High Tech Practice




Online and upcoming: The Internet's impact on aspiring countries

January 2012

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Executive Summary

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Preface

This report examines the impact of the Internet on a group of developing countries with both the scale and dynamism to be significant players on the global stage in the near future. It is part of a series that focuses on the impact of different, Internet-related technologies on business and the economy. It complements and builds on previous work assessing the impact of the Internet on the advanced economies, as well as China and India, which should provide a basis for comparison (see McKinsey Global Institute, *Internet matters: The Net's sweeping impact on growth, jobs, and prosperity,* May 2011).

In the four decades since its inception, the Internet has driven dramatic change. It has enabled flows of information, including entertainment, news, and financial and academic material. It has brought people closer together by enabling various forms of communication, most notably e-mail, instant messaging, video conferencing, and social networking. And it has allowed consumers to purchase virtually anything at any time, while providing producers with direct access to a wide range of markets. Furthermore, the Internet is also a bustling industry, spurred by entrepreneurship and supported by a variety of industries and large enterprises. Online productivity tools and communications advancements provide benefits to almost all enterprises and governments. Moreover, the Internet has helped governments to broaden citizen services and improve their delivery. In a very short period, it has become difficult for most of us to imagine a world without instant and continuous access to the Internet.

Much of the research on how the Internet has affected business and the economy, including our own, has focused on advanced nations or perhaps large developing countries such as India and China. In this report we turn our focus to what we call "aspiring countries," which are defined as having the economic size and dynamism to be significant players on the global stage in the near future and achieve levels of prosperity approaching those of the advanced economies. Using this definition, we identified 30 countries with a collective GDP in 2010 of $19 trillion, or 30 percent of global GDP. Many of these countries—for instance, Mexico and China—are already significant players in the global economy. However, none has yet achieved the wealth and prosperity seen in advanced economies. In seeking to understand the impact of the Internet in aspiring countries, we largely focus on how economic growth and prosperity have been affected; we also seek to discover how individuals, entrepreneurs, enterprises, as well as public-sector entities have been transformed.

In an attempt to better assess the impact, we developed case studies for nine of the 30 aspiring countries—Argentina, Hungary, Malaysia, Mexico, Morocco, Nigeria, Taiwan, Turkey, and Vietnam. These nine countries represent 20 percent of the GDP of all aspiring countries and they span the regions in which aspiring countries appear. For this sample, in addition to assessing the Internet landscape and its impact on the different groups of participants, we examine the potential for countries to leverage particular strengths of their economies to capture greater impact from the Internet. However, we do not offer prescriptive policies for countries, but rather expand and in some cases initiate dialogue within these countries on how they can further accelerate their initiatives and policies to fully capture the impact of the Internet.

In order to highlight the flurry of Internet activity in these countries, we relied on five broad sources of data: (1) we constructed macroeconomic analyses for the countries, taking into account various data related

to Internet use and infrastructure; (2) we conducted in-country microanalyses of various participants using available data; (3) we carried out a primary survey of about 2,500 SMEs (small and medium-sized enterprises) in eight of the nine focus countries; (4) we leveraged existing research from local and global institutions; and (5) we conducted interviews with experts in relevant countries. The data challenges were significant, which is not surprising for a project of this nature: we encountered incomplete data, noncomparable data, and unreliable data, and we also needed to address issues of bias and selection associated with survey-based results. We conferred with multiple sources and reviewed our findings with experts and institutions throughout the process; we also conducted sensitivity analyses. As a result, we are relatively confident that the findings are directionally robust. However, there is a clear need to conduct further research and capture more data given the growing importance of the Internet and its transformational impact. To help with ongoing research, we have attempted to create some useful indices that can be used to track the impact and development of the Internet (e.g., iGDP, which measures the Internet's contribution to an overall economy; e3, which measures the strength of a country's current ecosystem; i4F, which assesses the strength of the foundations of the Internet in a country; e-commerce platform, which tracks the health of e-commerce foundations in a country; ease of Internet entrepreneurship, which measures the ease of starting and financing an Internet-related business). We have also developed a framework for assessing the macroeconomic strengths of different countries that can be leveraged to fully capture the impact of the Internet (e.g., wealth in natural resources, position as a hub of trade, innovation potential, strength in local consumption, and a strong SME sector). It is important to note that the examples we cite in this report are by no means comprehensive or intended to be considered the most compelling. Their purpose is to illustrate types of innovations and developments we found at the time of writing.

This is an independent McKinsey & Company report that draws on research from McKinsey's High Tech Practice, information from academic and public sources; research conducted with Google; and work from the McKinsey Global Institute (MGI), the business and economics research arm of McKinsey. Without the contributions of academics and researchers cited throughout the report, our effort would not have been possible.

The project was led by Olivia Nottebohm, a McKinsey principal in Silicon Valley; James Manyika, a McKinsey and MGI director in San Francisco; Jacques Bughin, a McKinsey director in Brussels; and Michael Chui, a senior fellow at MGI in San Francisco. Abdur-Rahim Syed managed the project team of Mitra Mahdavian, Lionel Guillou, Aaron Berger, Julia Huang, and Nirant Gupta. The core team worked closely with in-country colleagues in McKinsey's High Tech Practice, including Acha Leke, a director in Lagos; Bengi Korkmaz, a principal in Istanbul; Matias Satz, a principal in Buenos Aires; Olazhir Ledezma, a principal in Mexico City; Suraj Moraje, a principal in Johannesburg; Juan Bertiche, an associate principal in Buenos Aires; Nuno Goncalves Pedro, a senior expert in Beijing; and Othmane Mikou, an engagement manager in Casablanca. We are also grateful for the insights of Nicklas Lundblad, Betsy Masiello, and Jonathan Hall at Google.

We are grateful for the review, challenge, and advice provided by our academic advisers for this research: Martin Baily, a senior adviser to McKinsey and a senior fellow at the Brookings Institute; Bill Dutton, a professor of Internet studies at the University of Oxford; Nahed Azab, an assistant professor at American University in Cairo and an expert in e-government; and Hal Varian, the chief economist at Google and an emeritus professor in the School of Information, the Haas School of Business, and the Department of Economics at the University of California at Berkeley.

McKinsey's research and information network and MGI's analytics group were also pivotal in the production of this report. The authors would thus like to acknowledge the researchers who made significant contributions to the fact base: Soyoko Umeno, senior research analyst in global economics with MGI, and Akshat Harbola, a knowledge specialist in global economics with MGI. Finally, we are grateful for the vital input and support of leaders in McKinsey's High Tech Practice, especially Peter Bisson, a director in Stamford, Conn.; Lenny Mendonca, a director in Washington, DC; and Richard Dobbs, a director in Seoul.

In conclusion, we view this work as part of a critical research program to develop a deeper perspective on the transformational impact of the Internet on growth and prosperity around the world.

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In 2010...

1 billion Internet users in 30 aspiring countries—half of the global tally of Internet users

535 million users of online social networks in 30 aspiring countries, out of **957 million** users worldwide

310 million+ mobile devices used to access the Internet in 30 aspiring countries out of **800 million** worldwide

73% of Internet users don't use English as a first language

$135 billion estimated consumer surplus in 30 aspiring countries

143,000 Internet-related businesses started every year in 30 aspiring countries

1.9% average Internet contribution to GDP in 30 aspiring countries vs.

3.4% in developed countries

2.3% average Internet contribution to GDP growth in in aspiring countries over the past five years vs.

21% in developed countries, 2004–2009

1.9 million

jobs associated with the Internet in six aspiring countries

1.3%

of jobs in six aspiring countries associated with the Internet

3.2 jobs created

per job lost in the SMEs of eight aspiring countries vs.

1.6 jobs

in developed country SMEs

Executive summary

The Internet today connects about two billion people worldwide. Half of these are living outside the advanced economies, often in countries some that are quickly climbing the developmental ladder, with diverse populations and inarguable economic potentialities; countries as varied as Algeria, South Africa, China, Iran and Mexico. One indicator of development is Internet adoption. The pace at which countries outside of the advanced economies are adopting the Internet is much faster than that of advanced economies, yet 64 percent of the population in these countries remain unconnected. Research by us and others has highlighted the power of the Internet to contribute to economic growth and prosperity, and provide individuals, entrepreneurs, enterprises, and even governments with new ways to connect, consume and deliver products, services and content.

Few studies have focused on the impact of the Internet and the opportunity it offers in the developing world. The bulk of the research, including our own, has thus far looked at developed countries and focused primarily on the quantitative impact of the Internet on GDP. In this report, we take a different tack, choosing to examine more populous and faster-growing parts of the world where the Internet offers even greater potential. We look beyond the impact of the Internet on GDP: we measure its broader impact in terms of consumer surplus and the development of Internet ecosystems. We also look at how different participants have benefited from the Internet already, specifically measuring country environments for e-commerce and entrepreneurship, and analyzing in detail the impact of the Internet on small and medium-sized enterprises (SMEs). Finally, we try to assess the potential for future impact of the Internet on these countries.

We have defined 30 countries as "aspiring": i.e., those with the economic size and dynamism to be significant players on the global stage in the near future and achieve levels of prosperity approaching those of the advanced economies. Together, these 30 countries represent 30 percent of global GDP. We have studied nine of these in particular detail: Argentina, Hungary, Malaysia, Mexico, Morocco, Nigeria, Taiwan, Turkey, and Vietnam. The combined GDP of this group constitutes one-fifth of the GDP of our set of 30 aspiring countries. We chose not to study India or China, the two largest aspiring countries, as we have covered them previously in other reports.[1]

While the aspiring countries vary in terms of the nature and development of their Internet ecosystems, as well as the nature of opportunities and challenges they face, it was overwhelmingly clear that the potential for the Internet to transform these economies is quite significant. Each country we studied offered its own unique insights in terms of impact to date, opportunities, and challenges in a way that makes the country case studies interesting in their own right. However, in summary the report makes seven key findings:

1. **The Internet is growing at a tremendous rate in aspiring countries, but with distinctly different growth paths.** Internet penetration has grown at 25 percent per year for the past five years in the 30 aspiring countries, compared with 5 percent per year in developed countries. This phenomenal rate is possible because of previously low penetration: while average Internet penetration in most developed countries is above 70 percent, it is half that for most aspiring countries. The path that the growth is taking is different from that seen in the developed world. In aspiring countries it is partly the outcome of the high rates of adoption of mobile phones. Mobile subscriptions in these countries have increased from 53 percent of worldwide mobile subscriptions in 2005 to 73 percent in 2010. Many Internet users in aspiring countries are gaining access to the Internet solely through mobile phones, using mobile technology creatively to address local constraints.

1 McKinsey Global Institute, *Internet matters: The Net's sweeping impact on growth, jobs, and prosperity,* May 2011; *McKinsey Quarterly,* "China's Internet obsession," March 2010; *McKinsey Quarterly,* "Can India lead the mobile–Internet revolution?", February 2011.

2. **The impact of the Internet in aspiring countries has been significant, but there is tremendous potential impact if these countries reach developed world levels of access and usage.** The Internet contributes an average 1.9 percent of GDP in aspiring countries—$366 billion in 2010. By comparison, the Internet in developed countries contributes an average 3.4 percent of GDP. The great potential for Internet growth in the aspiring countries can be seen in our nine focus countries. There the Internet has accounted for anywhere between 1 and 13 percent of GDP growth over the past five years—adding an estimated total of $28 billion incremental GDP. The average contribution to growth in aspiring countries of 2.8 percent is much lower than that of developed countries, where the Internet has contributed an average of 21 percent to GDP growth between 2004 and 2009. A great deal of scope for growth in the aspiring countries is also present in Internet impact on consumer surplus. Today, measurable consumer surplus is between $9 and $26 per user per month in the nine aspiring countries, much lower than the $18 to $28 per user per month we have seen in developed economies. However, as a share of the Internet's contribution to GDP, it is higher than in advanced economies.

3. **Individuals in aspiring countries have utilized the Internet in significant and dynamic ways.** Individuals have often been the first to benefit from the Internet in aspiring countries, mostly through free services such as e-mail, social networks, search engines, and access to information, educational, entertainment, and other content. The younger half of the population drives the adoption of online services, and the level of their engagement with certain online activities, such as social networking, often exceeds that of their developed country counterparts. As a result, individuals in these countries, when connected, have experienced greater change in access to content and services compared to their developed world counterparts. As already mentioned, the measurable consumer surplus has been significant. Social (non-economic) benefits of the Internet are also significant and can have an impact on the well-being of large numbers of people. These include individual benefits, such as the ability of individuals to access education and health information and join civic associations, as well as benefits to larger communities, such as the ability to coordinate disaster relief.

4. **Entrepreneurs in aspiring countries have thrived despite Internet ecosystem constraints.** Entrepreneurs in aspiring countries have been able to create many new businesses, many accessing customers and suppliers beyond their cities and countries. Many of these entrepreneurs have had to innovate, creating new business models that enable users to overcome local constraints, such as offering payment for online purchases upon physical delivery or using mobile accounts instead of credit cards. Occasionally, there have been entrepreneurs from aspiring countries who have ended up disrupting established models in the advanced economies. It's also important to note that many of these entrepreneurs are often effectively social entrepreneurs, as they are helping to build a robust Internet ecosystem that allows individuals, enterprises, and governments to play a broader and deeper role in the economy and society.

5. **There is tremendous potential for enterprises to leverage and gain benefits from the Internet—much more than they do today.** Large enterprises were the first to adopt broadband and now are leading the way in adopting more advanced Web technologies. They are as a result increasing revenue and lowering costs. Multinationals can also apply Web-based solutions learned in one market to operations in other countries. While in many aspiring countries they are constrained by distinct local conditions, those multinationals that have succeeded have reaped significant benefits from better resource management to increased efficiency among their employees. SMEs have not yet leveraged information and communication technologies (ICT) and Web technologies as much as large enterprises. SMEs continue to have lower broadband penetration and make limited use of electronic messaging and online marketing. The adoption of Web technologies by SMEs may propel economic growth in the aspiring world. Where they do deploy ICT and Web technologies, SMEs have found increased revenue, lower costs, higher productivity, and net job creation. Those SMEs that are investing in Web technologies such as e-mail, Web sites, cloud computing, and e-business solutions are also the ones growing the fastest. SMEs that spend more than 30 percent of their budget on Web technologies grow their revenue nine times as fast as SMEs spending less than 10 percent.

6. **Governments and the public sector are starting to offer better and more accessible public services through the Internet, but still have opportunity to go further.** E-government services are still nascent in aspiring countries. They have nonetheless already often allowed governments to improve delivery of services such as health care and education. As aspiring country governments invest

more in e-government services, they are likely to step up from one-way information dissemination to highly efficient two-way transactional modes with their citizens. Aspiring country governments have also often played an active role in driving Internet access and use, from investing in infrastructure in rural areas to creating innovation clusters with a focus on Internet-driven growth.

7. **Aspiring countries can leverage their distinct characteristics to drive the development of Internet ecosystems.** Each aspiring country has very different macroeconomic profiles, (e.g., the role that trade already plays in the economy varies). Each element of strength can be leveraged to fully capture the power of the Internet to drive growth and prosperity. How each country chooses to leverage these characteristics will likely lead to different and distinct paths to fully capitalize on the Internet's potential and growth.

In addition to the summary findings above, it is worth noting a few broader themes as follows: Our research shows that across all countries it is generally individuals and small entrepreneurs that have experienced the greatest impact from the Internet. What these user groups can now do in terms of access, reach, and interaction has expanded significantly. The diversity of languages, cultures and human experiences that these individuals and entrepreneurs represent also dramatically expands the richness of the Internet in terms of its products, services, and content, as well as the range of creativity, entrepreneurship, and innovation that are displayed.

In economic terms, the Internet creates the potential for these countries to leapfrog certain steps of development and facilitate faster entry and participation in the global economy. However, for the Internet ecosystems of aspiring countries to mature, these countries need to ensure that several foundational elements are in place. Chief among these are a robust infrastructure, easy and inexpensive access to the Internet, robust commerce platforms, and industry structures that are open to competition so that users have access to rich and compelling products and services.

Lastly, it is important to note that with the growth of the Internet anywhere—whether in the developed or developing world—comes greater threats and possibilities for misuse. There are large and growing concerns regarding piracy, cybercrime, cyberterrorism and privacy. These are very real concerns that require concerted and coordinated action. However, it is our view that the power of the Internet to drive growth and prosperity far outweighs the risks and concerns, and so these concerns should not be an excuse to limit the growth and use of the Internet. The opportunities for individuals, entrepreneurs, enterprises, and government and policy makers are tremendous, as the details in this report suggest.

1. The Internet is growing at a tremendous rate in aspiring countries, but with distinctly different growth paths

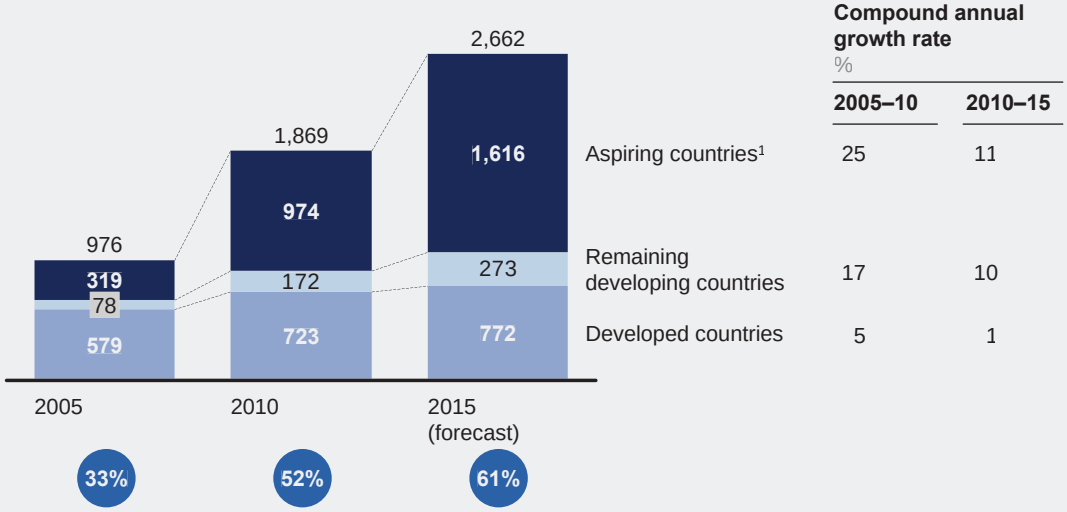
The Internet's presence in aspiring countries is significant. Even more noteworthy is the tremendous pace of its growth. From 2005 to 2010, the number of Internet users in aspiring countries has grown at about 25 percent per year (from 319 million users to 974 million users), approximately five times the growth rate of developed countries. The share of Internet users in aspiring countries has consequently increased from 33 percent in 2005 to 52 percent in 2010 and is forecast to further increase to 61 percent by 2015.[2] Looking forward, Internet use in aspiring countries is expected to grow at a rate of 11 percent per year, over ten times as fast as in developed countries (Exhibit E1).

2 Economist Intelligence Unit World data, Internet users, 2011.

Exhibit E1

More than half of current Internet users are in aspiring countries and their number is growing at ~five times the rate in developed countries

Estimated Internet users
Million users



	Compound annual growth rate % 2005–10	2010–15
Aspiring countries[1]	25	11
Remaining developing countries	17	10
Developed countries	5	1

1 Includes Algeria, Argentina, Brazil, Chile, China, Colombia, Czech Republic, Hungary, India, Indonesia, Kazakhstan, Malaysia, Mexico, Nigeria, Pakistan, Poland, Romania, Saudi Arabia, South Africa, Taiwan, Thailand, Turkey, Ukraine, Vietnam. Data unavailable for Morocco from this source.

SOURCE: Economist Intelligence Unit (EIU) World Data; McKinsey analysis

Having cost-effective and high-quality Internet access is crucial to spreading the technology in aspiring countries. An expanding Internet infrastructure has allowed the dramatic rise of Internet use in aspiring countries, often with lower connectivity costs. Advances in PC and mobile phone technologies have led to better performance at much lower cost. Millions of people are today accessing the Internet through simple feature phones.

In the evolution of their Internet ecosystems, the aspiring countries we studied have some shared experiences as well as some very distinct differences. Similarities have included the importance of infrastructure and digital literacy as building blocks. E-commerce has also thrived, although only where certain preconditions have been met, including the security of paying online and the degree of trust in parcel delivery. Differences have often arisen in the way countries have circumvented such barriers. Some countries have overcome constraints related to the security of online payments through increased legal protections; others have found alternatives to credit card payment such as online payments tied to mobile phone billing. Another example of such differences is in parcel delivery systems. Private-sector players have often stepped in to provide reliable parcel delivery. In addition, entrepreneurs have often found creative ways to circumvent parcel delivery issues such as shipping to local grocery stores that can hold products for pick up. It is clear that while cost and access constraints have limited Internet penetration and the engagement of users in all countries, individuals have often found new and innovative ways to leverage the Internet for their economic and social benefit.

High-quality Internet access was once prohibitively expensive for many users in aspiring countries, as the fixed and variable costs associated with fixed-line broadband was usually passed on to individuals. The rise, and near ubiquity, of mobile Internet has circumvented this problem. Mobile phones are less expensive than laptops, and rural areas are now made accessible without prohibitive capital outlays on cable. Mobile device subscriptions have grown at significantly higher rates in the aspiring world. Between 2000 to 2010, the annual growth of mobile subscriptions was 7 percent in the United Kingdom and 9 percent in the United States. Over the same period, Argentine mobile subscriptions grew at 22 percent per year and Malaysian mobile subscriptions at 19 percent per year. The difference is even more dramatic when we look at countries that have more serious infrastructure challenges. Mobile subscriptions in Vietnam grew at an annual rate of 67 percent and in Nigeria at 109 percent over this period.[3] While only 25 percent of Internet users in developed countries such as the United States and United Kingdom gain Web access principally through mobile phones, in aspiring countries that share is often much higher: in Egypt it is 70 percent; in India, 59 percent; and in Nigeria 50 percent.[4] These users are urban as well as rural, and are often young people.

In summary, the state of the Internet at the time of writing varies significantly across different aspiring countries and also when compared with the advanced economies. (See Exhibits E2 and E3 for a summary of the landscape of Internet usage, impact, and ecosystem health across the aspiring countries on which we focus, with a set of developed countries included for comparative purposes.)

Internet users in aspiring countries have adopted certain online activities more quickly than their counterparts in developed countries. The popularity of social networking is one example. Globally, Internet users spend 17 percent of their online time on social networks.[5] But aspiring country users often use social networking at much higher levels. Mexican users spend 30 percent of their time online and Malaysian users 33 percent engaged in social networks.[6] Social networking for the purposes of communication partly drives this behavior, as social networks offer an inexpensive alternative to telephone communication within and between countries. The economics for the individual has driven the popularity of Internet-based alternatives to more expensive traditional communication. Skype, for example, is already the world's largest international voice carrier.[7]

It is only a matter of time before aspiring countries develop a much richer and more textured global Internet ecosystem. While English is still the primary language of the Internet, the languages of aspiring countries are the fastest-growing on the Internet—73 percent of users Internet users do not speak English as a first language. From 2000 to 2011, while the English-speaking Internet user base was growing by 301 percent, Arabic-speaking Internet users were growing by 2,501 percent, and Chinese-speaking users were growing by 1,479 percent (Exhibit E4).[8]

3 Economist Intelligence Unit World data, Internet users, 2011.
4 On Device Research, "The 'Mobile Only' Internet Generation," December 2010.
5 ComScore, "The network effect: Facebook, LinkedIn, Twitter & Tumblr reach new heights in May," June 2011.
6 ComScore, "Social networking accounts for one-third of all time spent online in Malaysia," October 2011.
7 Mikael Ricknäs, "Skype is largest international voice carrier, says study," IDG News Service, March 25, 2009.
8 Internet World Stats, "Top ten languages used in the Web," http://www.internetworldstats.com/stats7.htm (accessed December 1, 2011).

Exhibit E2

Internet landscape and impact statistics

Top quartile | Second quartile | Third quartile | Bottom quartile

	Internet users Million	Internet penetration % of population	Fixed broadband subscribers % of population	Mobile broadband subscriptions % of population	Median monthly cost of 1 Mbps $ PPP	Online retail share of retail %	Internet contribution to GDP[1] % of GDP	Internet contribution to GDP growth[1] % of GDP growth
Argentina*	26	64	10	13	16	1.1	2.2	2.7
Brazil	79	41	7	11	17	3.1	1.4	2.4
Canada	28	81	30	15	5	0.9	2.7	10.2
China	486	36	9	2	11	1.1	2.6	3.4
France	50	78	33	36	8	3.8	3.2	17.6
Germany	67	82	32	36	4	3.8	3.2	24.3
Hungary*	7	68	20	30	3	1.1	3.9	11.4
India	98	8	1	1	59	0.3	3.2	5.2
Italy	33	54	22	59	7	0.9	1.7	12.2
Japan	101	79	27	88	–	3.2	4.0	–
Malaysia*	16	55	7	27	50	4.4	4.1	2.3
Mexico*	39	34	10	8	22	0.5	1.0	2.2
Morocco*	16	49	2	10	–	0.5	0.9	1.2
Nigeria*	52	33	<1	3	–	0.1	0.5	0.9
Russia	61	43	11	17	5	2.1	0.8	0.9
South Korea	40	83	36	91	-	12.3	4.6	16.0
Sweden	8	90	32	84	3	3.8	6.3	32.9
Taiwan*	16	72	23	–	–	3.0	5.4	12.7
Turkey*	36	49	10	18	9	0.8	0.9	1.5
United Kingdom	53	85	31	56	4	7.7	5.4	22.7
United States	250	81	27	54	5	4.0	3.8	14.9
Vietnam*	27	31	4	13	41	–	0.9	1.6

* Focus aspiring countries

1 Internet contribution to GDP calculated in 2010 for Argentina, Hungary, Malaysia, Mexico, Morocco, Nigeria, Taiwan, Turkey, Vietnam and in 2009 for all other countries. Internet contribution to GDP growth is calculated from 2005 to 2010 for Argentina, Hungary, Malaysia, Mexico, Morocco, Nigeria, Taiwan, Turkey, Vietnam, and from 2004 to 2009 for all other countries.

SOURCE: Internet World Statistics, 2010; Hungarian Central Statistical Office 2010; Economist Intelligence Unit Telecoms and Technology Report data for 2010, published in 2011; Morocco, Agence Nationale de Reglementation des Telecommunications, 2010; Malaysia Communications and Multimedia Commission data for 2010, published in 2011; ICT Vietnam Whitebook data for 2010, published 2011; International Telecommunication Union, World Telecommunication/ICT Development Report and database, 2010; World Bank population data, 2010; Cost of 1 mbps from Speedtest.net pulled in November 2011, PPP adjustment to US dollar using World Bank 2010 conversion rate; Euromonitor International, 2010; McKinsey analysis

Exhibit E3

Internet foundations statistics

Scale to 100

Top quartile | Second quartile | Third quartile | Bottom quartile

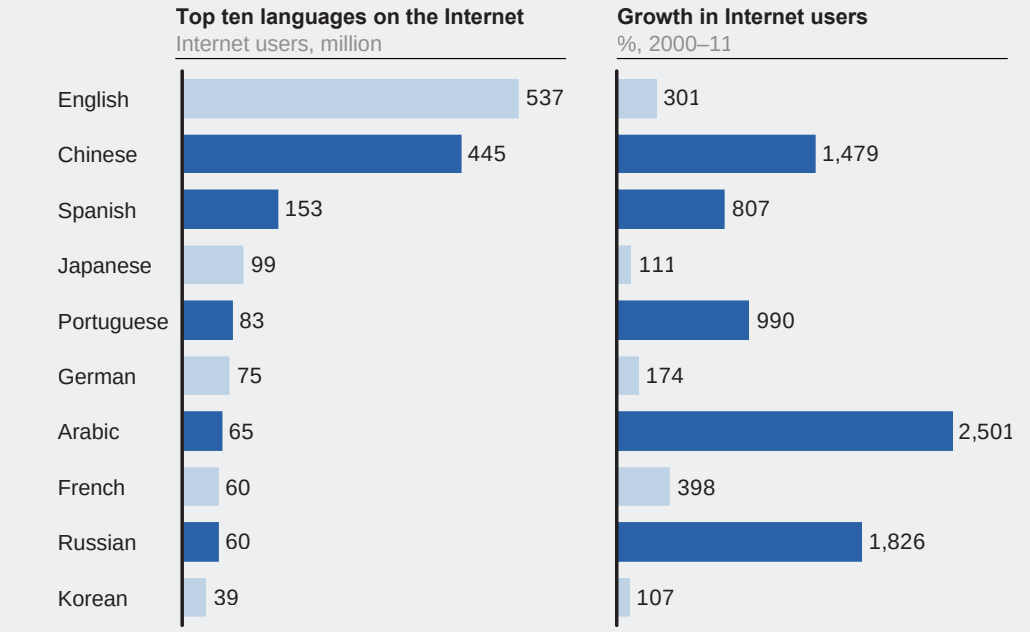
	Human capital	Base infra-structure	Internet infra-structure	Internet access-ibility	Ease of Internet entrepre-neurship	E-commerce enable-ment	Financial capital	Business environ-ment	Global connected-ness
Argentina*	17	22	32	24	21	30	5	32	37
Brazil	25	39	30	31	29	44	16	34	37
Canada	31	60	79	78	84	78	30	80	52
China	69	46	27	19	35	34	23	55	31
France	35	60	70	71	71	70	30	72	54
Germany	36	60	75	80	59	71	21	80	59
Hungary*	22	42	57	58	64	51	10	46	46
India	25	26	11	10	25	28	24	45	29
Italy	20	36	47	57	45	50	12	51	44
Japan	42	60	69	61	54	67	19	80	35
Malaysia*	25	57	40	25	40	44	27	65	68
Mexico*	16	29	23	35	33	36	10	40	43
Morocco*	23	37	17	35	39	25	19	41	47
Nigeria*	13	9	4	44	36	20	11	36	37
Russia	57	31	27	41	42	34	16	32	41
South Korea	43	60	76	56	57	64	19	61	38
Sweden	35	60	91	87	71	75	37	89	60
Taiwan*	35	60	66	67	71	67	43	71	65
Turkey*	19	43	42	24	43	35	13	47	40
United Kingdom	37	60	87	88	78	80	27	79	65
United States	85	60	76	80	76	81	81	79	53
Vietnam*	40	32	24	11	30	21	16	43	39

* Focus aspiring countries

SOURCE: World Economic Forum, Global Information Technology Report 2010-2011; Computer Industry Almanac; Pyramid Research; United Nations Conference on Trade and Development, Information Economy Report 2010; World Digital Media Trends; Euromonitor; International Data Corporation; World Bank; World Economic Forum, Global Competitiveness Report 2010-2011; IMD World Competitiveness Online; Capital IQ; UNESCO; ITU World Telecommunication; International Finance Corporation; Speedtest.net; Transparency International; Economic Intelligence Unit; postal operator websites; Telegeography; International Monetary Fund; FDI markets; Economist Intelligence Unit; Global Insight; CIA Factbook; CEPII; Ethnologue: Languages of the World; McKinsey analysis

Exhibit E4

While English remains the primary language for Internet users, growth is in aspiring country languages



SOURCE: Internet World Stats

2. The impact of the Internet in aspiring countries has been significant, but there is still tremendous potential if these countries reach developed world levels

The economic and social impact of the Internet on individuals and communities has already been significant, though low compared to the advanced economies. We have measured the impact of the Internet on GDP and consumer surplus, two elements that constitute only a part of its total impact. The richness of the Internet and its far-ranging social impact on individuals online and offline is difficult to quantify, but we have tried to give a sense of the breadth of that impact through illustrative examples. In our analysis of the SME sector, we have also assessed Internet-related job creation and productivity gains. We made conservative ingoing assumptions in this area, not taking into account, for example, the wider benefits to society through increased transparency, or benefits to the economy from a more diversified base of economic activity. We therefore believe that our sizing of the total impact of the Internet is likely to be understated.

In 2010, we estimate that the total contribution of the Internet to GDP in all aspiring countries was $366 billion.[9] Of this, $66 billion came from our nine focus aspiring countries, $243 billion from the BRICs (Brazil, Russia, India, and China), and $57 billion from the remaining aspiring countries (Exhibit E5). If we consider that the Internet contributes an average of 1.9 percent to the GDP of all aspiring countries compared with 3.4 percent in developed countries, it becomes apparent that the Internet has a great deal of room to bolster further economic growth in aspiring countries. In absolute terms, this potential is even more striking. The economic value generated annually by the Internet is $119 per capita in aspiring countries compared with $1,488 per capita in developed countries.[10]

9 Internet contribution to GDP is calculated in detail for the nine focus countries and BRIC countries and is estimated for the remaining aspiring countries using best available data.

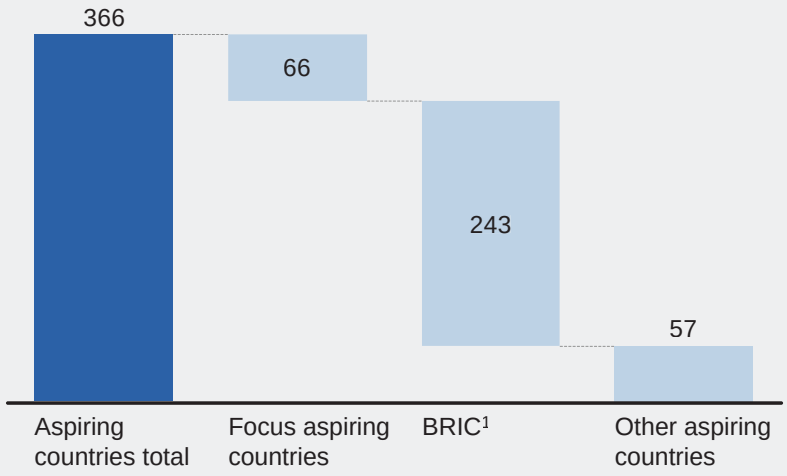
10 Developed countries estimated by aggregating Canada, France, Germany, Italy, Japan, South Korea, Sweden, the United Kingdom, and the United States.

Exhibit E5

The Internet contributed $366 billion to aspiring countries' economies in 2010—1.9 percent of a total GDP of $19.3 trillion

Internet contribution to GDP, aspiring countries

$ billion, 2010



1 For the Internet contribution to GDP in Brazil, Russia, India, and China, see McKinsey Global Institute, *Internet matters: The Net's sweeping impact on growth, jobs, and prosperity*, May 2011.

SOURCE: Gartner; Global Insight; Organisation for Economic Co-operation and Development (OECD); ITU; International Data Corporation (IDC); World Health Organization (WHO); ICD; iConsumer US 2010; Euromonitor; H2 Gambling Capital; PhoCusWright; Pyramid Research; UN Educational, Scientific and Cultural Program (UNESCO); McKinsey analysis

This economic impact varies widely even among countries at a similar stage of development. Among the nine aspiring countries on which we focused, the Internet contributed between 0.5 and 5.4 percent of GDP. Among developed countries, the Internet contribution to GDP ranged from 1.7 to 6.3 percent. The scope for potential impact in aspiring countries is clear, and robust Internet ecosystems could unlock much more value (see Box E1, "Common factors need to be addressed to build a robust Internet ecosystem").

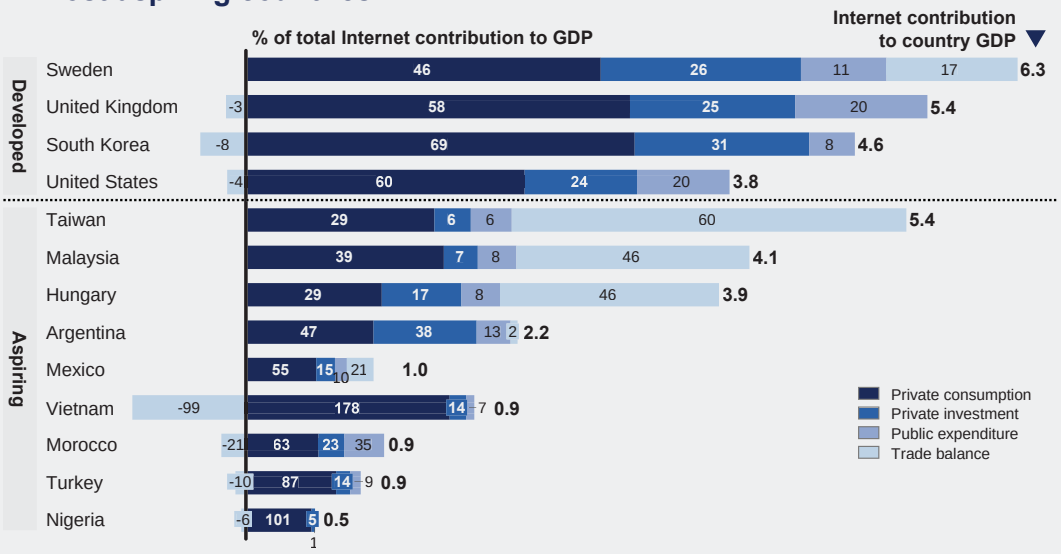
A related difference between developed and aspiring countries is in the composition of the Internet's GDP contribution. GDP, the value of all goods and services produced in an economy, can be measured as the sum of investment by the public sector (e.g., government, nongovernmental organizations); investment by the private sector (e.g., enterprises); consumption of goods and services; and export of goods and services, minus imports of the same. We have measured the Internet-related proportion of each category that contributes to GDP, thereby providing a total contribution of the Internet to GDP. For most aspiring countries, Internet-related consumption forms the vast majority of the contribution to GDP (Exhibit E6). Individuals are the first to benefit from the Internet through their engagement in social media, communication, gaming, and consumption-focused activities. The Internet's enterprise benefits are more prevalent in the mature Internet ecosystems of the developed countries. Internet-related private investment therefore contributes less to GDP in aspiring countries (13 percent) than in developed countries (29 percent).

The total contribution of the Internet to GDP in some aspiring countries, notably Taiwan and Malaysia, is similar to those levels observed in developed countries. While consumption is high, these aspiring countries benefit from being net exporters of ICT goods and services. In fact, the most notable difference between the contribution of the Internet to GDP in aspiring countries compared to developed countries is how the trade balance can take precedence over other contributing factors. On average in aspiring countries, 32 percent of the contribution of the Internet to GDP is due to net exports of ICT-related goods, compared with 3 percent for developed countries.[11]

11 McKinsey Global Institute, *Internet matters: The Net's sweeping impact on growth, jobs, and prosperity,* May 2011.

Exhibit E6

Private consumption forms the bulk of the Internet's contribution to GDP in most aspiring countries



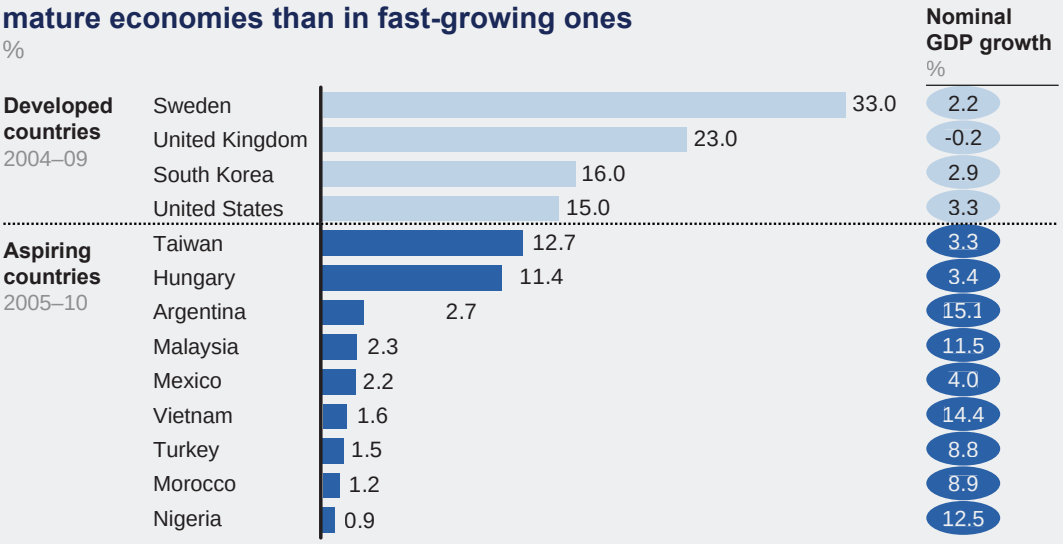
SOURCE: Gartner; Global Insight; OECD; ITU; IDC; WHO; ICD; iConsumer US 2010; Euromonitor; H2 Gambling Capital; PhoCusWright; Pyramid Research; UNESCO; McKinsey analysis

From 2005 to 2010, the Internet accounted for 2.8 percent of the combined GDP growth of the nine aspiring countries on which we focus.[12] The Internet accounted for 21 percent combined GDP growth in the developed countries studied (Exhibit E7).[13] While this difference can be partly explained by high growth in aspiring countries that makes the contribution seem proportionally smaller, it also points to the very large untapped potential of nascent Internet ecosystems for swift growth.

Exhibit E7

The Internet's contribution to GDP growth is higher in mature economies than in fast-growing ones

%



NOTE: For consistency across countries, where possible GDP growth figures are based on the World Bank's World Development Indicators: US dollars at current prices. Estimates from other sources may differ.

SOURCE: McKinsey Global Institute, Internet matters: The Net's sweeping impact on growth, jobs, and prosperity, May 2011; Gartner; Global Insight; OECD; ITU; IDC; WHO; ICD; iConsumer US 2010; Euromonitor; H2 Gambling Capital; PhoCusWright; Pyramid Research; UNESCO; McKinsey analysis

12 Internet contribution to GDP growth is defined as the increase in Internet contribution to GDP, divided by the overall GDP growth in the same time period.

13 As assessed in McKinsey Global Institute's *Internet matters* report, using the same methodology as in this report, but from 2004 to 2009.

While expenditure on Internet-related goods and services is easily measurable and incorporated in calculations of the Internet's contribution to GDP, consumer utility is more difficult to assess. Extrapolating from survey-based data on the value of free Internet services—from e-mail to browsing to information services and search, net of annoyances like spam and excessive advertising—we have estimated the consumer surplus for aspiring countries. We found that consumer surplus is significant, ranging from $9 per month per Internet user in Nigeria to $26 per month per Internet user in Taiwan. Consumer surplus per user in most aspiring countries is significantly lower than that of developed countries, where it ranges from $18 to $28 per user per month.

Consumer surplus, as a share of Internet contribution to GDP, is higher in aspiring countries than it is in developed ones. This is in line with our broader findings that individuals are the first to benefit from the Internet in aspiring countries. We believe that there is significant room for growth here. We found that the total consumer surplus would increase from $135 billion to $364 billion per year in aspiring countries if Internet penetration reached the levels in developed countries. This is a conservative number, as we have not quantified all categories of consumer use. Our consumer surplus estimates cover the broad categories of communication, entertainment, and services.[14] Our estimates are not exhaustive, however; for instance, we leave out some categories such as "document sharing" made newly popular by start-ups such as Dropbox. Furthermore, we do not account for the offline benefits of having a robust Internet ecosystem, such as the ability to research products online even if they are purchased offline.

Beyond the Internet's economic impact, users gain significant social utility from the Internet. The Internet has allowed individuals to participate in social issues of their concern, as well as connect with like-minded communities and civic groups. Users can leverage the Internet to stay informed on matters of civic interest and communal and individual well-being such as health, emergencies, and disaster relief. Aspiring countries are leveraging the Internet for social impact in diverse ways. Two typical examples are mPedigree, a public-private partnership that uses mobile networks and the cloud to tackle drug counterfeiting in sub-Saharan Africa and South Asia, and the Khan Academy, which provides free classes online throughout the world.

Box E1. Common factors need to be addressed to build a robust Internet ecosystem

The first step to a robust Internet ecosystem is quality infrastructure. Basic infrastructure, such as reliable electricity supply and roads to allow postal delivery, is a must, as well as quality fixed or mobile Internet infrastructure. Secure Internet servers and large international Internet bandwidth are necessary to fully capture the value from the Internet. A lack of secure servers can increasingly be circumvented with cloud solutions, depending upon the availability of reliable Internet supply. A wide range of technological options for this are available, including 3G, 4G, WiMax, satellite, cable, and dial-up.

Beyond infrastructure, a mature Internet ecosystem is defined by the intensity of Web use by all stakeholders, the main ones being individuals, businesses, and government. Getting more individuals online requires raising the level of digital literacy, cutting the cost of access to both devices and Internet connections, and developing quality offerings, including content in the national language. Businesses also derive considerable benefits from the Web but need to invest in Web technologies that drive productivity and allow companies to access new markets, customers, and suppliers. Such investments also involve employee training in Internet use and a healthy broadband infrastructure. Finally, governments need to invest in quality online services that will engage citizens and help them realize cost savings from increased efficiency.

If infrastructure is present and users are becoming engaged, the next step is leveraging the Internet for economic and social benefits. This includes promoting business-to-business (B2B) e-commerce to increase enterprise productivity and facilitate exchanges between businesses, and promoting business-to-consumer (B2C) e-commerce to benefit individuals. Entrepreneurs have often been critically important in unlocking the power of the Internet, but a common constraint has been access to capital for early-stage investments.

14 Consumer surplus is measured across communication (e-mail, instant messaging, telephony, social); entertainment (games, music, video, WebTV); and services (P2P, search, comparison, mapping, directories, yellow pages, blogs, wikis, advertising, privacy).

3. Individuals in aspiring countries have utilized the Internet in significant and dynamic ways

For individuals in the aspiring world, adoption of Web technologies has grown and continues to grow rapidly. The high rate of adoption has been driven by the utility that individuals derive from the Internet, including a host of benefits from search to shopping, and from media consumption to access to information.

Some are direct and highly visible benefits such as consumer surplus from e-commerce, which provides access to wider variety of goods and services that would otherwise not be available. E-commerce in aspiring countries grew significantly from 2005 to 2010 and is projected to continue expanding.[15] E-commerce not only provides consumers choice in purchasing goods and services, but also increases competition that leads to more competitive pricing and price transparency in both online and offline retail outlets. Online research, furthermore, allows consumers who prefer to purchase offline to make more educated purchasing decisions.

Individual benefits extend well beyond consumer surplus. Users can gain access to a wide range of research tools in areas like education and health, and participate in activities online from filing taxes to identifying the best available crop prices in real time. Similarly, the Internet promotes community by helping online individuals find other people with similar interests and hobbies.

The benefits of the Internet accrue to both Internet users and non-users. The Internet enhances transparency in the political sphere, for example, through publication of campaign contributors, or in the commercial sphere by enabling price comparisons. Those not online can still benefit from enhanced transparency. Farmers who are not online, for example, can benefit from more competitive pricing for the goods they purchase and sell if other farmers have drawn in more customers or reduced the role of intermediaries. This happened in Ghana when the innovative service Esoko began collecting and distributing agricultural market data in a system that is now used across much of Africa.

Much of the online engagement in aspiring countries is by young users. Web technology users in aspiring countries are younger on average than those in developed countries (Exhibit E8). In Turkey the median age of Internet users is 28, while in Europe it is 44.[16] Web-related technologies are most popular with young users. In aspiring countries they drive adoption of free or low-cost technologies and activities such as social networking or VoIP (voice-over Internet protocol). They are also the first users of higher-cost Web technologies such as smartphones, which they use in greater numbers than do their counterparts in developed countries.

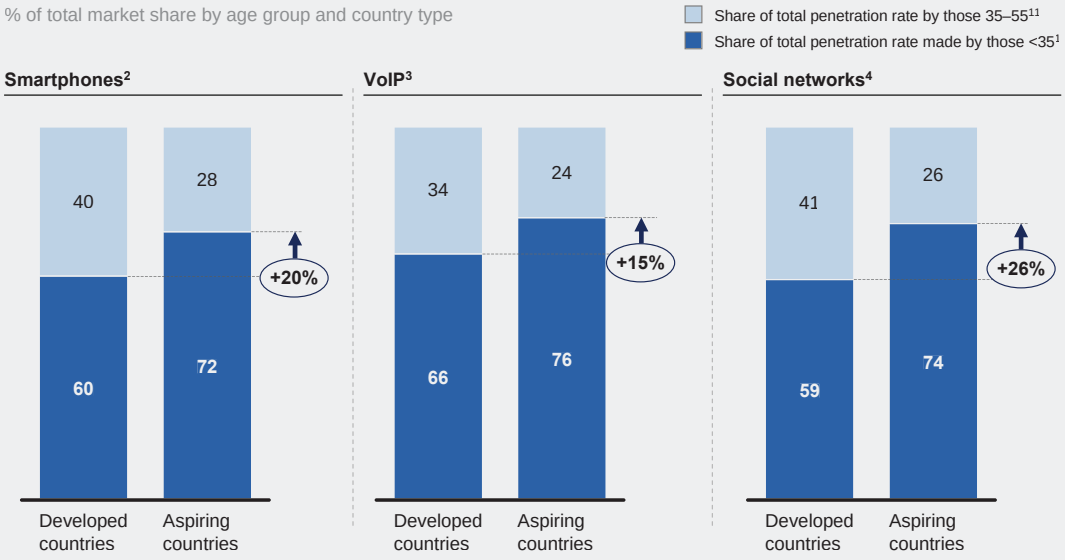
15 Euromonitor.

16 United Nations, "World Population Prospects: The 2010 Revision," 2010.

Exhibit E8

Consumers aged under 35 represent a greater share of the smartphone, VoIP, and social network markets in aspiring countries

% of total market share by age group and country type



1 Analysis and illustration exclude consumers over 55 due to inconsistent data.
2 Aspiring countries include: Brazil, China, Poland, and Russia. Developed countries include: France, Germany, Italy, Netherlands, Spain, United Kingdom and United States.
3 In addition to countries included in footnote above, additional aspiring countries include India and Malaysia.
4 Same set of countries as those listed in footnote 3. Social network penetration based on consumers using social networks at least once a week.

SOURCE: 2011 McKinsey iConsumer Survey (~28,000 survey respondents across aspiring countries and ~53,000 survey respondents across developed countries. Only urban responses collected in India, China, and Malaysia)

4. Entrepreneurs in aspiring countries have thrived despite Internet ecosystem constraints

Entrepreneurs in aspiring countries have leveraged increases in Internet use and infrastructure improvements to create new business models. From successful implementations of popular Web applications in developed countries to new commerce and policy platforms, entrepreneurs have brought new services, expanded products, and deeper content within reach of users in aspiring countries. With about 150,000 Internet-related businesses started each year in aspiring countries, entrepreneurs have driven much of the growth of the Internet ecosystems in aspiring countries. They are building the foundations that consumers and enterprises can then take advantage of.

Entrepreneurship in aspiring countries has been encouraged by demand for localized solutions to local constraints or modification of successful Internet models from developed countries to the local market. Examples of this entrepreneurship include the design of new ways to pay online, like mobile payments tied to bank accounts. Similarly, innovation in parcel delivery has yielded new solutions such as those involving networks of local businesses in the delivery of products to end users. Start-ups have replicated successful business models created in developed countries while simultaneously adapting to unique local conditions. Trendyol, a Turkish Internet service with a business model similar to Gilt Groupe, very successfully leverages social networking for sales and marketing and has drawn a large number of followers on Facebook.[17] Many entrepreneurial ventures in aspiring countries also address broader social issues. For example, EpiSurveyor, a Web- and mobile phone-based data collection platform often used to collect public health data remotely, has played a critical role in tracking polio monitoring.

17 Y. M. Ousley, "Turkish flash sales site Trendyol raises $26 million," *Internet Retailer,* August 16, 2011.

Constraints still hamper the effectiveness of small actors in the Internet ecosystem. The level of digital literacy that is sufficient for young people using social networking and media sites is usually insufficient for enterprises using Web technologies. In aspiring countries there is a lack of awareness about more advanced enterprise Web technologies such as electronic customer relationship marketing (eCRM). Entrepreneurs must face the constraints cited by small enterprises as the most challenging: the cost of equipment and availability of the Internet. Inadequate venture capital environments also hold back entrepreneurs. Inward ICT foreign direct investment (FDI) tends to focus on large telecommunications projects or Internet businesses that have already achieved scale. In most aspiring countries the high cost of capital constrains entrepreneurial access to loans and early-stage investment. As a result, even entrepreneurs with promising growth often have difficulty scaling.

5. There is tremendous potential for enterprises to leverage and gain benefits from the Internet—much more than they do today

Large enterprises were early adopters of Web technologies in aspiring countries. Having gained an early competitive advantage, these enterprises then used the Internet to capture market share and gain profitability. Today, they continue to adopt new and sophisticated Web technologies that may still be out of reach for small enterprises that lack similar access to capital—technologies that also enable cost reductions by increasing productivity and decreasing administrative overhead.

Multinational corporations have additionally benefited by applying standardized Web-based solutions across the various aspiring countries in which they operate. However, specific local constraints make such strategies challenging. Multinationals able to overcome these challenges receive additional benefits ranging from increased resource management to improved employee efficiency.

Web technologies have also enabled some companies in the aspiring world to innovate and grow. Companies that were once start-ups in these economies have now risen to prominence by creating Internet-based solutions to constraints on everyday life in these countries. M-Pesa, an innovative service created by Safaricom and owned by Vodafone, originally allowed microfinance borrowers to receive and repay loans conveniently, using a network of mobile airtime resellers.[18] By promoting financial inclusion, the service has grown rapidly. M-Pesa now operates in South Africa and three other countries and accounts for 7 percent of Vodafone's total money transfer revenue.[19]

While SMEs in aspiring countries are largely under-leveraging the Internet, those that have leveraged its potential have attracted significant benefits, including accelerated growth, larger profits, and competitive advantage in the markets in which they compete.

SMEs that have embraced Web technology in the past three years have grown faster than those that have not. SMEs with larger investments in Web technologies have grown the fastest. Growth in SMEs correlates positively with a firm's investment in Web technologies, including online advertising, broadband, and mobile broadband. SMEs not currently invested in the Web but planning to invest within the next two years believe they can catch up with those already invested, while those with no plans to invest believe they will fall further behind (Exhibit E9).

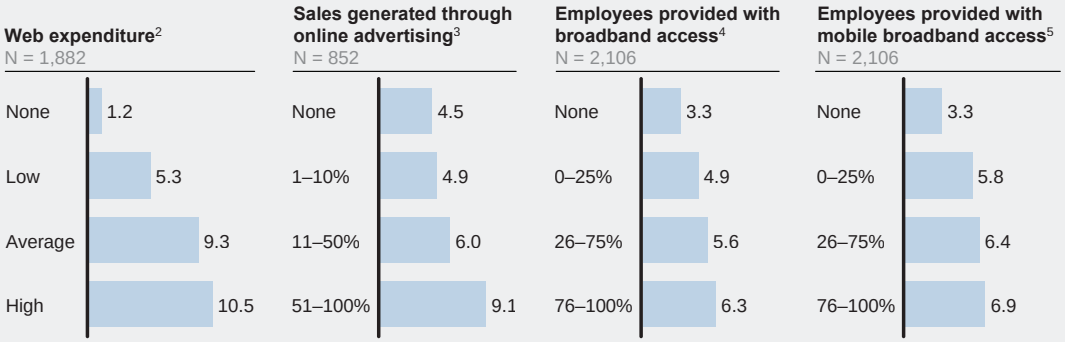
18 N. Hughes and S. Lonie, "M-Pesa: Mobile money for the "unbanked": Turning cellphones into 24-hour tellers in Kenya," *Innovations: Technology, Governance, Globalization,* Volume 2, Issue 1-2 (2007): 63–81.

19 Peter Gakure-Mwangi, "M-pesa earns Vodafone SH1.8 billion in 2010/2011 in [license] fees," Thinkm-pesa.com, August 15, 2011.

Exhibit E9

SMEs' high growth correlates positively with Web spending, online sales generation, broadband access, and mobile broadband access

SME stated growth, %[1]



1 Excludes all respondents who did not know their company's growth rate.
2 Low Web expenditure is less than 10% of total expenses. Average is 11–30% of total expenses. High is greater than 30% of total expenses. "What percentage of your expenses are digital, i.e., linked to Web technologies (electronic messaging, intranet, extranet, WiFi, Web sites, Web 2.0 tools, servers/routers, Web connection for employees, Enterprise Resources Planning (ERP), e-commerce, e-marketing, e-supply chain)?" Excludes "I don't know" responses.
3 "What percentage of your revenues are driven by ONLINE advertising? 2010 (projected)." Excludes "I don't know" responses.
4 "Do you have a broadband Internet connection available to your employees?" If so, "What percentage of your employees have access to it?"
5 "Do you have access to wireless Internet through a mobile broadband connection?" If so, "What percentage of your employees have access to it?"

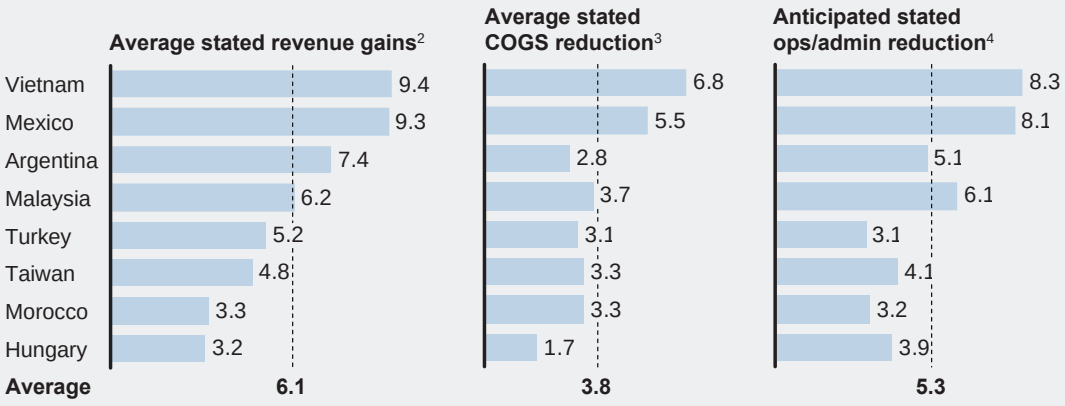
SOURCE: 2011 McKinsey survey of 2,484 SMEs across Argentina, Hungary, Malaysia, Mexico, Morocco, Taiwan, Turkey, and Vietnam; McKinsey analysis

SMEs in aspiring countries that use Web technologies have cited increased revenue, reduced cost of goods sold, and decreased administrative and operations costs (Exhibit E10).

Exhibit E10

Across eight aspiring countries, SMEs say the Internet has allowed them to gain revenue and reduce costs[1]

% (N = 2,484)



1 Nigerian SME sector not surveyed, due to lack of survey resources there
2 Percent of respondents answering "Yes" to "Current performance linked to the Internet: Have Web technologies made it possible for your company to increase your revenue (to an extent that could not have happened through other channels or technologies)?" multiplied by the average stated impact.
3 Percent of respondents answering "Yes" to "Current performance linked to the Internet: Have Web technologies made it possible for your company to reduce your cost of goods sold (COGS)?" multiplied by the average stated impact.
4 Percent of respondents answering "Yes" to "Current performance linked to the Internet: Have Web technologies made it possible for your company to reduce expenses related to administrative, operational and general costs (including marketing expenses)?" multiplied by the average stated impact.

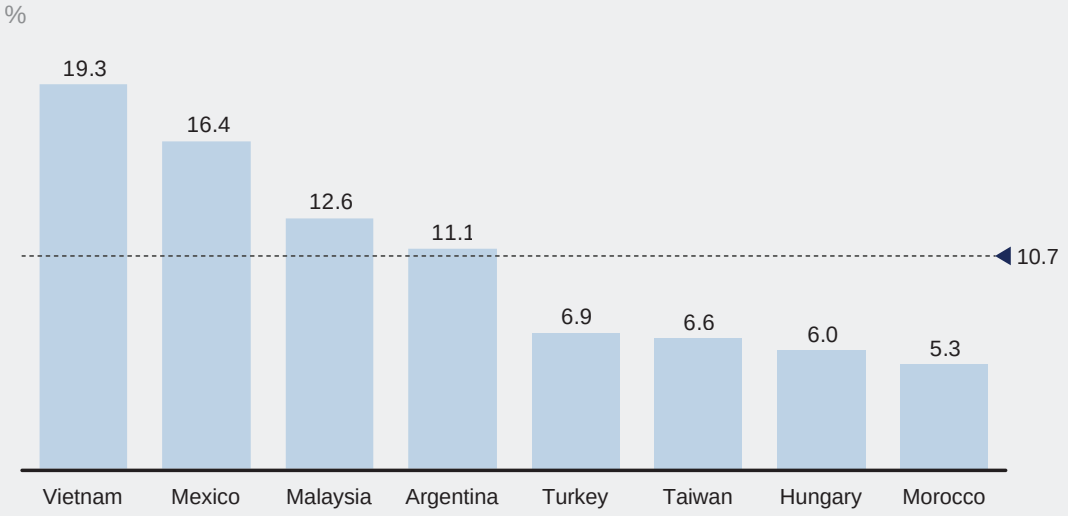
SOURCE: 2011 McKinsey survey of 2,484 SMEs across Argentina, Hungary, Malaysia, Mexico, Morocco, Taiwan, Turkey, and Vietnam; McKinsey analysis

Surveyed SMEs reported that Web technologies have enabled productivity increases of an average of 11 percent. Higher Internet-enabled productivity gains, furthermore, correlated to greater profitability gains (Exhibit E11).

Exhibit E11

McKinsey's SME survey found that productivity gains vary by country

Average stated productivity increase due to Web technologies



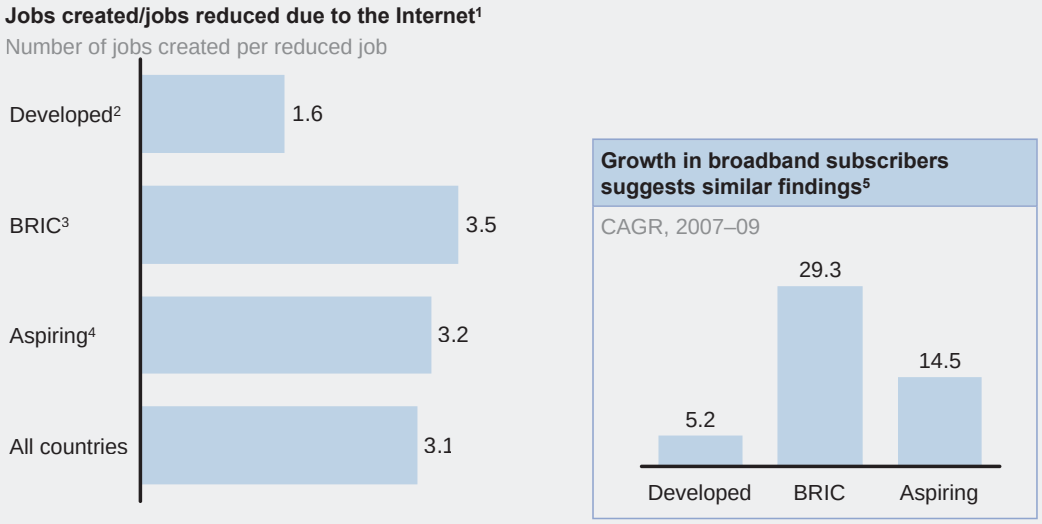
SOURCE: 2011 McKinsey survey of 2,484 SMEs across Argentina, Hungary, Malaysia, Mexico, Morocco, Taiwan, Turkey, and Vietnam; McKinsey analysis

Web technologies are correlated with competition and market leadership in aspiring-country SMEs. The greatest Internet investments and gains occur in the most competitive markets. Similarly, market leaders dedicate the most resources for Internet technologies and reap the most in productivity gains. By their actions, SMEs in competitive markets across aspiring countries are likewise seeking to capture growth and profitability gains by enhancing Web capacity. Surveyed SMEs providing the most employees with access to mobile broadband access were usually in the most competitive markets. Similarly, SMEs in more competitive markets found higher productivity gains from the Internet than those SMEs in less competitive environments.

The economic impact on the SME sector has been positive in terms of creating jobs, too. We have found that the Internet created 3.2 jobs for every 1.0 job it reduced in the aspiring world—more than the 1.6 jobs created for every job lost in developed countries. These figures also align with statistics on the growth of the Internet in these countries (Exhibit E12).

Exhibit E12

The Internet globally creates more SME jobs than it destroys, with the greatest impact in BRIC economies and aspiring countries



1 Respondents were asked: "What has been the net impact of the use of web technologies on your company's total number of employees?" Those answering "a reduction in the number of employees" or "the creation of jobs" were then asked, "Please estimate the creation/reduction in the number of employees relative to its level before (or without) your company's use of Web technologies."
2 Includes Canada, Germany, Italy, Japan, South Korea, Sweden, United Kingdom, United States.
3 Includes Russia, India, China. Data not available for Brazil.
4 Includes Argentina, Hungary, Malaysia, Mexico, Morocco, Taiwan, Turkey, Vietnam.
5 Based on broadband subscribers per 100 people.

SOURCE: 2011 McKinsey survey of ~7,000 SMEs; World Bank

6. Governments and the public sector are starting to offer better and more accessible public services through the Internet, but still have opportunity to go further

Governments influence Internet ecosystems in three ways: by enabling citizens' Internet accessibility and digital literacy; by setting the regulatory environment in which Internet ecosystems develop; and by providing e-government services. The governments of developed and aspiring alike focus on all three tasks using fairly similar methods, but a wide variance is observed in how and how completely each objective is met.

Governments can play a strong role in establishing widespread access to the Internet for their citizens. This can be done in two ways: first, governments can enable and/or build the infrastructure needed for mobile or broadband, and second, governments can provide devices that enable Internet access. The United Arab Emirates provides free WiFi in public locations such as airports, reducing the cost of devices as a hurdle to Internet access. Argentina, through Programa Conectar Igualdad, has already provided almost two million free laptops to schoolchildren, reducing a big cost hurdle. Similarly, Saudi Arabia's Home Computer program, a public-private initiative, is seeking to bring one million PCs to homes across the country.

Digital literacy is a key hurdle in many aspiring countries, but it is eroding naturally, as young people grow up with Internet devices and consumer applications such as social networking. The literacy constraint is more of a concern for SMEs, whose adoption of the Internet continues to lag. Some programs, such as Hungary's Digital Renewal Action Plan, focus on spreading digital literacy. In Hungary's case, the target is 100,000 citizens in rural areas, where individual and business Internet use lags the most.

Box E2. Aspiring countries face obstacles to enhancing the impact of the Internet

The outlook for the Internet in aspiring countries is ripe with opportunity, but potential obstacles are also present, including inadequate Internet access, digital literacy, and regulatory and other policies.

Cost-effective Internet access is often beyond the reach of large segments of the population. Delivery of access at low cost is critically dependent on a robust mobile and/or fixed-line Internet infrastructure and affordable device and connection costs. Even with these advantages in place some potential users in aspiring countries will not have the income necessary to access the Internet.

Facility in a language with significant content presence on the Web is an important hurdle for leveraging the Internet. Education matters—a lack of basic literacy inhibits even the use of free services such as online video that do not explicitly involve reading or writing. Digital literacy is an important second-order concern, as even many highly educated people do not know how to gain access to the Internet.

A range of policies can help or hinder Internet ecosystem development. Regulatory barriers and firewalls can impede the free flow of information, and well-intentioned and important controls on content and data management designed to keep the Internet safe for children, for example, can become restrictive in business operations.

Protectionist barriers can include blocking the ability of "foreign" companies to compete using the Internet. Such barriers can reduce the competitiveness of local companies. Consumers lose when competition is constrained, and we have found consumer surplus to be among the most important forms of Internet impact.

Regulatory environments, influenced by governments, can help Internet ecosystems to thrive (see Box E2, "Aspiring countries face obstacles to enhancing the impact of the Internet"). Where policy makers have supported competition and transparency, and provided rights of way and spectrum access without discrimination, they have helped level the playing field for all Internet businesses.

Policy makers in aspiring countries can enable Internet companies and entrepreneurs to thrive in local markets by lowering barriers to registering a business, or easing access to capital. Some countries have done this through government-funded venture capital organizations. Morocco's Maroc Numeric Fund, for example, focuses on providing first-round capital to Internet start-ups.

Aspiring countries can also invest in making their countries a core part of the global supply chain of Internet-related goods and services. From Morocco's Rabat Technopolis to Dubai's Internet City, aspiring countries are positioning themselves as low-cost manufacturing hubs for ICT goods, with governments promoting clusters of both manufacturing and innovation. Malaysia's Multimedia Super Corridor is one example. Another is Taiwan's Industrial Technology Research Institute. Such investments are often made to anchor a larger ecosystem populated by domestic and multinational private firms. National universities with an ICT focus can also play this anchoring role, especially when governments step in to promote relationships between academic research and the private-sector R&D environment.

Beyond setting policy and promoting Internet ecosystems, governments can use the Internet to provide better services for their citizens. In the aspiring world, e-government services are just getting started, but plenty of growth and innovation has been observed, especially in the "m-government" space.

The Internet creates an opportunity for governments to: (1) deliver convenient and transparent services for their citizens; (2) achieve cost savings for the government; (3) achieve cost savings for citizens and businesses; and (4) generate revenue for the government. While developed countries often have robust e-government offerings, aspiring countries vary widely in what government services are provided online.

Many aspiring countries have started to provide information to citizens online. The development and execution of transactional services require a higher level of technical sophistication, and such services are more the hallmark of mature Internet ecosystems than nascent ones. Nevertheless, examples of successful transactional e-government services in aspiring countries exist. Hong Kong's Information Technology and Broadcasting Bureau, for example, has increased efficiency in the government by reducing processing costs from $1.90 per transaction at the counter to $0.80 online.

However, so far only a small fraction of online users in aspiring countries have access to e-government services. If e-government services were offered in aspiring countries at the level of availability and sophistication they are in developed countries,[20] their number of online users could reach 327 million (or one-third of all present-day online users in aspiring countries). Among the actions needed to achieve this level of sophistication would be considerable government investments in developing online offerings (e.g., driver's licenses, tax forms and filings, online education offerings), while more citizens become digitally literate and Internet penetration increases. The penetration need not be PC-based, as aspiring countries are innovating in m-government services to serve their many citizens whose Internet access is through mobile devices.

The role aspiring-country governments can play in enabling Internet impact varies from country to country. Some governments foster Internet ecosystem development through infrastructure investment and regulation e.g., the United Arab Emirates; others actively nurture Internet usage through lower access costs and digital literacy programs, e.g., Hungary; and some promote Internet ecosystem health with innovative e-government services, e.g., Taiwan.

7. Aspiring countries can leverage their distinct characteristics to drive the development of Internet ecosystems

Each aspiring country has a different set of macroeconomic characteristics that can be leveraged to build more robust Internet ecosystems. For those aspiring countries that are embarking on a journey to create their own successful Internet ecosystem, the experiences of their predecessors are germane, and can be drawn upon for useful lessons. Because each aspiring country is unique, we expect different paths will be followed, but the potential benefits from a more digitized society are many and obvious.

We have identified five major macroeconomic attributes that characterize an economy. Most countries possess one or more of these attributes, which include natural resources, global position as a hub of trade, potential for innovation, strong local consumption, and a strong SME sector.

1. **"Resource-rich"** countries that extract highly profitable natural resources (e.g., oil, natural gas) often have the capacity to invest and build Internet infrastructure and other foundational elements, e.g., digital literacy, and make it possible for their citizens to access the Internet. Some countries in our aspiring group are already doing this and investing in mobile or broadband infrastructure, or promoting device access and digital literacy through government-funded or supported programs, e.g., Argentina.

2. **"Hub-of-trade"** countries with a highly developed export economy can invest in ICT-enablement for their enterprises and attract multinational ICT manufacturers to their trade centers, e.g., Vietnam. Countries that are already hubs of ICT manufacturing and export can then create ICT parks focused on innovation, with research institutes, investment firms, and private companies, in an effort to move up the value chain, e.g., Malaysia.

3. **"Innovation-potential"** countries investing significant resources in R&D benefit from large pools of highly educated and creative individuals who can develop new products, e.g., Hungary. Such countries can focus on developing bridges between ICT and Internet-related research facilities and companies, providing access to financial capital to innovative Internet products and ideas, and facilitating the process of starting a business for their newly digitally literate human capital.

20 As measured by the United Nations' E-Government Development Index, the UN's ranking system, from 0 to 1, is used to indicate the level of maturity of e-government services, with variables including policy, infrastructure development, and mobile solutions. United Nations, "e-Government survey 2010."

4. **"Strong-local-consumption"** countries are heavily reliant on domestic production and consumption as a share of their economy, e.g., Turkey. In such countries, Internet household penetration, higher usage and the enablement of commerce platforms for e-commerce can be promoted to help businesses better address domestic consumer demand. Here Internet-related goods and services may further unlock Internet ecosystem benefits.

5. **"Strong-SME-sector"** countries are those where SMEs employ a large share of the workforce, e,g., Poland. Such countries can benefit from development of broadband infrastructure for SMEs and steps to lower the cost of hardware and Internet access.

The economies of most aspiring countries are composed of a mix of these five characteristics, and in promoting their Internet ecosystems they can rely on one or another or a combination, capturing the advantages that flow from them. Developing, forming, and committing to a path of Internet ecosystem enhancement will require participation from all stakeholders in aspiring countries (see Box E3, "All key stakeholders can do a great deal more to unlock the economic and social impact of the Internet"). The rewards, however, are potentially immense, as the experience of the developed economies demonstrates.

Box E3. All key stakeholders can do a great deal more to unlock the economic and social impact of the Internet

Governments can support the development of the foundations of the Internet ecosystem by promoting open access to the Internet, low Internet access costs, broad Internet coverage and digital literacy. To support innovation and entrepreneurship, the educational system must connect with the R&D environment. Governments can even establish innovation hubs. Policy makers also have a role in enabling Internet companies and entrepreneurs to thrive in their local markets. This role includes supporting competition and transparency, and providing rights of way and spectrum access without discrimination. To help bridge the domestic Internet ecosystem to the global one, and ensure that local businesses are globally competitive, policy makers can support international standards and facilitate data transfers.

Enterprises have much to gain from a robust Internet ecosystem. To capture these benefits, enterprises can invest in Web technologies themselves and train their employees to leverage them, too. They can also support local education and digital literacy efforts, even in partnership with local governments. Public-private partnerships can help bring infrastructure to far-flung regions, technology-based solutions to local problems, and even help local businesses become micro-multinationals.

Entrepreneurs can develop innovations that address local constraints and allow Internet ecosystems to leapfrog up the Internet development curve. These innovations can promote Internet use in a self-reinforcing cycle. Examples of these efforts are described in this report; they include innovative cashless payment solutions, marketing through social networks, and various online sales and buying platforms. Each of these successful solutions promotes Internet use, which in turn can enable further adoption of these solutions.

Individuals can drive the positive impact of the Internet in aspiring countries by not only continuing to adopt and use Internet-based products and services, but also by applying the principles of good citizenship and civil society to online behavior. This includes respecting rightful laws and others' privacy, and supporting civic organizations and dialogue.

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