

Executive Summary

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The *Global Information Technology Report 2004–2005* makes its appearance at a critical juncture in the recent evolution of the world economy. There is growing evidence that global economic activity may have entered a phase of sustained expansion, with a strong recovery across most markets. This has led to heightened optimism about the near-term outlook, tempered by lingering concerns about the long-term impact of global macroeconomic imbalances, volatility in the oil markets, and an unsettled security situation in the Middle East. The bullish sentiments prevailing in the markets in the late 1990s and the early part of the present decade, which fed the bubble in technology stocks, have largely given way to a more sober mood among investors and a more realistic assessment of the role of information and communication technologies (ICT) in the development process, both in developed markets and among emerging economies.

It is against this background of cautious optimism about global economic prospects, borne of some painful lessons learned in the recent past, that this Report is being published. It builds on the work done in three previous editions and thus may be seen as part of a long-term commitment at both the World Economic Forum and INSEAD to the dissemination of business-relevant research on information technology issues with a strong practical focus.

The Report is divided into three parts. Part 1 contains a series of essays written by knowledgeable practitioners, scholars and experts with an enviable body of relevant experience in the ICT area. Ranging in coverage from an update of the by now well-established Networked Readiness Index rankings, to an examination of the role of the Internet in the provision of government services, to the challenges posed by rapid technological change for the formulation of credible regulatory frameworks, these studies—briefly summarized below—provide fresh insights into some of the most topical issues affecting the ICT industry. The country profiles presented in Part 2 provide valuable background information on the components of each country’s networked readiness rankings. As such, they are a useful synthesis—allowing the benefit of international comparisons—of the work underlying the index rankings. The data tables in Part 3 provide additional rankings for all the variables used in the Report.

The Networked Readiness Index

The chapter “An Analysis of the Diffusion and Usage of Information and Communications Technologies of Nations” by Soumitra Dutta and Amit Jain (both at INSEAD) presents the results of research evaluating the relative level of ICT development in 104 nations across the world. Based on empirical analysis of data collected from leading internationally recognized sources such as the World Bank, the International Telecommunications

Union, Pyramid, and the World Economic Forum's Executive Opinion Survey, the level of ICT development of nations is assessed via the estimation of a Networked Readiness Index (NRI). As in previous editions of the *Global Information Technology Report*, the framework developed to estimate networked readiness rests on three fundamental pillars. The first pillar captures aspects of the environment of a given nation for ICT development, such as the regulatory regime and the legal framework for ICT, the available infrastructure, and other factors capturing elements of the market for technological development. The second pillar looks at actual levels of networked readiness of the three main stakeholders in the economy: individuals, businesses, and governments. Finally, the actual levels of usage of ICT by these three groups are also brought in as a third pillar.

The NRI rankings for 2004 are broadly consistent with those published in the 2003–2004 Report. Eight of the top 10 countries listed in that Report still occupy top-ten positions in 2004–2005. Singapore emerges as the global leader on the Networked Readiness Index rankings, with the United States (in first place in 2003–2004) now moving to fifth position and Hong Kong and Japan moving into top-ten ranks. The Nordic countries continue to occupy privileged positions, as in the past. Among the larger emerging markets China and India both moved up the ranks, to 41st and 39th place respectively, significant improvements on 2003–2004. In Latin America, Brazil and Mexico registered drops in rankings, while Chile continues to lead the region by a significant margin.

Dutta and Jain also explore the relationship between the Networked Readiness Index and one of the indices of competitiveness estimated by the World Economic Forum. The link between investment in ICT and a nation's productivity has long been a subject of significant interest for decision makers and economists. The analysis carried out by the authors establishes a strong link between the two, with the three stages of a nation's development identified by the Forum's competitiveness research corresponding to three distinct groups of Networked Readiness scores.

The Emergence of e-Government

Many public sector organizations are trying to broaden delivery of citizen services while improving efficiency. In their chapter "Net Impact: European e-Government" Douglas Frosst, Scott Brown and Andrew Elder from Cisco Systems look at the interactions between people, process and technology in efforts under way to improve productivity in the European public sector. These efforts are part of various initiatives in Europe aimed at strengthening the role of ICT in society. Many of these reflect government programs, such as the European

Commission's e-Europe 2005 Action Plan and Connected Health initiatives. They are part of a broader attempt on the part of EU members to move forward with broad-ranging economic and structural reforms in the context of the so-called Lisbon Strategy, a key component of which seeks to boost aspects of the information society across Europe at the levels of households, businesses and government services. Achieving these goals will require investments in people, process and technology appropriate to the objectives and abilities of the organizations involved.

To help identify the correlation between the aims pursued by these projects and the desired outcomes, Cisco Systems sponsored Net Impact 2004: Europe e-Government, a research project attempting to better understand the impact of Internet technologies on organizations. Under the project's auspices more than 1,400 ICT and business decision makers from government and healthcare organizations in France, Germany, Italy, the Netherlands, Poland, Spain, Sweden and the United Kingdom were interviewed to assess the state of networking infrastructure, business processes, applications, and other organizational behaviors.

Many studies of productivity use a single macro-level measurement to determine productivity gains. Since each organization faces different environmental conditions and objectives, these high-level measures have limited usefulness. Net Impact 2004 identified best practices that led to positive outcomes for business efficiency, service effectiveness, financial optimization and citizen satisfaction. Specific areas of improvement are described within each of these four themes.

Net Impact 2004 concluded that "Connected Organizations" that increased their productivity the most had higher levels of process automation and integration distributed to employees and other key constituents with a sophisticated network. These groups employed formal measurement systems to monitor improvements and provide the necessary feedback. They also encouraged an organizational culture of open communication about these initiatives and a positive focus on process improvement and end-user services. The study by Frosst, Brown and Elder is thus a particularly welcome contribution to a better understanding of the impact on productivity of efforts aimed at boosting the role of Internet technologies in the provision of more efficient services to consumers of government services, such as in the area of healthcare. The Lisbon Strategy seeks to make the European Union (EU) "the most competitive and dynamic knowledge-based economy in the world" by 2010. This study is a fine example of what it will take to achieve the goals of Lisbon pertaining to its information society component.

The Economic Gains of ICT

In a chapter titled “The ICT Sector and the Global Economy: Counting the Gains,” Markus Haacker argues that technological advances in information and communication technology over recent decades have transformed the way businesses are operating, and have resulted in changes in the patterns of global trade in goods and services. The prospects for sustained economic growth fuelled by the “new economy” have attracted much attention, although the crash in IT equity prices in 2000 brought home the realization that the economic “laws” of competition (and creative destruction) apply as fully to the ICT sector as to the rest of the economy. Rather than adding to the existing literature on the ongoing ICT-driven transformation of the global economy, Haacker takes a “low-tech” approach focusing on the production and use of ICT equipment. In particular, he argues that, as the use of ICT requires the use of some equipment, data on sales of the latter provide valuable information on the role of ICT across countries, in particular for lower-income countries where detailed national account data on ICT-producing or ICT-using sectors are not available.

Haacker finds that, while productivity gains in the production of ICT goods have been impressive, most of the gains dissipate as these ICT goods are exported. While one would expect that high-income countries, with a larger share of services and more technologically advanced economies, are the primary beneficiaries of productivity gains in the IT sector, the author finds that this is not necessarily the case. While usage of IT products is positively correlated with GDP per capita for higher-income countries, this relationship breaks down for countries with an annual GDP per capita of less than \$5,000. Some of the countries posting the highest gains are in this lower-income category, and his findings suggest that trade barriers (or the lack thereof) are an important determinant of usage of ICT goods in lower-income countries.

Regulating the ICT Industry

In their chapter “Is a New Regulatory Framework for Telecommunications Needed for the Twenty-first Century?” McKinsey’s Scott Beardsley, Luis Enriquez, Victoria Gerus and Andreas Marschner argue that the liberalization of telecommunication markets during the past two decades has brought substantial benefits to consumers and businesses. In opening previously reserved services to competition, regulators encouraged efficiency improvements in incumbent fixed-line businesses and transferred industry value to consumers through dramatic price reductions and, along the way, sparked significant service innovation. Thus, quite deliberately, the traditional regulatory framework focused on promoting price

competition in formerly monopolistic markets in fixed telephony and data. This approach was not designed, however, to address the recent competitive and technological developments in the industry. These developments, such as fixed-mobile substitution, competition in fixed access, the growth of broadband access and the resulting take-up of voice over Internet Protocol (VoIP) are fundamentally changing the structure of the industry.

The existing “regulatory tool-kit” appears increasingly unsuited to address these types of competitive dynamics. As a result, the application of the classic regulatory approach, the authors argue, is now distorting economic incentives for market players, and thus is putting at risk long-term customer benefits from technological improvements and infrastructure investments. The adequacy of this model to support the industry’s future is called into question by the authors, who make a case that a radical reassessment is needed in light of the industry’s fundamental economic characteristics and several recent developments, such as its capital-intensive infrastructure, the importance of long-term innovation and the critical effect of scale and network effects on its competitive dynamics, all of which features it shares with many other network industries.

This chapter makes the case for a change in approach and puts forth several thoughts on the direction in which the traditional regulatory framework could be adapted for the next “growth horizon” in the industry. It reminds the reader of the rationale of the traditional regulatory framework and points out its strengths and weaknesses. The authors’ approach is broad-based, bringing in, where necessary, useful examples from different countries, contrasting interesting differences in regulatory environments and highlighting the international nature of the problem they have set out to analyse. They then argue that a required return on investment approach to the industry and ongoing processes of technological progress and transformation call for a different line of attack. The chapter’s final section explores the implications of these trends and changes for the future of telecommunication regulation. Many of these implications may also be relevant to other sectors in the ICT field that exhibit similar economic characteristics.

The Role of Government Policy

Government policies can have a huge impact, both positive and negative, on how quickly the information society and the infrastructure that supports it develop. While this is no doubt true everywhere, it is particularly so for the developed markets, given the greater penetration of Internet technologies and, at least in the case of the EU, the explicit incorporation of “information society”

elements in the formulation of economic and structural reforms, such as in the context of the Lisbon Strategy referred to above. The Internet Society has long stressed the need for governments to address a wide range of challenges, including promoting competition, supporting investment in telecommunications, encouraging Internet deployment and use, reducing the cost of ICT equipment and software, increasing the availability of affordable content, and investing in training and education. The chapter “Building a Sound Foundation for the Information Society” by Elliot E. Maxwell and Michael R. Nelson focuses on one key aspect: the policies that governments should adopt to promote the creation and deployment of advanced telecommunication infrastructures and the applications and content that are made available over them.

Too often have government policies, based on older technologies and assumptions about telecommunications, prevented competition, slowed its growth, or tried to manage it in some fashion. The effect has been to reduce investment and delay the availability of new technologies and services. Maxwell and Nelson use the 1996 Telecommunications Act in the United States as a case study of the need to fully update policy paradigms in order to take advantage of technologies such as cable television, licensed and unlicensed wireless, power lines and satellites to stimulate competition, increase investment, better regulate market power, and make new services, applications, and content available to all.

Rather than continue with regulations that reflect their origins in a world of monopoly telecommunication providers and that treat various distribution technologies differently in a “vertical” or “stove-pipe” fashion, the authors advocate a new “horizontal” model which better reflects the increasing digitization of information, the convergence of technology platforms and services, and the Internet’s architecture. It sets forth minimal regulatory requirements for Internet-like “openness”, including interconnection of networks, broadband transport available to all on a non-discriminatory basis without government-determined pricing, and rules against “unreasonable” discrimination against applications and content.

These limited requirements reflect the fundamental change resulting from broadband deployment, which is to separate the provision of services from the provision of applications. This new model of regulation would create, in the authors’ view, an environment that fosters competition in all the layers (including transport, applications and content), reduce the need for detailed economic regulation, better control market power, and encourage entry and investment by any player using any distribution technology. The chapter also suggests mechanisms to support the availability of advanced services

for the under-served, an elimination of regulations as competition increases, greater flexibility in meeting “provider of last resort requirements” and encouragement of an “open” spectrum policy to facilitate the development of “inter-platform” competition from licensed and unlicensed wireless broadband providers.

Outsourcing Opportunities and Challenges

Outsourcing is now an established fixture in the organizational models of the twenty-first century. At first confined to peripheral business activities such as cleaning, transport, or legal services, outsourcing now encompasses business functions that are closer to the “core”, such as manufacturing, customer management, or information technology. As an area of economic activity, outsourcing has become a multibillion dollar industry, and there is every expectation not only that it is here to stay but that it will expand quickly in coming years. Driven by a rapid and sustained reduction in the costs of cross-border communication, outsourcing will affect in quite tangible ways the business environment of the corporation. The chapter “Next Generation IT Outsourcing: Profits or Perils?” by Mark Melford, Miles Wright and Suvojoy Sengupta of Booz Allen Hamilton is thus a welcome and timely contribution to this volume.

Outsourcing offers strategic and economic benefits that are too compelling to ignore. When it works, the authors point out, outsourcing decreases costs, increases flexibility, enhances expertise, boosts discipline, and provides the freedom to focus on core business capabilities. However, the worlds of business and government are replete with examples of outsourcing decisions gone wrong. And, as suppliers become more tightly integrated into the fabric of a company’s basic business operations, the risks attending the failure of these relationships escalate.

IT outsourcing is at the sharp end of this movement. Many companies’ IT activities are so close to “core”—that is, so closely intertwined with basic business processes—that an IT outsourcing decision becomes a strategic choice. IT outsourcing is now a developed market where global suppliers are offering differentiated and more flexible service propositions, resulting in increased complexity of the procurement process and relationship models.

Outsourcing in general and IT outsourcing in particular are thus increasingly not just make-or-buy decisions; they are make-or-break decisions. This chapter is aimed at executives facing an imminent or potential IT outsourcing decision. It addresses the following key questions:

- What is the track record of outsourcing so far and what lessons can be learned from it?

- What are the common pitfalls and how can they be avoided?
- How to do it right: key success factors in making your IT outsourcing decision.

Working with clients across a range of industries, the authors identify five common myths about good outsourcing practice, perceptions which can lead to failure of the outsourcing deal. Tapping into a rich trove of experience at Booz Allen Hamilton, they also observe the common characteristics of successful outsourcing decisions, and crystalize six steps which successful companies tend to follow as they identify what should and should not be outsourced and manage new supply relationships. This chapter is, therefore, a highly practical, hands-on primer for managers and decision makers for whom outsourcing, and the choices that stem from its increasingly ubiquitous character in the global economy, are likely to matter a great deal in coming years.

Taiwan and the Emergence of an ICT Giant

For several decades now Taiwan has been one of the fastest-growing economies in the world—a senior member of the “Asian tigers” club, with an impressive track record of sustained increases in per capita income, reflecting the gradual transformation of the economy into a powerhouse of high-technology manufacturing. Indeed, during the past 20 years Taiwan has emerged as a leading producer of information and communication technology products. From motherboards to LCD monitors, from personal computers to wireless local area networks, Taiwanese companies produce a very substantial share of the devices that now find their way into workplaces and homes all over the world. Indeed, technology-intensive industries, mostly in ICT, now make up over half of Taiwan’s economy, compared with less than a quarter in the late 1980s. Taiwanese manufacturers collectively produce well over half the global supply of the devices that make up the core of the worldwide ICT industry and infrastructure.

While this would not surprise were it to apply to the United States or some other suitably large economy, it is an extraordinary fact, worth examining, that a small island of some 22 million inhabitants should have attained the status of main ICT supplier to the global marketplace. This edition of the *Global Information Technology Report* presents a case study on the development of the ICT industry in Taiwan. What have been the factors that have propelled it? What has been the role of government policy in nurturing the development of ICT, particularly in the areas of higher education and manpower development, innovation and R&D, and the setting of non-distortionary incentives mechanisms? How has the industry managed to maintain its competitive edge in the

face of growing competition from other producers? What are its long-term prospects against the background of swift changes in the industry brought about by technological change and the natural desire by other countries to want to gain a foothold in the industry? Are there lessons from Taiwan’s experience with ICT that have relevance for other countries in search of a niche in the global economy, either in some specialty area of ICT itself or in some other area of particular comparative advantage? The study by F. C. Lin analyses these issues in a way that is at once concise and informative, providing fascinating insights into what is surely one of the more compelling development stories of the past half-century.