation on the participative Web

The paper “The Participative Web: Innovation and Collaboration,” by Sacha Wunsch-Vincent and Graham Vickery (both at the OECD), describes the rapid growth of user-created content and its increasing role in worldwide communications, and draws out policy implications.

The authors notice that innovation in broadband applications and digital content is an important driver of the digital economy, building on the infrastructure push that has provided widespread high-speed network access. Indeed, the Internet has altered the nature and the economics of information production. Entry barriers for content creation and distribution have declined radically and encouraged broader participation in media production, increased user autonomy, increased diversity, and a shift away from simple passive consumption of broadcasting and other unidirectional models of mass distribution of content. Terms such as the *participative Web* describe an Internet increasingly influenced by intelligent Web services, based on new technologies enabling the user to be a growing contributor to developing, rating, collaborating, and distributing Internet content and developing and customizing Internet applications (user-created content).

The authors argue that the participative Web provides a testing ground for low-cost experimentation with implications for business, organizational and social change far beyond technology. New business and entrepreneurial activity is a major feature of the participative Web, and existing firms are under pressure to make their business models relevant to this new environment. Moreover, the participative Web harbors potential for educational, political, and social objectives.

The authors also highlight a number of business and policy issues to be addressed, such as rising copy-

right disputes among copyright holders, user-created content platforms, and users. User-created content platforms will also have to address privacy concerns of users and regulators as popular platforms may more and more be subject to “phishing” and other cyber-attacks, making user data vulnerable. Content quality, safety on the Internet, and possibly better self-governance of users will be issues with which to deal. Increased concentration among the user-created content platforms and the growing role of gatekeepers will be continuing business and policy issues.

Part 2: Leveraging ICT and Innovation for Competitiveness: Selected Case Studies

This year’s *Report* presents three case studies related to innovation and networked readiness in Singapore, Qatar, and the European Union. It is hoped that these can provide important insight on best policies and practices in view of fully leveraging ICT and innovation for increased competitiveness.

Singapore, an intelligent nation

As a small island nation without natural resources except for its people, ICT is important to Singapore’s growth and a key component of its economic infrastructure. In their paper “Singapore: Building an Intelligent Nation with ICT,” authors Ng Cher Keng, Ong Ling Lee, Tanya Tang (all at the Infocomm Development Authority, Singapore), and Soumitra Dutta (INSEAD) relate the story of Singapore’s ICT journey over the past 26 years, beginning with the introduction of the National Computerisation Plan in 1981 to equip the country with the then-new tools to increase productivity and economic competitiveness. As its computerization efforts bore fruit, the government’s confidence in ICT as an economic enabler grew, along with the ambition to grow Singapore’s ICT capabilities. From equipping the government, the relevant authorities went on to drive nationwide efforts to extend ICT capabilities to the enterprises and the population, wire up and connect the nation with high-speed broadband connectivity, and transform different economic sectors through the use of ICT. Starting from a very low base, Singapore is now host to a vibrant ICT industry and home to a technologically savvy population, argue the authors. This has, in part, been achieved through the formulation and implementation of six ICT master plans, each guided by a developmental theme relevant for the economy then. “An Intelligent Nation, a Global City, powered by ICT” is the vision of Singapore’s latest ICT master plan, Intelligent Nation 2015 (or “iN2015” in short). The role of ICT, as a strategic enabler to enhance national competitiveness and as an industry in itself, underlies iN2015. By harnessing the power of ICT, Singapore aims to develop an inclusive digital society and ensure the continued growth and vitality of its economy.

Singapore’s focus on linking ICT to strategic objectives combined with strong leadership from the very top of the government provides useful insights for other countries as they seek to leverage the potential of ICT for their own development and competitiveness. The paper also highlights two specific areas of ICT deployment where Singapore has achieved world-class excellence: e-government and e-education.

Creating a knowledge-based economy in Qatar

Qatar is one of the richest economies in the world, with a per capita income of over US\$62,000 per person. Despite its enormous wealth, it has only recently started on its journey of modernization, with ICT seen as a key enabler. The aim, through ICT, is to create a core engine for a competitive economy, universalize access to social services, and create a knowledge-based society. In addition, ICT is seen as having a multiplier effect in all sectors, extending the reach of political reforms and helping Qatar to reach its goal of becoming a modern progressive nation. The first major step on this journey was accomplished when, by a Royal Decree in 2004, Qatar’s Supreme Council of ICT (ictQATAR) was formed with a clear and authoritative mandate as both regulator and enabler of Qatar’s ICT sector. ictQATAR has enthusiastically taken on the role of ICT champion for the entire country, and has consistently pushed for an integrated and holistic approach to ICT implementation. It has managed to win cooperation and support from other government agencies and departments.

The effect of the ICT focus is already being felt. In a commendable feat, Qatar is ranked 32nd in the NRI this year. With a full-fledged national ICT plan in place, initiatives are happening on many fronts: policy reforms; steps with regard to security concerns; ICT initiatives in health care, education, e-government, and infrastructure; and deregulation in the telecommunications industry. For Qatar, the journey in ICT has only started. But despite the relatively late start, the country has succeeded in making its mark on the world’s networked readiness map.

In their paper “Qatar: Leveraging Technology to Create a Knowledge-Based Economy in the Middle East,” Hessa Al-Jaber (at ictQATAR) and Soumitra Dutta (at INSEAD) present an overview of the transformation of Qatar into a knowledge economy and a flag-bearer of technology-driven excellence in the entire region. Besides outlining the key strategic initiatives in Qatar’s ICT agenda, the paper also outlines the key implementation hurdles faced by Qatar, and identifies best practices and lessons from the country’s transformation for other nations engaged in similar processes of change.

European SMEs and innovation through ICT

It is clearer than ever that ICT and e-business models are the most important drivers of innovation and competitiveness today. ICT has revolutionized the way business

is currently done and will continue to do so in the future. But ICT can induce substantially higher productivity gains only when accompanied by appropriate organizational changes, innovative e-business models and investment in skills. Nonetheless, the great potential of ICT-enabled innovations and reorganization of business models is still largely underexploited by European small- and medium-sized enterprises (SMEs). Improving the integration and innovative use of ICT by European SMEs, has, therefore, been a major challenge for policymakers over the past years. In her paper “Small- and Medium-Sized Enterprises Hold the Key to European Competitiveness: How to Help Them Innovate through ICT and E-business,” Dana Eleftheriadou, at the European Commission, provides a comprehensive overview of the Commission’s most recent endeavor to improve the effectiveness of SME public policies promoting the innovative use of ICT and the exchange of good practices: the eBusiness Support Network for SMEs (eBSN). This is a “policy intelligence” initiative, which observes policy developments and identifies new trends. Through the eBSN, the author argues, we are witnessing the combination of three major trends: (1) the increasing economic importance of SMEs as key players in implementing the Lisbon Strategy for growth and jobs, as well as their increasing potential to act as global players in the emerging global economy; (2) the incontestable recognition of the merits of ICT and new e-business processes, as major enablers of innovation, productivity, and competitiveness growth; and (3) the strong engagement of governments to stimulate the uptake of ICT, e-business models, and modern management practices by their enterprises, in particular SMEs.

While analyzing in more depth the government engagement to promote e-business models, eBSN witnessed a policy shift from general ICT awareness raising, sponsoring, and co-financing ICT investments and Internet connectivity toward policy instruments that stimulate SMEs to explore the innovation potential of ICT and e-business. More recently, eBSN observed new policy developments, favoring the sectoral policy approach for e-business. Their aim is to support the participation of SMEs in global digital supply chains of specific business sectors. The current proliferation of such sector-specific initiatives among several EU countries needs efficient policy coordination in order to put them in perspective and valorize them at EU level.

Nonetheless, Eleftheriadou notes that the structural complexity of supply chains, particularly for companies dealing with different industry sectors (thus calling for cross-sectoral coordination), represents a major challenge to the sector-specific e-business initiatives. While the consideration of the sectoral characteristics of a value chain is absolutely critical, cross-sectoral requirements should also be identified and addressed, as a next step. Therefore, the harmonization of data exchange models and business processes across different business sectors

will probably be one of the key ICT-related issues in the future, and will feature at the top of the e-business policy agenda in the years to come. As in other policy areas, the author calls for the European Union and Member States to join forces and coordinate relevant e-business policies to gear up European progress toward the Lisbon objectives.

Parts 3 and 4: Country/Economy Profiles and Data Presentation

Parts 3 and 4 include detailed profiles for each of the 127 economies covered in the *Report* and data tables for each of the 68 variables composing the NRI, with global rankings. Each part is preceded by a description of how to interpret the data provided. Technical notes and sources, included at the end of Part 4, provide details on the characteristics and sources of the individual hard variables included in the *Report*.

Notes

- 1 Broadband can be provided as a fixed line or as a wireless connection. DSL and Packet Cable are the most popular types of fixed broadband connectivity options. WLAN (802.11) GSM/GPRS are the more popular wireless broadband modes. WiMax is an emerging wireless mode for broadband.
- 2 CDAA 2007.
- 3 See http://ec.europa.eu/information_society/eeurope/2005/all_about/broadband/index_en.htm.
- 4 PriMetrica 2006.
- 5 Golilath 2006.
- 6 CDAA 2007.
- 7 St. Paul 2006.

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The Networked Readiness Index 2007–2008 rankings

2007–2008 rank	Country/ Economy	Score	2007–2008 rank	Country/ Economy	Score
1	Denmark	5.78	65	Uruguay	3.72
2	Sweden	5.72	66	El Salvador	3.72
3	Switzerland	5.53	67	Azerbaijan	3.72
4	United States	5.49	68	Bulgaria	3.71
5	Singapore	5.49	69	Colombia	3.71
6	Finland	5.47	70	Ukraine	3.69
7	Netherlands	5.44	71	Kazakhstan	3.68
8	Iceland	5.44	72	Russian Federation	3.68
9	Korea, Rep.	5.43	73	Vietnam	3.67
10	Norway	5.38	74	Morocco	3.67
11	Hong Kong SAR	5.31	75	Dominican Republic	3.66
12	United Kingdom	5.30	76	Indonesia	3.60
13	Canada	5.30	77	Argentina	3.59
14	Australia	5.28	78	Botswana	3.59
15	Austria	5.22	79	Sri Lanka	3.58
16	Germany	5.19	80	Guatemala	3.58
17	Taiwan, China	5.18	81	Philippines	3.56
18	Israel	5.18	82	Trinidad and Tobago	3.55
19	Japan	5.14	83	Macedonia, FYR	3.49
20	Estonia	5.12	84	Peru	3.46
21	France	5.11	85	Senegal	3.46
22	New Zealand	5.02	86	Venezuela	3.44
23	Ireland	5.02	87	Mongolia	3.43
24	Luxembourg	4.94	88	Algeria	3.38
25	Belgium	4.92	89	Pakistan	3.37
26	Malaysia	4.82	90	Honduras	3.35
27	Malta	4.61	91	Georgia	3.34
28	Portugal	4.60	92	Kenya	3.34
29	United Arab Emirates	4.55	93	Namibia	3.33
30	Slovenia	4.47	94	Nigeria	3.32
31	Spain	4.47	95	Bosnia and Herzegovina	3.22
32	Qatar	4.42	96	Moldova	3.21
33	Lithuania	4.41	97	Mauritania	3.21
34	Chile	4.35	98	Tajikistan	3.18
35	Tunisia	4.33	99	Mali	3.17
36	Czech Republic	4.33	100	Tanzania	3.17
37	Hungary	4.28	101	Gambia, The	3.17
38	Barbados	4.26	102	Guyana	3.16
39	Puerto Rico	4.25	103	Burkina Faso	3.12
40	Thailand	4.25	104	Madagascar	3.12
41	Cyprus	4.23	105	Libya	3.10
42	Italy	4.21	106	Armenia	3.10
43	Slovak Republic	4.17	107	Ecuador	3.09
44	Latvia	4.14	108	Albania	3.06
45	Bahrain	4.13	109	Uganda	3.06
46	Jamaica	4.09	110	Syria	3.06
47	Jordan	4.08	111	Bolivia	3.05
48	Saudi Arabia	4.07	112	Zambia	3.02
49	Croatia	4.06	113	Benin	3.01
50	India	4.06	114	Kyrgyz Republic	2.99
51	South Africa	4.05	115	Cambodia	2.96
52	Kuwait	4.01	116	Nicaragua	2.95
53	Oman	3.97	117	Suriname	2.91
54	Mauritius	3.96	118	Cameroon	2.89
55	Turkey	3.96	119	Nepal	2.88
56	Greece	3.94	120	Paraguay	2.87
57	China	3.90	121	Mozambique	2.82
58	Mexico	3.90	122	Lesotho	2.79
59	Brazil	3.87	123	Ethiopia	2.77
60	Costa Rica	3.87	124	Bangladesh	2.65
61	Romania	3.86	125	Zimbabwe	2.50
62	Poland	3.81	126	Burundi	2.46
63	Egypt	3.74	127	Chad	2.40
64	Panama	3.74			

(Cont'd.)