Economist Intelligence Unit

The Economist

E-readiness rankings 2009
The usage imperative

A report from the Economist Intelligence Unit

Written in co-operation with
The IBM Institute for Business Value

IBM

In this and previous e-readiness rankings, the Economist Intelligence Unit has worked in co-operation with the IBM Institute for Business Value. IBM provided feedback on the building and refinement of the rankings model and on the written analysis in the report. The Economist Intelligence Unit, however, is entirely responsible for the rankings and for the content of this white paper.

About the Economist Intelligence Unit

The Economist Intelligence Unit is the business information arm of The Economist Group, publisher of The Economist. Through our global network of about 650 analysts, we continuously assess and forecast political, economic and business conditions in 200 countries. As the world's leading provider of country intelligence, we help executives make better business decisions by providing timely, reliable and impartial analysis on worldwide market trends and business strategies.

Website: www.eiu.com

About the IBM Institute for Business Value

The IBM Institute for Business Value develops fact-based strategic insights for senior business executives around critical industry-specific and cross-industry issues. This paper is part of an ongoing commitment by IBM Global Business Services to provide forward-looking industry and business points of view, and to help companies and industries transform their futures. With consultants and professional staff in more than 160 countries globally, IBM Global Business Services is the world's largest consulting services organisation.

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About the 2009 e-readiness rankings

Since 2000, the Economist Intelligence Unit has assessed the world's largest economies on their ability to absorb information and communications technology (ICT) and use it for economic and social benefit. Seventy countries are covered in the annual e-readiness rankings.

E-readiness is a measure of the quality of a country's ICT infrastructure and the ability of its consumers, businesses and governments to use ICT to their benefit. When a country uses ICT to conduct more of its activities, the economy can become more transparent and efficient. Our ranking allows governments to gauge the success of their technology initiatives against those of other countries. It also provides companies that wish to invest or trade internationally with an overview of the world's most promising business locations from an ICT perspective.

Over 100 separate criteria, both qualitative and quantitative, are evaluated for each country by the Economist Intelligence Unit's team of analysts. These criteria are scored on their relative presence (or lack thereof) in a country's economic, political or social landscape. The categories, and the individual criteria within them, are weighted according to our assumptions of their relative importance in fostering a country's information economy. Details on the methodology can be found in the appendix.

In this and previous e-readiness rankings, the Economist Intelligence Unit has worked in co-operation with the IBM Institute for Business Value and its Centre for Economic Development. "More than ever before, 2009 will in hindsight be seen as `The year of truth'," says Peter Korsten, Global Leader of the IBM Institute for Business Value. "Those that invest aggressively, competitively and wisely in ramping up connectedness and usage of the Internet and that create and drive innovative content and services will reap the benefits for many, many years to come."

June 2009

Executive summary

The past year has brought severe shocks to the economies and macroeconomic structures of countries around the world. In contrast to the last major crisis of a decade ago, however, global confidence in information and communications technology (ICT) and the virtues of digital development remains intact.

The 2009 e-readiness rankings reflect this complex environment. Digital development marches on, and millions more people across the globe continue to be connected to—and use—broadband Internet and other advanced communications technologies. But the Economist Intelligence Unit's long-established definition of e-readiness emphasises that a country's digital advancement is dependent on progress in other, interconnected areas, such as the business environment, education, support for innovation, legal frameworks, and government policy and vision. In part because of the wide-scale deterioration of countries' business environments over the past 12 months, the e-readiness scores of all but nine of the 70 countries in the study have declined in 2009.

But scores also fell because this year's rankings now cover ICT usage in addition to availability. The availability of technology is not enough to deliver the full socioeconomic benefit to countries that ICT can provide. For this, digital technologies must be used, and used effectively. Tracking actual ICT use is a tricky endeavour, but we have introduced several new indicators this year which compare countries on the extent to which their businesses and individuals use online channels. Since technology usage tends to lag availability, countries' e-readiness scores have declined further.

This confluence of factors has also led to a shuffling of places in the rankings table. Denmark has reclaimed the world's e-readiness leadership in 2009, a position it relinquished to the US last year. Other north European countries such as Sweden (2nd), the Netherlands (3rd) and Norway (4th)—having, among other attributes, high levels of ICT usage—have reaffirmed their places among the top ten e-readiness countries or, in the case of Norway, have advanced into this tier. Meanwhile, the US (5th) and UK (13th), whose business environments have been hit particularly hard in the past year, have fallen a few rungs.

Other major findings from this year's e-readiness analysis are highlighted below.

- **Emerging markets continue to rack up the biggest advances in connectivity, or the extent to which people are connected to communications networks.** Progress in the "connectivity and technology infrastructure" category of indicators is particularly notable in the Middle East and Africa,

eastern Europe and Latin America. But there remains a large gap between these and mature markets, which may have a negative knock-on effect on the usage scores of less well-connected countries.

- **Government ICT strategy in emerging markets is bearing fruit.** Most countries are making progress in implementing e-government programmes, and a few developing countries keep pace or even outperform the e-readiness leaders in some areas. The governments of Mexico (40th), Jordan (50th) and Vietnam (64th), for example, have made substantial progress in recent years in making digital channels available to citizens for information provision and consultation ("e-participation").

- **ICT development may benefit from the recession.** Many countries' economic stimulus packages designed to hasten recovery—notably in rich-world countries hardest hit by recession, such as the US—have big ICT infrastructure projects wrapped up in them. But generally, all new stimulus-driven infrastructure spending, including on railways, power plants and other projects—incorporates a lot of ICT.

- **Policy concerns exist on the near and longer horizons.** Protectionism risks are growing in the global economy, and measures are afoot in some countries— China (56th), for example—to increase protection of local ICT industries. Some stimulus programmes may also have a protectionist sting in their tail. Policymakers remain concerned that ICT providers are not doing enough to ensure the privacy and integrity of customer data. Finally, there is mounting concern about the environmental impact of digital devices and networks.

After many years of rapid growth and demonstration of its tangible benefits, ICT is now accorded a "strategic" role in most economies. This prominence is bringing a greater level of scrutiny of technology infrastructure from various sections of society, as well as international organisations. E-readiness will advance, but governments should take care to ensure that their countries' digital development proceeds in harmony with their social, economic and political objectives.

What's changed in 2009?

In the spirit of ensuring that the e-readiness rankings keep pace with trends in the digital world, we have made several changes to our methodology in 2009:

- Three new "usage" indicators have been added to the "consumer and business adoption" category: use of Internet by consumers, use of online public services by citizens and use of online public services by businesses (see box on page 20). Two previously existing indicators assessing the availability of online public services for citizens and businesses have been moved to the "government policy and vision" category.
- An "e-participation" indicator has been added to the government policy and vision category, which compares countries on the extent to which citizens are engaged in the political process through digital channels. This is based on the UN e-participation index (see page 13).
- An indicator of international Internet bandwidth per head has been added to the "connectivity and technology infrastructure" category (see page 17). Elsewhere in this category, erstwhile measures have been eliminated—personal computers, due to doubts about this indicator's relevance to e-readiness, and WiFi hotspots, due to concerns with data comparability.
- The "educational level" indicator in the "social and cultural environment" category has been broadened to incorporate data on gross enrolment in education, in addition to the existing measure of school life expectancy.
- The "electronic ID" indicator, previously housed in "connectivity and technology infrastructure", has been moved to the "legal environment" category. Also in this category, the indicator "laws covering the Internet" has been recalibrated to focus exclusively on cybercrime, data privacy and anti-spam legislation.
- To ensure that the new indicators are in proper balance with the others, we have reviewed and in some cases adjusted indicator weights in a few categories. Lastly, we have moved from a 1-5 to a 1-10 scoring scale for all indicators, in order to allow for a greater level of scoring granularity.

Economist Intelligence Unit e-readiness rankings, 2009

Scoring criteria categories and weights

Category	Weight
Connectivity and technology infrastructure	20%
Business environment	15%
Social and cultural environment	15%
Legal environment	10%
Government policy and vision	15%
Consumer and business adoption	25%

Source: Economist Intelligence Unit, 2009

Economist Intelligence Unit e-readiness rankings and scores, 2009

2009 rank (of 70)	2008 rank	Country	2009 score (of 10)	2008 score
1	5	Denmark	8.87	8.83
2	3	Sweden	8.67	8.85
3	7	Netherlands	8.64	8.74
4	11	Norway	8.62	8.60
5	1	United States	8.60	8.95
6	4	Australia	8.45	8.83
7	6	Singapore	8.35	8.74
8	2	Hong Kong	8.33	8.91
9	12	Canada	8.33	8.49
10	13	Finland	8.30	8.42
11	16	New Zealand	8.21	8.28
12	9	Switzerland	8.15	8.67
13	8	United Kingdom	8.14	8.68
14	10	Austria	8.02	8.63
15	22	France	7.89	7.92
16	19	Taiwan	7.86	8.05
17	14	Germany	7.85	8.39
18	21	Ireland	7.84	8.03
19	15	South Korea	7.81	8.34
20	20	Belgium	7.71	8.04
21	17	Bermuda	7.71	8.22
22	18	Japan	7.69	8.08
23	23	Malta	7.46	7.78
24	28	Estonia	7.28	7.10
25	26	Spain	7.24	7.46
26	25	Italy	7.09	7.55
27	24	Israel	7.09	7.61
28	27	Portugal	6.86	7.38
29	29	Slovenia	6.63	6.93
30	32	Chile	6.49	6.57
31	31	Czech Republic	6.46	6.68
32	38	Lithuania	6.34	6.03
33	30	Greece	6.33	6.72
34	35	United Arab Emirates	6.12	6.09
35	33	Hungary	6.04	6.30
36	36	Slovakia	6.02	6.06
37	37	Latvia	5.97	6.03
38	34	Malaysia	5.87	6.16
39	41	Poland	5.80	5.83
40	40	Mexico	5.73	5.88
41	39	South Africa	5.68	5.95
42	42	Brazil	5.42	5.65
43	43	Turkey	5.34	5.64
44	49	Jamaica	5.33	5.17
45	44	Argentina	5.25	5.56
46	50	Trinidad & Tobago	5.14	5.07
47	48	Bulgaria	5.11	5.19
48	45	Romania	5.07	5.46
49	47	Thailand	5.00	5.22
50	53	Jordan	4.92	5.03
51	46	Saudi Arabia	4.88	5.23
52	58	Colombia	4.84	4.71
53	51	Peru	4.75	5.07
54	55	Philippines	4.58	4.90
55	52	Venezuela	4.40	5.06
56	56	China	4.33	4.85
57	57	Egypt	4.33	4.81
58	54	India	4.17	4.96
59	59	Russia	3.98	4.42
60	63	Ecuador	3.97	4.17
61	62	Nigeria	3.89	4.25
62	61	Ukraine	3.85	4.31
63	60	Sri Lanka	3.85	4.35
64	65	Vietnam	3.80	4.03
65	68	Indonesia	3.51	3.59
66	64	Pakistan	3.50	4.10
67	67	Algeria	3.46	3.61
68	70	Iran	3.43	3.18
69	66	Kazakhstan	3.31	3.89
70	69	Azerbaijan	2.97	3.29

Note: A four-decimal score is used to determine each country's rank.
Source: Economist Intelligence Unit, 2009.

Introduction

Since the Economist Intelligence Unit began examining the role that information and communications technology (ICT) plays in driving the world's economies—their e-readiness—there has been a sea change in the availability and distribution of digital technology around the world. The number of digital access devices and the availability of digital services have swiftly spread beyond early-adopting consumer segments (and early-adopter countries) to achieve something close to pervasiveness. When our first e-readiness ranking was published, there were less than 700m mobile phones, most of them in the rich world. Today, more people have a mobile device than do not, and the distribution has spread mightily throughout the developing world—nearly one-half of all mobile subscribers are in Asia, and around 10% each in Africa and Latin America.

Internet—and importantly, broadband—subscriptions have also swelled since we started tracking nations' "connectivity" levels—or the extent to which people are connected to telecommunications networks and the Internet. From less than 20,000 at the start of this decade, the number of fast Internet connections worldwide surpassed 400m last year. Such expansion of mobile and Internet penetration has predictably brought a manifold increase in the volume of data the world consumes.[1]

The digital economy is now firmly welded to the hull of the "real" economy. Consumers do not simply have an Internet connection and a mobile phone—they use these to increase their personal efficiency, whether to keep up with friends, check the weather, pay their taxes or make a purchase. Moreover, because digital tools are so widely available, everyone in the ecosystem—businesses, governments, individuals—seeks to operate through digital channels whenever possible.

Usage of digital technology appears widespread. However, further analysis reveals instances where technologies are being deployed and services rolled out that remain underutilised. Getting people to use the available digital channels is key to unlocking the true value of ICT, but countries around the world are far from maximising utility. Even in technologically developed societies, usage levels may be high for some technologies but low for others.

In recognition of the critical importance of technology usage in the digital economy, we have made an adjustment to the e-readiness ranking model. This year, to complement our established measures of ICT availability, we are introducing several new indicators that compare countries on the extent to which their businesses and individuals use online channels. As a result, the "consumer and business

[1] The figures cited in this and the previous paragraph are from Pyramid Research.

adoption" category in our model is now heavily weighted for three new "usage" indicators. It also shows up in our assessment of each country's policy environment (in measuring the phenomenon of "e-participation", or e-democracy).

In making these and other refinements to the model, we have once again raised the e-readiness bar. Almost all countries in the ranking have suffered a decline in scores, partly because usage levels are rarely as high as availability. (A significant deterioration in business environments is the other major reason for the declines.) Because of this, a direct comparison of results between this year and previous years is difficult. But incorporating estimates of usage into our assessment is necessary to provide a better—and more holistic—picture of the progress countries are making in deriving value from ICT.

Key points

- **Business environments have deteriorated across the world in the past year, contributing to a decline in the e-readiness score in most countries.**
- **In the legal area, west European countries are spearheading international efforts to combat cybercrime and are acting to strengthen data privacy protection.**

Adapting to a tougher environment

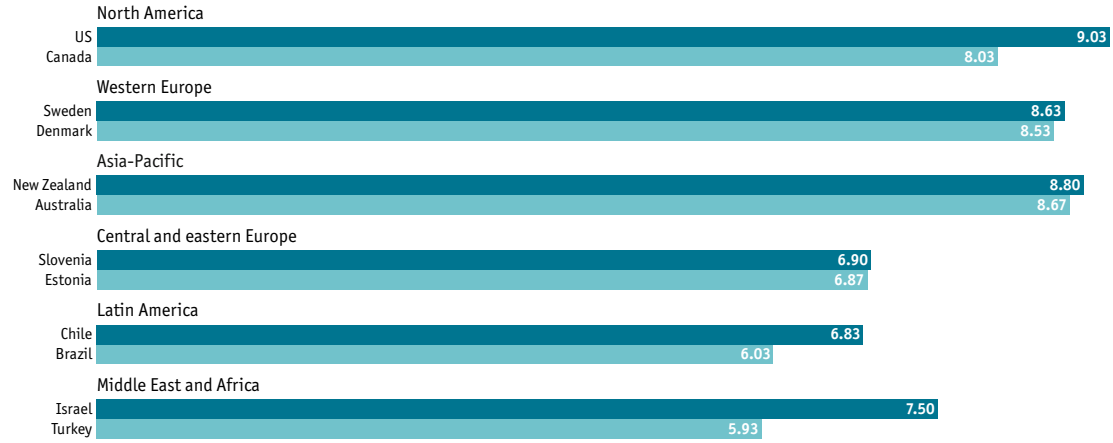
The Economist Intelligence Unit has long maintained that a stable and transparent business environment is essential to fostering development and utilisation of digital technologies and services. The premise is simple—good digital business needs the same enabling platform as good "traditional" business. This measure, unfortunately, underpins a major reason that e-readiness scores dropped this year, as all countries registered a decline in their business environment scores. The falls have been particularly precipitous in the markets worst hit by the crisis—the UK's score dropped by 1.58 points over last year—a nearly 20% decline—and countries such as the US, Austria (14th) and Ireland (18th) lost nearly a full point (declines of roughly 10%). But emerging-market business environments have also suffered.

The financial crisis has constricted availability of credit, it has caused governments to entertain protectionist sentiment and legislation, and it has generally dampened foreign investment and private enterprise policy. This has been a primary reason—along with the aforementioned introduction of usage indicators—that all but nine of the 70 countries in the e-readiness rankings suffered drops in

Regional e-readiness leaders: business environment
(score)

Source: Economist Intelligence Unit 2009.

Regional e-readiness leaders: social and cultural environment
(score)



Source: Economist Intelligence Unit 2009.

Regional e-readiness leaders: legal environment
(score)

their overall scores from last year, including significant falls for many in the top ten, such as the US, Australia (6th), Singapore (7th) and Hong Kong (8th).

Other critical parts of the e-readiness environment are social and cultural factors, such as support for innovation, and the legal frameworks governing both the traditional and digital economies. The 2009 e-readiness leaders perform strongly in these areas. Denmark, for example, has excelled in nurturing new businesses. According to the World Bank, in 2008 it took only six days to register a start-up in Denmark and involved no cost.[2] According to the European Commission, the average registration time in the EU as a whole was nine days and cost €463 in fees in 2008.

Fostering innovation can take other directions: in another Scandinavian e-readiness leader, Finland (10th), the Funding Agency for Technology and Innovation is helping a local mobile technology giant, Nokia, to unload its unwanted intellectual property by financing start-ups that could acquire patents

[2] The World Bank, *Doing business 2009*.

Protecting data—the Phorm factor

European governments are increasingly concerned that as telecommunications carriers and firms with Internet-based business models seek to increase their revenue from customers, they invade the latter's privacy in the process. The EU is currently investigating the usage of "deep-packet inspection" technologies by communications and content companies. Deep-packet systems such as Phorm allow firms to track and analyse a consumer's web-surfing habits in order to deepen their understanding of online purchasing behaviour. Internet service providers (ISPs) and media companies in the UK have been particularly strong proponents of Phorm, and this has led the EU formally to request the UK government to take steps to enforce EU guidelines on personal data security and privacy.

and technology that Nokia does not wish to invest further in.

Innovation often takes its cue from circumstance, and some of the most innovative responses to digital challenges continue to come from emerging markets. Mobile banking was pioneered not in the 3G-dense countries of Europe or North Asia, but by poor consumers in, and migrant workers from, South-east Asia and Africa who had a need for easy, efficient and safe banking, and micropayment facilities. A more recent innovator in this field is Cairo Amman Bank, a retail bank operating in Egypt (57th) and Jordan. It is the world's forerunner in implementing biometric iris identification facilities in its ATM kiosks, in order to minimise fraud and increase customer security.

When it comes to establishing the legal foundations for digital development, the challenges are also getting tougher as technologies advance and become more intrusive, usage and data volumes increase, and hackers and other "cybercriminals" become more sophisticated. In recognition of this, our model indicator "laws covering the Internet" has become more tightly focused on cybercrime, data privacy and spam, and its weight in the legal environment category has risen.

International efforts to combat cybercrime are on the rise, and west European countries have been at the forefront of co-ordination initiatives for a decade. The Council of Europe drafted the Convention on Cybercrime in 2001, and since then most EU countries have become signatories, as have the US, Japan (22nd) and others. European countries have also acted faster than others (including the US) to strengthen legal protections for the privacy of citizens' personal data in the digital age (see box).

Key points

- **Broadband investment projects as part of stimulus programmes are a recent—and mostly welcome—addition to governments' digital development strategies.**
- **Government efforts to expand interaction with citizens continue to advance, including in the area of "e-participation", a new e-readiness indicator.**

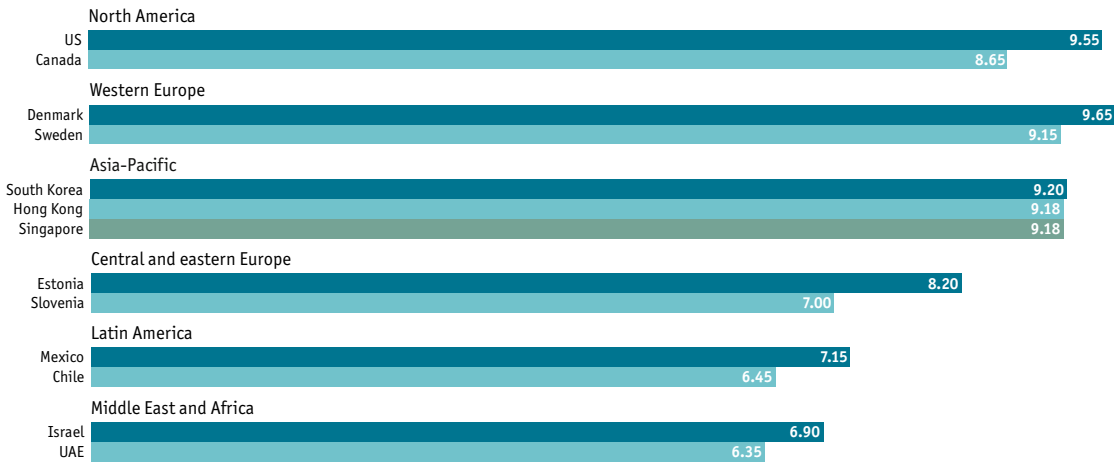
Policy adjustments and e-participation

Coherent government policies and strategies are needed to ensure that digital technologies and services reach far and wide across all a country's regions and socioeconomic groups. Long-term vision and consistent, even-handed policy implementation are called for. The recession, however, has forced governments more recently to think also about the short-term and long-term economic impact of investment in ICT programmes and infrastructure. Several rich and digitally well-endowed countries are using ICT infrastructure spending as a form of economic stimulus. These include Taiwan (16th), which has launched a project to blanket every major city with wireless broadband infrastructure, and the US, where Congress has earmarked US$7bn of a larger stimulus programme to fund broadband rollout projects.

Many governments are also striving to expand the scope of "e-participation"—the use of ICT by citizens to engage in the political process. In recognition of the growing use of digital technology in political life, the Economist Intelligence Unit has incorporated the UN's e-participation index scores in the rankings model this year.[3] This indicator assesses the quality and usefulness of information and services provided by governments for the purpose of engaging citizens in the public policymaking process.

[3] We are grateful to the United Nations Department of Economic and Social Affairs (UNDESA) for their permission to incorporate the e-participation scores for 68 countries (from the UN e-government survey 2008) in our e-readiness model.

Regional e-readiness leaders: government policy and vision
(score)



Source: Economist Intelligence Unit 2009.

Adjusting e-government strategy for the downturn

While many governments view their e-government programmes as a primary catalyst for ICT adoption, some also see them as a form of stimulus for economic recovery. The government of Chile (30th) launched the long-term Digital Agenda 2.0 project in 2007 with the aim of increasing local awareness of e-government and digital education services, but many of the programme's more recent initiatives, launched since the onset of the financial crisis, are taking the form of direct handouts, including investment in Internet adoption programmes for export-oriented small firms. South Korea (19th), meanwhile, is seeking to change the thrust of its e-government initiatives in response to the current economic crisis: part of a job-creation programme will involve spending 1.2% of its supplementary budget on information technology (IT) projects, and the government is also looking to invest in digital back-office process-improvement efforts that will trim Won13trn (US$9.5bn) from government operational costs over the next four years.

The US outperforms all other countries in the UN's 2008 e-participation index. Its top rank is based on the volume and breadth of policy information made available electronically by the national government, and the opportunities it provides citizens for web-based feedback and consultation on policy issues. South Korea and Denmark are second and third, respectively, in the UN's e-participation index.

There are success stories from the emerging markets as well. Jordan leapt from 90th place in 2005 to 15th in the 2008 UN e-participation index, and Vietnam from 63rd to 16th place. The UN has praised both governments for, among other things, putting in place enhanced national portals with dedicated citizen consultation sections. Mexico is another stand-out (7th in the UN e-participation index), having established multiple information and outreach portals moulded around individual constituencies through its eMexico programme.

In general, the concept of e-participation is broadening out to encompass political awareness campaigns using Web 2.0 and other social media. Many have cited the entire election campaign of the US president, Barak Obama, as an e-participation "tour de force", and the Democratic Party credits online awareness and registration campaigns with a hugely successful effort to engage US citizens abroad.

Energy watch

ICT is often used to create innovative solutions to environmental challenges, such as remote monitoring devices to control energy use. But policymakers do not always view ICT in a positive light, as evidenced by attempts to get governments to curb the energy consumption of ICT devices and the industry as a whole. In a recent report, the International Energy Agency (IEA) issued a plea to world governments to increase energy-efficiency measures for computers and mobile phones. It estimates that worldwide usage of ICT and consumer electronic devices will consume 1,700 tw of energy in 2030, three times their current level and roughly equivalent to the combined energy consumption of the US and Japanese economies today. Rapid digital development and intensified global climate-change activity are combining to illuminate ICT's overall impact—both positive and negative—on society as a whole.

But the economic crisis has, unfortunately, also given rise to government actions that could hinder future digital development. These include threats by some governments to introduce protectionist regulations, raise tariffs and take other measures that are counterproductive to international trade, affecting all types of products, including ICT. In January 2009, China's National Certification and Accreditation Administration put forward its intent to require product certification for 19 different types of information security products, covering everything from firewall software to routers. While certification is innocuous by itself, the speed with which China planned to implement this regulation, and its scope, has many industry players worried that certification will be used to block or slow the introduction of competitive foreign technology into the Chinese market.

By and large, most governments remained focused on implementing policy that enables, rather than hinders, e-readiness. Expanding the scope of interaction with citizens and businesses in the provision of e-government services is one area where most countries continue to move forward. (The actual use of such services, however, is a long way from matching their availability, as will become clear later in this report.)

Key points

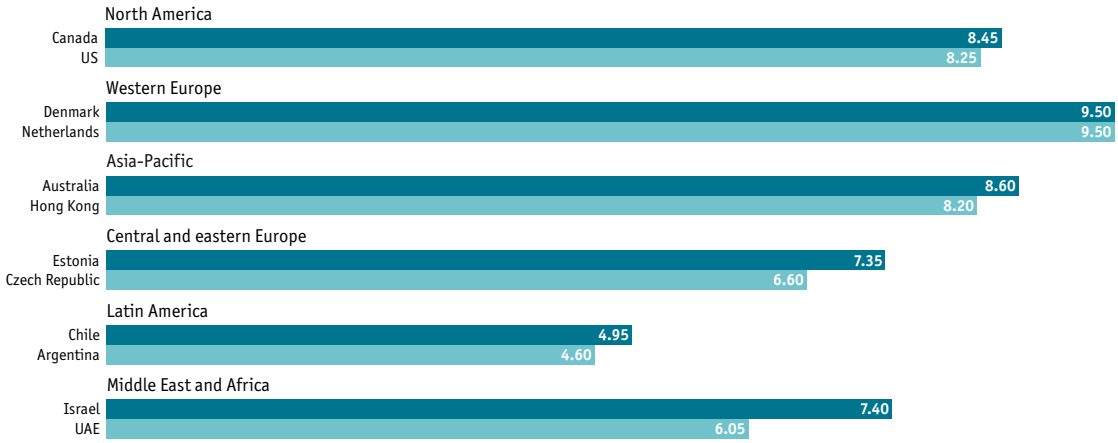
- **Broadband and mobile connectivity levels continue to increase for almost all countries, notwithstanding the downturn.**
- **Capacity bottlenecks and the persistence of "walled garden" approaches could, however, stunt adoption of some technologies in the future.**

Technology availability rises

Despite the economic slowdown, connectivity levels advanced across most countries in our index this year. Changes and reweighting of model indicators used to measure connectivity and technology infrastructure (see the appendix for details) resulted in one-off score declines in this category for a few countries. Nonetheless, actual penetration of mobile phones and broadband Internet, and the affordability of broadband to households, has continued to rise just about everywhere.

Broadband penetration now exceeds 20% of the population of most OECD countries, and in a handful of European markets—notably Denmark and the Netherlands—the rate is starting to approach 40%. Improving access to a fast Internet connection, however, is still a work in progress for most countries (see the box below on Australia's fibre-network tender). South Korea is famously broadband-rich, and the next stage of the country's Internet development should be instructive for all fast-growing broadband markets: regulators and carriers are working to establish a new policy framework, which among other things may mandate that broadband becomes part of carriers' universal service obligations—recognition, in other words, that broadband access is a fundamental need of citizens.

Regional e-readiness leaders: connectivity and technology infrastructure
(score)



Source: Economist Intelligence Unit 2009.

Painful adventures with next-generation networks

Boosting investment in telecoms infrastructure should also be a boon for service providers and good for long-term digital development. If not handled well by government, however, such programmes can cause more grief than goodwill. A case in point is Australia, where the government recently set itself in opposition to the country's main operators and various state governments in a contentious tendering process for a US$5bn fibre-to-the-node (FTTN) national network. While seen as a boon to Australia's residential—and particularly rural and remote—Internet access markets, the government irked existing industry participants as they spent considerable time and money on tenders, only to find out that the government did not select any of them and opted to build the network itself—at a projected cost of six times the figure in the original tender. This created discord where stimulus and co-operation were sought.

One new indicator in our model this year is an estimate of the international Internet bandwidth available to countries on a per-head basis. On this measure, some digitally developed countries fare surprisingly poorly. Many Asia-Pacific markets in particular suffered a decline in their overall connectivity scores because of this, underscoring the need to increase Internet capacity to a region that brings more Internet users online than any other part of the world.

International bandwidth is important to the e-readiness equation partly because of the explosion of Internet traffic on the world's networks. The increased popularity of file-sharing (particularly of videos) and Web 2.0 sites such as Facebook, MySpace and above all YouTube, is a major driver of this upsurge. Increasingly, however, these sites have been scaling back the content and services that can be accessed by their customers outside of the US.[4] The commercial logic is unassailable: while the user-generated content of these social utility sites is effectively free, the hosting of exabytes of travel photos, graphics and videos generated by their millions of users is not, and many of these are increasingly in poorer countries that do not interest advertisers as much as users in the US. Facebook spends millions of dollars on bandwidth each month,[5] and some analysts estimate that YouTube will lose as much as US$470m in 2009 because of the escalating data centre acreage it requires.[6] The global Internet will not grind to a halt as a result of capacity shortages, but many countries and network owners will need to address real existing bottlenecks.

As in previous years, emerging markets set the pace in connecting people to mobile-phone networks. The ten largest mobile operators in the Middle East and Africa are now collectively adding over 12m new customers every quarter; net new mobile subscribers in Nigeria (61st) in 2008 accounted for nearly 20% of the annual figure for that entire region.[7] Despite millions of new subscribers, however, the developing world still has a long way to go in establishing a solid foundation of connectivity. There remains a large gap between emerging and mature markets in their overall connectivity scores (over three points on our 10-point scale, with a grouping of mature markets in our index averaging 7.7 and a grouping of "high-growth" markets averaging 4.7).

Worryingly, mobile carriers and content developers still try to corral users towards service plans and applications that incur per-minute or megabyte charges, and block access to the fully public—and still largely free—Internet. Microsoft, for example, recently barred 12 applications through its Windows Marketplace for Mobile—including VoIP (voice over Internet protocol) applications, and those that

[4] "At outer reaches of Web, profits vanish," *International Herald Tribune*, April 28th 2009.

[5] "Facebook: $20 million a year on data centers," *Data Center Knowledge* website, May 18th 2009.

[6] "YouTube may lose $470 million in 2009: analysts", *Multichannel News* website, April 3rd 2009 (citing a report issued by Credit Suisse)

[7] Pyramid Research, Africa Middle East Mobile Forecasts, March 2009.

would change a mobile device's default browser from Internet Explorer. Such moves are a concern, in that they could potentially reverse the e-readiness gains made by the steady increase in inter-operability of IT and communications platforms, and the growing acceptance of open-source software.

Key points

- **Access to ICT does not mean usage of it, but when connectivity increases usage tends to increase with it, in rich and developing worlds alike.**
- **Recent smartphone trends suggest that usage of mobile devices can expand to fit the channel available to the consumer.**

Technology usage lags

Connectivity does not equal utility, although it is a primary determining factor. There is an undeniable link between the creation of ubiquitous ICT access environments and the increased utility of digital channels. An estimated 7% of the entire value of EU retail sales, for example, takes place online. Europe's top markets for electronic banking are also in the top ten of the e-readiness rankings. According to the European Commission, 70% or more of total Internet users in Norway, Finland and the Netherlands (in other words, the majority of their populations) do their banking online.[8]

Seventeen of the top 20 countries in the "consumer and business adoption" category of our model—which incorporates the new "usage" indicators (see box on the following page)—are also in the top 20 in the "connectivity" category. In most of these countries, the ratio of their connectivity scores to those in consumer and business adoption is close to one. Although an imperfect measure (each category contains a variety of different indicators), this suggests some correlation between availability and usage, and that higher degrees of connectivity may beget higher degrees of usage.

Conversely, 14 of the lowest consumer and business adoption scorers also feature among the lowest 20 scorers in connectivity. Many of the poorest served markets in terms of access are clustered

[8] The figures in this paragraph are sourced from the European Commission, in its press release of March 5th 2009, and from Eurostat, *Data in focus*, 46/2008.

Regional e-readiness leaders: consumer and business adoption
(score)

Source: Economist Intelligence Unit 2009.

in eastern Europe and Asia—including Ukraine (62nd), Pakistan (66th), Iran (68th) and Kazakhstan (69th). They have poor track records in terms of overall connectivity expansion programmes, underpinned by governments that are variously indifferent—and sometimes even hostile—to expanding access to digital channels for its citizens.

When connectivity increases, the usage of online commerce and government sites also increases. China's broadband subscriber population of nearly 90m is growing by 1.5m each month. Market Avenue, a Chinese market research company, estimates that the value of online sales revenue of clothing more than doubled in the last year to Rmb17bn (US$2.4bn). It also reckons that the number of online shoppers grew by 79% in 2008 to over 49m, and it predicts that roughly 15% of the population will regularly shop for clothing online by 2011.[9]

There is also evidence that usage sometimes—although certainly not always—expands to fit the capacity of the channel that is available to the consumer. In rich markets, there has been a marked increase in the availability of applications for smartphones, which has in turn sparked increased usage of mobile data services. More than 1bn iPhone applications have been downloaded since the launch of Apple's iconic mobile device in mid-2007, and this has spurred the consumption of multimedia content on the go. According to M:Metrics, a research firm, nearly 85% of iPhone purchasers surveyed six months after the product was launched used the device to access news, 50% used a social networking site and 30% watched videos. This varied massively from the general mobile population, where only 13% used their phones for accessing news, and less than 5% had either watched a video or accessed a social networking site.[10]

[9] Market Avenue, *2008 Report on China's garment e-commerce market.*

[10] M:Metrics press release, March 18th 2008.

Measuring usage: challenges and solutions

In order to capture, at least in part, the extent to which populations actually use digital channels and services in countries, the Economist Intelligence Unit has introduced three new indicators to the e-readiness model.

- *Use of Internet by consumers:* The range of Internet features used by individuals—such as e-mail, transactional sites and social networking sites—and the extent of online purchasing.
- *Use of online public services by citizens:* The extent to which citizens use available e-government services such as tax filing, job search or car registration, among others.
- *Use of online public services by businesses:* The extent to which businesses make use of digital platforms for VAT filing, company registration, online procurement and other forms of government interaction.

Objective and comparable data across countries are difficult to find for these types of usage indicators. Surveys of individuals and businesses on their Internet usage behaviour are often the only form of quantitative measure available, and these are not conducted in all countries. For this reason, Economist Intelligence Unit analysts have used their deep knowledge of each market, and any available surveys or other estimates, to assign qualitative scores on usage.

Conclusion

This year's e-readiness rankings tell a story that is consistent with the trajectory of the global economy. The severe financial crisis and resulting recession have struck most countries hard, having a considerable negative impact on their business environment scores. This is part of the reason, along with the changes to the model, that countries as varied as the US and Saudi Arabia (51st) have seen their scores decline while dropping several places in the rankings.

But digital development marches on. Connectivity continues to improve, and remains the major enabling factor for any country's ability to improve its e-readiness. Availability, however, is not enough to reap the full benefits of the ICT equation. As a result, this year we raised the bar by introducing several usage indicators to gauge the extent to which businesses and consumers alike are utilising digital channels. Analysis shows that usage lags connectivity levels—another reason that overall scores have dropped this year—but that users around the world are finding increasing utility nonetheless, even in countries in the lower tiers of our ranking table. While usage levels are still in their infancy, encouraging signs are seen, ranging from e-participation efforts to actual use of online public services.

In rich and poor countries alike, however, thorny policy issues arising from the very success of digital development remain largely unresolved. Widespread Internet usage, for example, naturally motivates telecoms carriers and content providers to explore ways to obtain more information—and thus sales—from their customers. The delicate social contract between digital consumers and the operators of digital channels will be tested in the coming years, as intensified revenue pressure increases service providers' need to utilise the Internet for intrusions that are both annoying (for example, inbound advertising) and potentially privacy-infringing ("deep-packet" inspection systems).

The environmental impact of ICT usage is also likely to remain a concern for governments as long as climate change and carbon reduction remain high on the global agenda. As the digitally connected world watches more videos and transfers more files, it consumes more energy. The expansion of one of the global economy's most essential resources—information—is having an unintended knock-on effect on other precious resources. The interplay between these two resource ecosystems underscores once again the reality that e-readiness is not fostered in a digital vacuum, but rather in a complex web of social, cultural, economic and political factors, ultimately driven by the usage imperative.

Appendix 1: Methodology and category definitions

The e-readiness rankings model consists of over 100 separate quantitative and qualitative criteria, all but one of which are scored by the Economist Intelligence Unit's regional analysts and editors, and are organised into six primary categories. The 38 indicators and 81 sub-indicators are, in turn, weighted according to their assumed importance as influencing factors. Major data sources include the Economist Intelligence Unit, Pyramid Research, the World Bank, the United Nations and the World Intellectual Property Organisation, among others.

The rankings methodology has undergone significant change in 2009 in order to better reflect the use of digital technology in countries, in addition to its availability and the environmental factors which affect it. The changes are detailed in the Executive summary, on page 6.

The six categories (and their weights in the model) and criteria are described below.

1. Connectivity and technology infrastructure

Weight in overall score: 20%

Category description: Connectivity measures the extent to which individuals and businesses can access mobile networks and the Internet, and their ability to access digital services through means such as digital identity cards. Effective access uses two primary metrics: penetration and affordability. Penetration of each market's mobile-phone subscriptions, overall Internet users and broadband Internet accounts are ranked as a percentage of the total population. We feel that this "basket" of connectivity is the optimal representation of the extent to which voice and data services are accessible to a country's residents. The affordability of the lowest-priced broadband subscription, measured as a percentage of an average household's median income, is used as the overall measure of digital service affordability. The penetration of secure Internet servers in the population is also used as a reference indicator of the extent to which reliable digital transactions can be made in each market. International Internet bandwidth is an indicator of the ability of a country's networks to carry the burgeoning volume of data traffic originating from within and outside of its borders.

Category criteria: Broadband penetration; broadband affordability; mobile-phone penetration; Internet user penetration; international Internet bandwidth; Internet security.

2. Business environment

Weight in overall score: 15%

Category description: In evaluating the general business climate, the Economist Intelligence Unit screens 74 sub-indicators to provide a comprehensive and forward view of each country's attractiveness as a trading economy and as a destination for business investment from 2009 to 2013. The criteria covers such factors as the strength of the economy, political stability, taxation, competition policy, the labour market, and openness to trade and investment. The aggregate scores of the individual sub-indicators are grouped into nine higher-level indicators, shown below. Updated quarterly as part of the Economist Intelligence Unit's Country Forecast Service, these rankings have

long offered investors an invaluable comparative index for over 60 major economies.
Category criteria: Overall political environment; macroeconomic environment; market opportunities; policy towards private enterprise; foreign investment policy; foreign trade and exchange regimes; tax regime; financing; the labour market.

3. Social and cultural environment
Weight in overall score: 15%
Category description: Basic education is a precondition to being able to utilise Internet services, but this category also considers a population's web-literacy—its experience using the Internet and its receptivity to it—and the technical skills of the workforce. These technical skills are evaluated by both evidence of the familiarity of a country's population with information technology (IT) applications and the extent to which its schools and governments provide the education infrastructure to engender it. Continued from previous years is an assessment of entrepreneurship, while our scoring of innovation levels in each market (measured by the number of patents and trademarks registered, as well as the level of spending on research and development, R&D) evaluates how well the society fosters creative business activity that can lead to the creation of intellectual property, new products and industries.
Category criteria: Educational level (measured by school life expectancy and gross enrolment in education); Internet literacy; degree of entrepreneurship; technical skills of workforce; degree of innovation (measured by the generation of patents and trademarks, as well as R&D spending).

4. Legal environment
Weight in overall score: 10%
Category description: E-business development depends on both a country's overall legal framework and specific laws governing Internet use. This category reflects those legal frameworks that have a direct impact on the use of digital technology to inform, communicate and transact business. Governments need to be forward-thinking in their creation of legal frameworks to cater to Internet commerce. These include legislative approaches to such issues as cybercrime, data privacy and spam, but just as importantly countries need to create a legal atmosphere that works to minimise abuses and non-competitive behaviour, including provisions covering consumer protection and legal jurisdiction. E-ready countries are those that allow businesses and individuals to move nimbly and freely, where there is little bureaucracy to interfere with the registration of a new business or restrict access to information. The commitment of the country to implementing digital identity cards is also considered as a means of determining how a country's population can access digital commerce and digital government services.
Category criteria: Effectiveness of traditional legal framework; laws covering the Internet; level of censorship; ease of registering a new business; electronic ID.

5. Government policy and vision
Weight in overall score: 15%
Category description: E-ready governments supply their constituents—citizens and organisations—with a clear roadmap for the adoption of technology, and they lead by example in their use of technology to create efficiencies. The Economist Intelligence Unit assesses the activities of

governments in this area, and their ability to lead their countries towards a digital future. Are governments employing technology to operate and provide public services with less resource investment? Are they spending on ICT to stimulate similar spending in the greater economy? Are "savings" translated into service gains for citizens? Can more people interact with, and receive information from, the government regardless of their own access to technology? This category also analyses, in each country, the availability of digital channels to individuals and businesses for accessing public services, and to citizens for obtaining government information about civic issues and engaging in consultation with government officials on matters involving the political process.
Category criteria: Government spend on ICT per head; digital development strategy; e-government strategy; online procurement; availability of online public services for citizens and businesses; e-participation (based on the UN e-participation index).

6. Consumer and business adoption
Weight in overall score: 25%
Category description: If connectivity, societal adoption, and legal and policy environments are necessary enabling platforms for e-readiness, then the actual utilisation of digital channels by people and companies is a measure of successful implementation. The Economist Intelligence Unit looks at the amount that businesses and consumers spend on accessing ICT services, the extent and range of Internet features used by individuals, their online purchasing activity, and the extent to which individuals and businesses use the online public services that have been made available.
Category criteria: Consumer spending on ICT per head; level of e-business development; use of Internet by consumers (assessing both the range of Internet features used by individuals and their online purchasing activity); use of online public services by citizens and businesses.

Appendix 2: Category scores

Economist Intelligence Unit e-readiness rankings, 2009

Category scores

	Overall score	Connectivity	Business enviroment	Social and cultural environment	Legal environment	Government policy and vision	Consumer and business adoption
Category weight		***20%***	***15%***	***15%***	***10%***	***15%***	***25%***
Denmark	8.87	9.50	8.03	8.53	8.10	9.65	8.90
Sweden	8.67	9.10	7.85	8.63	8.50	9.15	8.63
Netherlands	8.64	9.50	7.80	8.23	8.70	8.50	8.75
Norway	8.62	9.10	7.83	8.13	8.05	8.75	9.15
United States	8.60	8.25	7.65	9.03	8.70	9.55	8.60
Australia	8.45	8.60	7.96	8.67	8.50	8.70	8.33
Singapore	8.35	8.15	8.15	7.57	8.70	9.18	8.48
Hong Kong	8.33	8.20	8.20	7.47	9.00	9.18	8.28
Canada	8.33	8.45	8.16	8.03	8.25	8.65	8.35
Finland	8.30	9.10	8.17	8.40	8.25	7.45	8.23
New Zealand	8.21	7.70	7.73	8.80	8.45	8.50	8.29
Switzerland	8.15	9.35	8.06	8.10	7.93	7.45	7.78
United Kingdom	8.14	8.85	7.03	7.93	8.10	8.00	8.48
Austria	8.02	8.00	7.28	7.93	8.70	8.05	8.23
France	7.89	7.75	7.35	7.83	7.85	8.80	7.85
Taiwan	7.86	7.70	7.53	8.10	7.38	8.55	7.84
Germany	7.85	8.40	7.66	8.13	8.05	6.50	8.08
Ireland	7.84	8.30	7.62	7.73	8.00	6.75	8.25
South Korea	7.81	8.05	6.99	8.57	7.28	9.20	7.05
Belgium	7.71	8.10	7.32	7.50	8.45	7.25	7.75
Bermuda	7.71	8.60	8.04	6.63	8.35	8.35	6.80
Japan	7.69	7.15	6.82	7.90	7.55	8.60	8.04
Malta	7.46	6.60	7.17	7.10	8.20	8.15	7.83
Estonia	7.28	7.35	7.07	6.87	8.40	8.20	6.60
Spain	7.24	6.90	7.07	7.77	8.00	7.05	7.13
Italy	7.09	7.10	6.24	7.77	8.70	6.35	7.00
Israel	7.09	7.40	7.18	7.50	7.15	6.90	6.63
Portugal	6.86	6.10	6.68	6.97	8.00	6.55	7.23
Slovenia	6.63	6.25	6.86	6.90	7.15	7.00	6.23
Chile	6.49	4.95	7.71	6.83	7.40	6.45	6.43
Czech	6.46	6.60	7.17	6.70	7.08	6.10	5.75
Lithuania	6.34	6.30	6.29	6.33	7.40	6.05	6.15
Greece	6.33	5.70	5.90	7.13	7.40	5.80	6.50

	Overall score	Connectivity	Business enviroment	Social and cultural environment	Legal environment	Government policy and vision	Consumer and business adoption
Category weight		***20%***	***15%***	***15%***	***10%***	***15%***	***25%***
United Arab Emirates	6.12	6.05	7.10	5.67	5.00	6.35	6.18
Hungary	6.04	5.85	6.57	6.40	6.90	5.75	5.48
Slovakia	6.02	6.25	6.90	6.23	7.15	4.75	5.50
Latvia	5.97	6.05	6.27	6.27	7.50	5.40	5.28
Malaysia	5.87	4.80	6.81	5.57	7.00	6.05	5.80
Poland	5.80	5.75	6.92	5.97	6.78	5.50	4.88
Mexico	5.73	3.65	6.86	5.80	6.10	7.15	5.68
South Africa	5.68	4.30	5.94	5.57	7.20	5.95	5.93
Brazil	5.42	4.00	6.47	6.03	6.10	6.00	4.93
Turkey	5.34	4.85	5.94	5.93	5.45	5.35	4.98
Jamaica	5.33	5.15	5.70	5.70	6.65	5.00	4.70
Argentina	5.25	4.60	5.44	5.70	6.05	5.65	4.83
Trinidad & Tobago	5.14	4.15	6.38	5.57	6.15	5.70	4.20
Bulgaria	5.11	5.10	6.01	5.33	6.65	4.60	4.13
Romania	5.07	5.30	6.16	5.20	6.65	5.35	3.38
Thailand	5.00	3.65	6.54	4.83	6.35	5.90	4.18
Jordan	4.92	3.30	5.99	5.63	4.90	5.90	4.55
Saudi Arabia	4.88	4.30	6.16	5.50	4.75	5.50	3.90
Colombia	4.84	3.90	6.06	4.97	6.35	5.00	4.08
Peru	4.75	3.25	6.38	5.37	5.80	4.75	4.20
Philippines	4.58	2.95	6.13	4.57	4.55	5.35	4.50
Venezuela	4.40	4.05	3.86	5.03	4.70	4.90	4.20
China	4.33	2.95	6.32	5.47	5.10	4.75	2.99
Egypt	4.33	3.00	6.23	5.17	5.20	4.90	3.05
India	4.17	2.45	5.89	4.90	5.60	5.25	2.88
Russia	3.98	4.65	5.67	4.90	3.65	2.70	2.76
Ecuador	3.97	3.45	4.29	4.70	4.75	3.75	3.58
Nigeria	3.89	1.60	4.43	5.37	5.95	4.20	3.50
Ukraine	3.85	4.15	4.50	5.10	4.10	3.60	2.54
Sri Lanka	3.85	2.50	5.62	4.70	5.95	3.80	2.55
Vietnam	3.80	2.50	5.42	3.83	4.50	5.35	2.65
Indonesia	3.51	2.55	5.63	3.73	4.10	3.65	2.55
Pakistan	3.50	2.85	4.81	3.13	5.60	3.80	2.45
Algeria	3.46	3.75	4.97	4.37	3.30	2.65	2.33
Iran	3.43	3.50	4.22	5.23	3.00	2.65	2.48
Kazakhstan	3.31	3.40	4.82	4.00	3.45	3.10	1.98
Azerbaijan	2.97	2.95	4.70	3.03	3.25	2.70	1.98

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