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How nations thrive in the Information Age

Leveraging information and communications technologies for national economic development

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E-readiness

We are grateful to the Economist Intelligence Unit for allowing us to use data presented in their E-readiness Rankings series of studies (published between 2001 and 2006) in our analysis of trends. The findings and views expressed here do not necessarily reflect those of the Economist Intelligence Unit. Neither the Economist Intelligence Unit, nor its affiliates, can accept any responsibility or liability for reliance by any person on this information.

How nations thrive in the Information Age

Leveraging information and communications technologies for national economic development

By James W. Cortada, Ashish M. Gupta and Marc Le Noir

Around the world, the use of information and communication technologies (ICT) continues to rise sharply. Whether countries today are part of the most advanced "Established Leaders" group, the heterogeneous middle tier we call "Rapid Adopters" or the group of "Late Entrants" where ICT is least influential on their economies, each nation must aim for greater E-readiness – and fast. Here, we provide an overview of the current economic landscape, as well as how each group of countries can learn from the practices of the more advanced ones and prepare themselves to compete better on a global stage.

All nations in developing and advanced economies have become such extensive users of information and communications technologies (ICT) that their economic success now depends on governments' wise promotion and deployment of ICT at a national level. Most governments are committed to using these technologies to enhance their nations' competitiveness in the global economy and to improve the internal operations of public agencies.

However, just as ICT can offer nations potential opportunities to improve the economic and social quality of citizens' lives, challenges to national success also exist. Effective implementation of national economic development policies that integrate economic, social and technological strategies are essential to compete effectively in the globalized economy of the twenty-first century.

There is growing urgency for policy makers to incorporate ICT into economic policies because of expanding international competition for such resources as skilled labor, investment funds and trade. ICT has clearly become an important part of national strategy, largely due to remarkable improvements in various technologies over the past two decades.

Also, just in the past few years, there has been a significant up-tick in the adoption of such tools as the Internet, wireless communications, as well as "computing" that is embedded in all manner of goods and services. One example of embedded computing is a leading tire manufacturer that is considering ways to embed microchips in its products to allow future interaction with smart devices built into roads and other transport infrastructure.[1]

Studies conducted over the past half-decade by the Economist Intelligence Unit (EIU), in collaboration with the IBM Institute for Business Value, have led to the *E-readiness Rankings*.[2] These annual rankings have clearly documented a major shift in economic activities, with the growing use of ICT as the most obvious trend. Equally important, national strategies and leading practices are emerging that can be leveraged by all nations that wish to remain competitive.

The E-readiness Rankings

The EIU has published an annual E-readiness ranking of the world's largest economies since 2000. *E-readiness* is defined as an indication of how amenable a national market is to Internet-based opportunities. The ranking evaluates the technological, economic, political and social assets of 68 countries and their cumulative impact on respective information economies. The rankings are based upon nearly 100 quantitative and qualitative criteria, organized in six distinct categories: Connectivity and Technology Infrastructure, Business Environment, Consumer and Business Adoption, Legal and Policy Environment, Social and Cultural Environment, and Supporting e-services.

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Enablers of ICT development

National economies have been evolving along a set of economic, political and social dimensions that interact with each other. Along with these traditional areas of influences on a nation's economic development, ICT has become a major element.

The first competitive element of a national economy is its business environment. The expected attractiveness of general business conditions plays an important role in attracting investment funds, for example. Healthy economies have industries that frequently are "high technology" (high-tech), such as the software industry in India and the many ICT firms in Eastern China. Often, such industries lead to substantial economic growth in a national economy. However, neither India nor China yet ranks highly in terms of the quality of its business environment, compared to a majority of the nations on the E-readiness rankings.

A country's overall legal framework and specific laws for protecting property rights also affect the ability of an economy to compete. This entails more than simply protecting the rights of people and companies to enjoy the benefits of buildings, merchandise and patents. Nations also need to protect the rights associated with software, content and copyrightable materials.

More recently, governments have additionally had to establish protections and policies that promote Internet use. The majority of governments have concluded that Internet use is crucial to economic and social welfare. The U.S. government invested billions of dollars to provide Internet access to every classroom in the country. Across various European countries, the cost of Internet access was lowered. In Korea, the government promoted the extensive use of broadband connections and now Koreans are the most "wired" citizens in the world.

The EIU studies, and those of other organizations like the Organisation for Economic Co-operation and Development (OECD) and the United Nations (UN), clearly show that both consumer and business adoption of all manner of ICT has been steadily increasing over the past fifteen years.[3] Along with rising availability and affordability of ICT, the quality and reliability of ICT has improved dramatically, particularly for communications around the world. For example, e-business activity rose from being non-existent to form nearly 10 percent of all sales in the U.S.[4]

As the amount of ICT business activity has increased in an economy, so too has the presence of intermediaries and ancillary services, such as IT consulting service, the deployment of new back-office processes and outsourcing of data processing. Frequently, these are evident in banking, call centers and insurance transactions, and by the development of such high-tech items as software and computer components.

Findings of EIU and other studies over the past decade also point out the importance of having a social and cultural environment conducive to modern economic growth.

Specifically, the most advanced competitive economies reflect common characteristics, such as high education levels, nearly 100 percent literacy rates and extensive Internet experience for large percentages of the population. These should be considered as pre-conditions for the continued successful improvement of a modern economy.

In addition, the encouragement of an entrepreneurial attitude through supportive national policies is having a profound effect on nations. This is happening today in India, China, and large swaths of Central and Eastern Europe. Ease in registering new businesses, making capital available to them and implementing supportive tax policies and incentives are examples of such initiatives. These and similar government practices, regulations and laws allow government officials to directly support their local economies.

For more than five years, the countries surveyed as part of the annual rankings have dramatically improved their E-readiness, with the middle tier of Rapid Adopters making the greatest progress during this period.

Key E-readiness trends

Analyses of the results of the EIU's annual *E-readiness Rankings*, published from 2001 through 2006, demonstrate a number of patterns of practices around the world. The world's largest economies can be categorized into three tiers, based on the extent of ICT deployment. Countries within a specific tier seem to share similar sets of political, economic, social and technological attributes, and can be broadly categorized into three tiers:

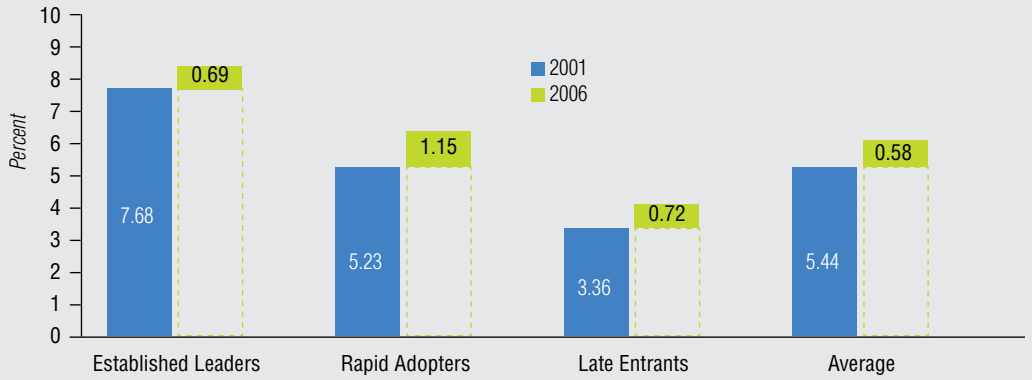
- *Established Leaders* (or Tier 1 countries) – The most extensive and mature users of ICT
- *Rapid Adopters* (or Tier 2 countries) – Countries which have made rapid progress in ICT development in recent years and are beginning to challenge the most advanced economies or the Established Leaders
- *Late Entrants* (or Tier 3 countries) – Countries that started the new century with inadequately developed social, economic, political and legal infrastructures, and where ICT influences a very small part of their economies.

Over the past half-dozen years alone, the overall E-readiness performance of all countries has improved significantly, although the pace of development varied across the three tiers. The most extensive and mature ICT users, Established Leaders, improved their E-readiness by 9 percent just in the past six years. Rapid Adopters improved their use of technology and creation of the necessary infrastructure (such as improving education) by 22 percent, thereby beginning to challenge the leaders in the pace of ICT enablement. Late Entrants – laggards in the use of ICT for national economic development – have also committed to transforming their societies, with rates of development now mimicking those of Rapid Adopters.

In short, over the past half-decade, the over 60 countries surveyed had dramatically increased their E-readiness and thus their ability to compete on a global basis with both the necessary ICT and social/legal infrastructures. Rapid Adopters have made the greatest progress, while Late Entrants have experienced difficulty in embracing the practices of countries above them (see Figure 1).

Countries have moved around and occupied different spots in the annual E-readiness surveys during 2001-2006. A look at the average ranking for the period highlights the true E-readiness leaders in each tier for the period (see Figure 2).

FIGURE 1.
Average increase in E-readiness score over 2001-2006.



Note: Average overall increase for all the countries between 2001 (60 countries) and 2006 (68 countries) is relatively lower (at 0.58) than the increases for individual tiers (at 0.69 for Established Leaders, 1.15 for Rapid Adopters and 0.72 for Late Entrants, respectively). This lower overall increase is because a majority of new countries added to the rankings during this period had lower absolute E-readiness scores..
Source: Annual E-readiness Rankings 2001-2006, EIU.

FIGURE 2.
Top 5 ranking countries, based on average ranking during 2001-2006.

Rank	Established Leaders	Rapid Adopters	Late Entrants
1	Denmark	Italy	Bulgaria
2	United States	Spain	Turkey
3	Sweden	Japan	Thailand
4	Switzerland	Portugal	Venezuela
5	United Kingdom	Israel	Romania

Source: Annual E-readiness Rankings 2001-2006, EIU.

The most advanced economies, Established Leaders, now face having to replace older ICT infrastructures, finding better ways of using ICT and addressing unique challenges associated with aging populations.

Established Leaders: Profile and key trends

This group is made up of the top 20 countries in our rankings and it includes many nations from Western Europe, North America and Asia-Pacific (see Appendix for the list of countries in each tier). Politically, they generally have representative governments, are pro-competition, and are open to foreign investments and ownership. They also have flexible labor laws and extensively developed labor markets. Governments have evolved highly advanced e-government strategies.

Economically, per capita gross domestic product (GDP) tends to be high, in the range of US$30,000 to US$50,000 for most countries. In these countries, new businesses can be registered very quickly, usually in 18 to 20 days. Businesses' expenses for complying with government regulations are the lowest of the three tiers, and few legal impediments exist for their growth inside the nation and overseas. There are also multiple funding sources available for new start-up businesses. These successes and advantages of the Established Leaders are relative to the performance of all other nations, yet even they have much room for improvement.

Socially, they have very low population growth combined with high life expectancy rates. On average, citizens in these countries have 10 or more years of formal education and rank in the top 20 in the United Nations' Human Development (HDI) Index.[5]

Technologically, Internet literacy is quite high by global standards, with 50 to 60 percent of the population using this technology and 80 to 90 percent using mobile telephones. Citizens spend the most on ICT per capita, in the range of US$2000 to US$2500. They are also switching rapidly to broadband and wireless uses of ICT. There is a strong e-services market and their governments play leading roles in defining Internet laws and intellectual property management.

Measured by E-readiness scores, these countries have remained very similar for a number of years, reflecting the use of mature technologies. Many of their social, legal and political infrastructures are well advanced. These countries have taken the lead in changing their legal and policy environments relating to ICT use – most specifically, the Internet – while their business environments have remained generally stable and prosperous, supported by sound government policies.

The middle tier of nations, Rapid Adopters, is currently dominated by Central and East European countries. They generally enjoy strong economic growth, but lag the Tier 1 countries in personal and business use of ICT.

Rapid Adopters: Profile and key trends

The middle tier of Rapid Adopter countries consists of two types: those who fell behind their more developed peers due to a slow pace of economic reform; and nations that otherwise would have been designated as Late Entrant economies if they had not accelerated growth through fast-paced market reforms (see Appendix for the list of countries in each tier).

The political environments of most Rapid Adopter countries tend to have slightly higher levels of market regulations as compared to the Established Leaders, but are being liberalized at a very fast pace across many industries. Their labor markets are reasonably developed and have been shifting recently toward more flexible forms that make it easier for firms to add and change personnel, and to use temporary workers. Governments have begun to develop Internet-based services and communications with their citizens and are working on bringing their laws regarding the Internet and intellectual property management in line with those of leading nations.

The economic environment of these countries is rapidly improving, with per capita GDP for most countries in the range of US$13,000 to US$18,000 (in contrast with a range of US$9,000 to US$14,000 for most countries in 1999). Procedures for registering new businesses take longer as compared to Established Leaders, ranging from 30 to 35 days on average, reflecting a slightly higher degree of bureaucracy and regulatory burdens. Regulatory impediments also exist for firms that want to downsize or expand. Most of these focus largely on rules regarding worker hiring and dismissal.

Social environments in these nations differ from Established Leaders in several key ways. For the most part, they experience very low population growth rates – in some cases, the growth rate is even negative. The amount of education per capita is generally lower, averaging 6 to 7 years and these nations rank lower in the UN's HDI rankings.[6]

Their technological environments reflect lower levels of Internet use, between 15 to 20 percent of the population, yet reliance on mobile phones remains high (60 to 70 percent). Personal spending on ICT is below that of Established Leaders, but higher than the Late Entrants, in the range of US$500 to US$800 per capita, with 70 percent on mobile phones.

Yet, Rapid Adopters are experiencing sustained growth in the number of e-service firms and industries, reflecting the quickly expanding demand for ICT goods and services in most countries. Governments in these nations, however, lag their more advanced peers in adopting Internet laws and managing intellectual property rights.

Of the three groups, Rapid Adopters experienced the greatest amount of change over the past half-dozen years. Today, Central and East European countries dominate this group as they move aggressively to modernize their economies as part of joining the European Union and in support of national initiatives to become competitive in the global economy. Supporting e-services in the private and public sectors has been a major initiative.

Over the period, they improved substantively in the development of legal, policy, social and cultural environments necessary to operate an advanced economy. They generally enjoy strong economic growth but lag the most advanced nations in the personal and business uses of ICT, despite recent rapid rates of adoption of computing and telecommunications (particularly mobile phones) – a process that is continuing, even though it is now decelerating in some countries as deployment becomes saturated.

Late Entrants: Profile and key trends

Most countries in this third tier are handicapped by poor social infrastructures reflecting such problems as low educational attainment and extensive income variation, all of which are hampering uniform ICT deployment and use across national populations (see Appendix for the list of countries in each tier).

The political environment is often friendly to competition, with foreign participation allowed in certain sectors. Labor markets are less developed and there is growing recognition of the need to introduce more flexible employment contracting regulations. Most Late Entrant nations are in the early stages of developing and coordinating plans for building technology-equipped societies. Many, however, are also struggling with how to implement laws covering the Internet and have poorly managed intellectual property laws.

These countries function in weak macroeconomic environments, with per capita GDP, for example, ranging from US$3000 to US$8000 for most countries. Procedures for registering new businesses are very long, averaging 55 to 60 days, indicative of the slow response of government agencies in facilitating development of entrepreneurial behavior in their societies. Sources of funding and capital availability for new start-ups remain scarce for private sector use.

The least advanced economies, the Late Entrants, face a different kind of demographic crisis: they have the youngest populations of the world, with the least amount of formal education and lowest standards of living.

Socially, these countries are experiencing relatively high population growth rates, with growing proportions of very young people. Average education amounts, however, at 3 to 4 years, are the lowest of all three tiers. A significant part of the Late Entrant population also lacks access to such basic living amenities as electricity and clean drinking water. Quality of health and healthcare are also quite low.

Technological environments lag those of the other tiers. For example, Internet literacy exists in only 2 to 5 percent of the population and use of mobile phones ranges at 20 to 30 percent. Not surprisingly, per capita expenditures on ICT are also low, ranging from US$100 to US$200, with 75 percent for telephone services. These nations devote more effort to developing digital telecommunications (telecom) infrastructures, which makes sense since communications is the backbone needed to support such ICT uses as broadband Internet use or even mobile phones. E-business and e-enabled services are more the exception than the rule, although some nations are striving to develop IT outsourcing capabilities. India, as a leader in this area, is using this kind of development in support of national economic evolution.

Over the past half-dozen years, Late Entrants have made significant improvements in developing more modern social, cultural, environmental and legal policies, but continue to experience low performance in such areas as encouraging consumer and business adoption of ICT, with performance scores actually dropping over time. In countries with very large populations like India and China, per capita ICT expenditures have been so inadequate that necessary infrastructures are limited. Only large and medium sized firms make noticeable use of ICT. While small enterprises may go as far as creating a Web site, little or no business is transacted online.

The road ahead

Each tier of countries is in various stages of transformation, some more dramatic than others. Established Leaders, with the most extensive ICT experience, need to continue innovating in their use of technology and public policies to remain competitive. The large collection of emerging rivals, Rapid Adopters, also have much work to do and are learning many useful lessons from the Established Leaders' prior experiences. Many Late Entrant countries are displaying an appetite to modernize their economies – they are also borrowing from other nations' experiences.

However, to be competitive, all nations will have to continue improving their E-readiness relative to each other. There are a number of strategies that each cluster of countries can tailor to its specific needs.

So what should Established Leaders do next?

As increasing ICT penetration ceases to be a competitive advantage, countries in the leading tier will need to raise the bar by increasing the efficiency and use of their current ICT infrastructure. Established Leader nations will want to take action on political, economic, social and technological issues as they increase their societies' ability to compete in a rapidly evolving global economy.

To stay on top, Established Leader countries will need to aim for ongoing improvements in the efficiency, capability and uses of their ICT infrastructures.

In fact, Rapid Adopters have started to challenge the economic and social effectiveness of Established Leaders as the second tier strives to achieve the same high standards of living the first tier has enjoyed over the past two decades. Thus, while the leaders encourage Rapid Adopters to upgrade their technological, political, social and economic infrastructures – as is happening with new entrants into the European Union, the World Trade Organization (WTO) and North American Free Trade Agreement (NAFTA) – global competition increases on many levels.

The political environment for Established Leaders, while quite strong, calls for several sets of initiatives. Governments should consider taking the following actions:

- Reduce or maintain product and labor market regulations at low levels to facilitate sustained economic growth
- Coordinate government e-strategy through a single point of entry for all government services online, a process already underway in North America, parts of Asia and Western Europe
- Promote development of the next generation of infrastructure in the delivery of services to the nation
- Continue implementing market reforms that reduce the costs of new technologies to facilitate access for people who are currently excluded due to high costs.

Economically, governments should focus on three essential strategies and policies:

- Increase cross-sector and cross-community linkages that enable sharing of leading practices and help increase overall ICT effectiveness within the national economy
- Make digital channels more convenient and more cost-effective for both governments and businesses, and to encourage higher adoption by consumers and citizens
- Strengthen governance for e-commerce and Internet security with local industries to promote online trade.

Switzerland

Switzerland has been the highest gainer on the E-readiness Rankings in the last six years, moving eight places to reach the 3rd spot in the 2006 rankings. Emphasis on next-generation infrastructure development, security and ICT investment have helped make Switzerland an ICT leader. The country's highly skilled workforce and sustained ICT spending have helped to boost service and product innovation from companies in the industry. Telecom operator Swisscom has been among the world's most aggressive developers of wireless WiFi networks and services in the country. The use of Internet for national ballot in Switzerland's September 2004 federal election – the world's first such example – shows the government's commitment to promoting ICT in the economy.

Source: The Annual E-readiness Rankings 2005 and 2006, EIU.

Socially, much good work has been done by Established Leaders, particularly regarding education, but enhancements are needed to avoid being overtaken by Rapid Adopters that are increasingly engaging effectively in the war for talent.[7] Specifically, governments can leverage solid experience in this area, for example:

- Improve the quality of secondary and tertiary education, and concentrate on reducing school drop-out rates
- Improve access to education and job opportunities by those sectors of any currently deprived population, whether due to ethnic background or geographical constraints
- Integrate and continue to automate systems that exchange and share demographic data across government agencies as they strive for "one-stop" service to their citizens.

Despite enormous investments in technological infrastructure over the past half-century, it no longer is sufficient for governments to commit strongly to a vision of an Information Age society and governmental services. Established Leaders must upgrade aging ICT infrastructures to compete with the newest ones being created by the Rapid Adopters and Late Entrants that are not burdened with massive investments in older ICT. Essential improvements include:

- Develop and execute clearly articulated modern digital strategies and measure results against targets, such as the percent invested in specific types of ICT (for example, measuring broadband usage by citizens or government)
- Coordinate in a formal manner government-industry programs to enable efficient rollout of new technologies and their uses
- Develop efficient technologies for commercialization and implement transfer rules to speed their diffusion into the local society and global market.

New Zealand

New Zealand (NZ) has been one of the highest gainers in the E-readiness Rankings in the last six years. NZ gained six places to reach the 14th spot in 2006. It has been a leader among OECD countries in implementing far-reaching liberalization in most sectors. This has contributed to its phenomenal economic growth and strong ICT development. To maintain its position as an Established Leader, NZ will need to address several issues.

First, the uptake of household broadband access in NZ remains low compared to other OECD countries, although NZ was one of the first OECD countries to offer commercial broadband services in 1996.

Second, product and labor market regulation need to be maintained at lower levels to support industry competitiveness and labor market flexibility, as these are factors known to aid faster diffusion of ICT in an economy.

Third, as pointed out by experts in the area, NZ needs to address persistent educational underachievement of certain ethnic minorities through the expansion of early childhood education and development of well-coordinated and effective early intervention programs.

Source: Organisation for Economic Co-operation and Development (OECD); Economic Policy Reforms (2005) – New Zealand Country Notes; Annual E-readiness Rankings 2001-2006, EIU.

Along with improving education and increasing ICT capability and accessibility, Rapid Adopter nations will need to implement reforms in their product and labor markets.

So what should Rapid Adopters do next?

The challenge for Rapid Adopter countries is to reform their product and labor markets fast enough to compete against the leaders that have far more attractive business environments for new and existing firms. Second, Rapid Adopters are experiencing sharp increases in the demands of consumers and businesses to enhance existing ICT infrastructures. In many nations, these are aging or unable to handle greater volume of data, such as old dial-up telephone networks in parts of Europe not able to carry video streaming. These countries need speed of execution to make improvements within national borders and also in internal government operations.

To improve their political environments, governments should consider taking steps that can speed up the transformation of their economies along lines they have already deemed desirable:

- Establish a coherent and far-reaching government "e-strategy" that provides citizens with incentives to conduct government related transactions online
- Reform market regulations to enhance local competitiveness in the global economy, not just to improve competition within the nation
- Relax labor market legislation to make temporary and permanent employment contracting more flexible
- Put public services online, such as filing tax returns, renewing car licenses and registering new businesses
- Put government's own procurement processes online as well, to make access to governmental business national and competitive.

Today, much well-deserved attention is focused on economic development policies. Four fundamental strategies can enhance a government's ability to make its economy competitive on a global scale, specifically:

- Promote public/private approaches to the development and rollout of various ICT infrastructures, such as those for telecom, Internet, online services and Silicon Valley-like corridors, much as Ireland did in the 1980s and 1990s.[8]
- Provide more affordable and varied financing options to new start-up businesses to foster innovation in products and services brought to market
- Reduce the lead time and simplify procedures for new business registrations
- Consider nurturing emerging services sector industries, or even providing tax incentives to help firms put their businesses online.

Estonia

Estonia ranked highest among all the Central and Eastern European economies and occupied the 27th spot overall in the 2006 rankings. The country's progress is attributable not only to its good connectivity performance, but also to extremely proactive e-government development. The Estonian government showed, early on, the political will to create a digital society. Its efforts to bring IT to schools and villages, with programs in place since the early 1990s, are paying off.

All educational institutions have broadband connections and close to 80 percent of all banking transactions are electronic. In the span of a few years, the government has successfully liberalized and modernized the telecom landscape, welcoming Swedish and Finnish telecom operators. Initiatives such as its e-cabinet program, implemented in 2001 to streamline government decision-making at the highest level, have helped to improve administrative efficiency with a Web-based documentation system.
Source: The Annual E-readiness Rankings 2004, 2005 and 2006, EIU.

A key focus area for Rapid Adopters concerns education, where the opportunity to link their educational systems to the needs of the local labor market is crucial to national success. Specifically, these governments are finding it essential to:

- Enhance technical training, so workers can meet emerging market demands
- Increase access to and improve the quality of all levels of general education
- Keep improving the nation's transportation and housing infrastructure to facilitate the movement of workers to where jobs are located.

Finally, on the technology front, governments should give serious consideration to creating programs that give ICT access to citizens or enterprises in remote areas at affordable rates. Additionally, however, officials can leverage other capabilities of their governments to promote effective ICT use, more specifically by:

- Making it easier for firms to innovate and experiment by lowering regulatory burdens, thereby stimulating faster technology diffusion and deployment
- Improving the public's trust in online payment systems by using legislation to promote online trade. Key tactics can include using digital signatures and digital rights management – two approaches many nations still underutilize – to stimulate innovations in local trade practices.

So what should Late Entrants do next?

Often, the primary challenge for this set of countries is to enhance social infrastructures and increase aggregate incomes across society. In this way, a larger portion of Late Entrant economies can leverage ICT to improve their competitiveness in the global economy.

On the political front, the rankings data confirms what economists have been suggesting for some time. Governments should create legislation that promotes international trade and business-friendly economies, while eliminating corruption. Market regulations can be modified to promote competition and relax labor laws to make it easier for employers to hire temporary and permanent employees. Reducing the complexity, cost and time for new businesses to register offers a nation an opportunity to enhance local entrepreneurship, often seen as a major driver of economic prosperity.

For Late Entrant nations, boosting their E-readiness often hinges on enhancing social infrastructures and raising aggregate incomes – this can allow them to leverage ICT to raise global competitiveness.

Officials in Late Entrant nations will have much to do in improving their economy's prowess. In particular, five strategies can build nicely on the experiences of other nations:

- Develop efficient, secure logistics and transport infrastructures to facilitate quick, cost-effective movement of goods and people
- Solicit participation from industry in areas like electricity, healthcare and education
- Use innovative options like micro-financing to promote small-scale industry for self-employment of low-skilled workforces
- Develop agricultural support programs for the collection and dissemination of data on farmers' activities, weather patterns and commodity prices
- Reduce significantly the lead time and complexity of registering new businesses.

Social policies are also important for the future of these nations. Improving the quality and amount of education – at the primary, secondary and tertiary levels – should be one of a Late Entrant nation's highest priorities and remain so for the foreseeable future. Educators will need to weave computer literacy into their curriculums and training programs. They should also facilitate access to distance learning. Providing personal computers in public places in small and large communities also helps literate, low-income segments of society gain access to useful information.

For example, in Brazil a government-industry alliance set up Internet kiosks in shops that gave low-income Brazilians free access to online services. Similar community access programs could be delivered through access at schools or with the aid of public help groups.

Finally, on the technology front, lessons from early adopters of ICT suggest five clear actions Late Entrant governments can take:

- Play a larger role in creating and sustaining a national ICT infrastructure to enable improved communications and connectivity to the Internet
- Enable more affordable access to ICT by fostering competition, particularly among telecom providers
- Encourage use of ICT in the management of public finances, and in creating and disseminating social services information
- Work with businesses to develop appropriate technology standards to verify compatibility and increased seamless integration of network technologies
- Develop local ICT industries through favorable laws, tax incentives and exemptions to stimulate national GDP growth. The recent case of India should be seen as example of practical possibilities.

India

India's telecom liberalization kicked-off in 1997 when an independent regulator, Telecom Regulatory Authority of India (TRAI) was set up, and cellular and basic services were opened to private competition. The government has since liberalized continuously the telecom market and the limit on Foreign Direct Investment in the sector has been relaxed. Legislation promoting competition in the telecom market helped reduce telecom tariffs to among the lowest in the world currently and increased "teledensity" (defined as the number of telephone lines per 100 inhabitants) to about 14 percent, up from close to 2.5 percent at the start of the century.[9]

The government also provided several incentives to the ICT industry in India, including tax holidays and 100 percent FDI in the IT sector. Several Software Technology Parks (STP) are being setup in India by the Ministry of Communication and Information Technology with the objective of encouraging, promoting and boosting the software exports from India. Companies operating in these parks enjoy excellent connectivity infrastructure and subsidies on power and other infrastructure. The IT exports from STPs in India rose 36 percent to reach US$22 billion in 2005-2006.[10]

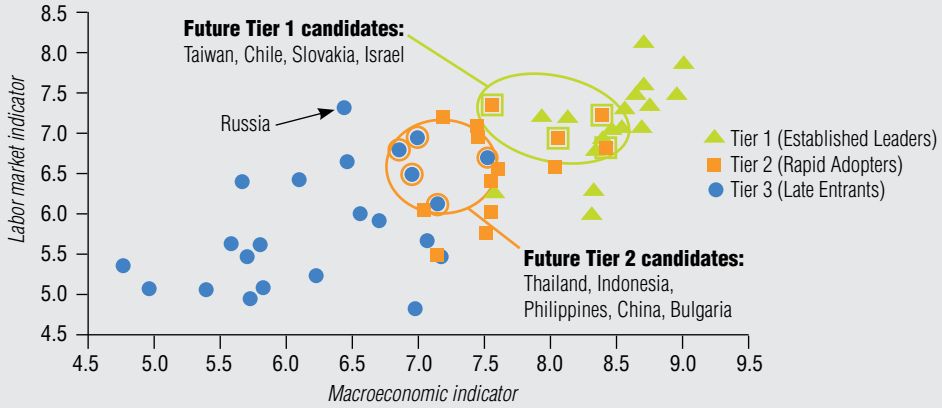
To whom the future belongs

What rankings of nearly seventy nations for many years suggest is that countries with the advantage of a strong macroeconomic environment and a buoyant labor market should expect to make bigger strides toward a strong E-readiness environment (see Figure 3).

Rapid Adopters are the fastest progressing economies and are thus prime candidates for significant improvements, providing they continue to invest in ICT on an ongoing basis. Potential candidates to make significant improvements and possibly even join the ranks of Established Leaders include Taiwan, Chile, Slovakia, Israel and Estonia (not included in Figure 3 due to non-availability of data). This suggests that opportunities for economic growth exist all over the world and not just in one region or tier.

For similar reasons, Late Entrants may evolve into Rapid Adopters. In this group, one can expect significant progress by Bulgaria, Thailand, Indonesia, Philippines, and, of course, China. Russia could also rise in the rankings, if it is able to enhance its macroeconomic environment.

FIGURE 3.
Future E-readiness leaders.



Note: A higher score on Macroeconomic indicator and Labor market indicator indicates a stronger macroeconomic environment and better developed labor market. 1 is the lowest score, 10 the highest.
Source: Annual E-readiness Rankings 2006, EIU.

Each country has unique ICT challenges, regardless of where it currently stands in the E-readiness rankings; each group has much to teach the others about different ways of making progress.

ICT telecom spending is expected to remain the primary area of investment for Late Entrant countries. Established Leaders and Rapid Adopters, however, are pushing ahead with the development of IT-based services in order to support an increasing number of e-government and private business transactions online and in a more competitive manner.

The way forward

As national economies have continued to become more integrated into one global economy – due to ever-improving transportation and communications infrastructure, and efficient financial and commercial structures – every government has committed to ICT investments of one form or another.

However, our findings suggest that progress should be made simultaneously on all the four fronts: political, economic, social and technological, not just along any one dimension.

So, what is an official to do to continue moving forward? We believe answering several key questions is a useful next step for officials in all nations, followed by taking action that is based on the answers.

1. To what extent is my economy easy to work in – from the perspective of a local firm, an international company or as an entrepreneur – when compared to those of other nations?
2. What reforms can I legislate and implement to make my economy competitive and leverage my national assets? For example, is it more important to improve education, transportation and telecom infrastructures, or the quality of citizens' health and the environment?
3. What improvements in our social policies would make my society a place that retains local, well-educated labor, attracts talent from other nations needed in our economy, and creates a healthy and prosperous society?
4. Recognizing that every nation is at different stages of economic and technological development, what kinds of ICT investments should our nation make?
5. How can government lead the way to model the effective use of all types of technology, not just computers and communication?
6. How can I measure my nation's progress in its overall improvements?[11]

These are a few powerful questions. Every nation will have different answers, but each also has problems to solve and changes to make. National and regional governments have a central, indeed crucial, role to play in leading their citizens and institutions through economic development.

Governments truly are moving quickly today to make improvements and their economies are also transforming rapidly. In short, there is an economic step change underway around the world, creating a sense of urgency for governments to exercise strong leadership. Each group of countries has much to teach others about how to make progress: first by identifying common characteristics, then by borrowing and sharing useful strategies.

In the case of ICT, rates of adoption of leading practices are increasing each year, requiring governments, leading companies and institutions to move expeditiously to keep up and excel. It is why IBM, the Economic Intelligence Unit, the United Nations, the European Union, and many international corporations are among the many organizations that are tracking and participating in this global process of transformation in public administration and economic innovation.

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Appendix

Countries in each tier and E-readiness Ranking.

Established Leaders		Rapid Adopters		Late Entrants	
Rank	***Country***	***Rank***	***Country***	***Rank***	***Country***
1	Denmark	21	Japan	41	Brazil
2	United States	22	Israel	42	Argentina
3	Switzerland	23	Taiwan	43	Jamaica
4	Sweden	24	Spain	44	Bulgaria
5	United Kingdom	25	Italy	45	Turkey
6	Netherlands	26	Portugal	46	Saudi Arabia
7	Finland	27	Estonia	47	Thailand
8	Australia	28	Slovenia	48	Venezuela
9	Canada	29	Greece	49	Peru
10	Hong Kong	30	UAE	50	Romania
11	Norway	31	Chile	51	Colombia
12	Germany	32	Czech Republic	52	Russia
13	Singapore	33	Hungary	53	India
14	New Zealand	34	Poland	54	Jordan
15	Austria	35	South Africa	55	Egypt
16	Ireland	36	Slovakia	56	Philippines
17	Belgium	37	Malaysia	57	China
18	Korea	38	Lithuania	58	Ecuador
19	France	39	Latvia	59	Sri Lanka
20	Bermuda	40	Mexico	60	Nigeria
				61	Ukraine
				62	Indonesia
				63	Algeria
				64	Kazakhstan
				65	Iran
				66	Vietnam
				67	Pakistan
				68	Azerbaijan

Source: The 2006 E-readiness Rankings, EIU.

References

[1] IBM Corporation. “Global Innovation Outlook 2.0”. http://www.ibm.com/gio

[2] Economist Intelligence Unit. “The 2006 E-readiness Rankings.” http://www.eiu.com/site_info.asp?info_name=eiu_2006_e_readiness_rankings

[3] Each year, the EIU publishes a global E-readiness Rankings. See, for example, Economist Intelligence Unit. “The 2006 e-readiness rankings.” http://www.eiu.com/site_info.asp?info_name=eiu_2006_e_readiness_rankings

[4] U.S. Census Bureau. “Statistical Abstract of the United States: 2006.” (Washington, D.C.: U.S. Government Printing Office, 2005).

[5] United Nations. “Human Development Report 2003 - Millennium Development Goals: A compact among nations to end human poverty.” http://hdr.undp.org/.

[6] Ibid.

[7] Recently described by Richard Florida. *The Flight of the Creative Class: The New Global Competition for Talent.* (New York: HarperBusiness, 2005.)

[8] Ray MacSharry and Padraic White. *The Making of the Celtic Tiger: The Inside Story of Ireland’s Boom Economy.* (Dublin: Mercier Press, 2000.)

[9] Telecom Regulatory Authority of India (TRAI).

[10] Software Technology Parks of India (STPI). www.stpi.in/news.htm. Accessed on January 9, 2007.

[11] Dijkstra, Sietze and Marc Le Noir. “The Big Lie About Transparency: How to Implement Performance Management in Government Successfully.” IBM Institute for Business Value. October 2004. http://www-03.ibm.com/industries/government/doc/content/resource/thought/1263011109.html

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