

The great transformer: The impact of the Internet on economic growth and prosperity

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INTRODUCTION

The Internet is changing the way we work, socialize, create and share information, and organize the flow of people, ideas, and things around the globe. Yet the magnitude of this transformation is still underappreciated. The Internet accounted for 21 percent of the GDP growth in mature economies over the past 5 years. In that time, we went from a few thousand students accessing Facebook to more than 800 million users around the world, including many leading firms, who regularly update their pages and share content. While large enterprises and national economies have reaped major benefits from this technological revolution, individual consumers and small, upstart entrepreneurs have been some of the greatest beneficiaries from the Internet's empowering influence.

And yet we are still in the early stages of the transformations the Internet will unleash and the opportunities it will foster. Many more technological innovations and enabling capabilities such as payments platforms are likely to emerge, while the ability to connect many more people and things and engage them more deeply will continue to expand exponentially.

As a result, governments, policy makers, and businesses must recognize and embrace the enormous opportunities the Internet can create, even as they work to address the risks to security and privacy the Internet brings. As the Internet's evolution over the past two decades has demonstrated, such work must include helping to nurture the development of a healthy Internet ecosystem, one that boosts infrastructure and access, builds a competitive environment that benefits users and lets innovators and entrepreneurs thrive, and nurtures human capital. Together these elements can maximize the continued impact of the Internet on economic growth and prosperity.

THE INTERNET IS DRIVING ECONOMIC GROWTH

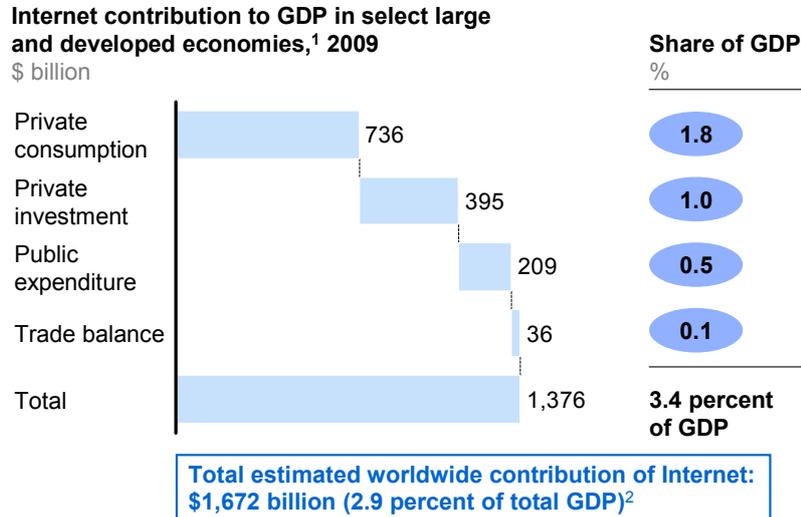
From an obscure network of researchers and technology experts three decades ago, the Internet has become a day-to-day reality for more than a quarter of the world's people. Today two billion people are connected to the Internet, and almost \$8 trillion exchange hands each year through e-commerce.

Strong contribution to GDP growth

Across a range of large and developed economies, the Internet exerts a strong influence on economic growth rates. Our research shows that the Internet accounts for, on average, 3.4 percent of GDP across the large economies that make up 70 percent of global GDP. (See Exhibit 1.) If Internet consumption and expenditures were a sector, its weight in GDP would be bigger than the energy or agriculture industry. (See Exhibit 2.) The Internet's total contribution to global GDP is bigger than the GDP of Spain or Canada, and it is growing faster than the GDP of Brazil.

EXHIBIT 1

The Internet constitutes 3.4 percent of GDP in large and developed economies



1 We looked at the Internet contribution in 13 countries constituting 70% of global GDP. The countries studied include G8 countries; China, India, and Brazil (emerging countries); and Sweden and South Korea (as they are most advanced countries in terms of broadband penetration).

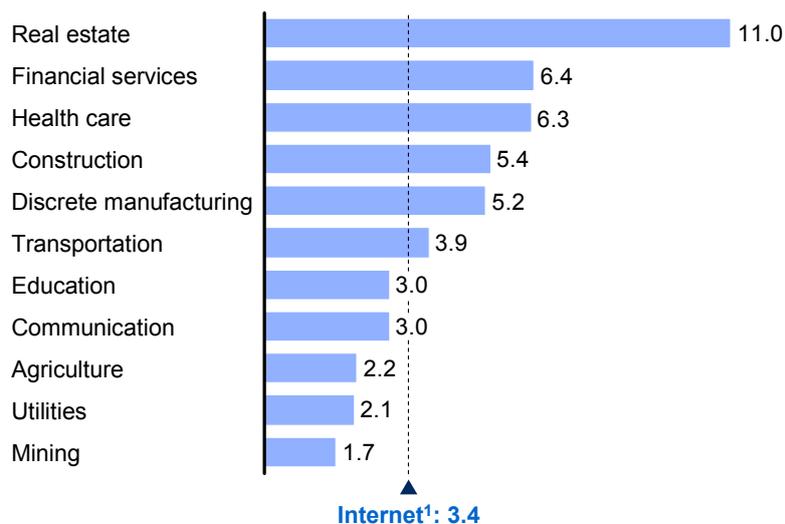
2 For the rest of the world, we used estimated percentage shares based on Internet penetration in each country.

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

EXHIBIT 2

If Internet were a sector, it would have a greater weight in GDP than agriculture or utilities

Sector contribution to GDP, 2009
% of total GDP



1 Internet share includes parts of other sectors (e.g., communication).

SOURCE: Organisation for Economic Co-operation and Development; McKinsey analysis

In the advanced economies we studied, the Internet accounted for 10 percent of GDP growth over the past 15 years, and its influence is growing. Over the past five years, the Internet's contribution to GDP growth in these countries doubled to 21 percent. If we include the large, emerging economies of China, India, and Brazil, the Internet contributed 7 percent of growth over the past 15 years and 11 percent over the past five. In countries such as Turkey, Malaysia, and Mexico, where both Internet usage and GDP per capita fall within the medium range on the global scale, the Internet has also contributed substantially to economic growth, though to a lesser degree than in mature economies. Research currently under way suggests the Internet drove roughly half as much GDP growth in these countries—still a substantial amount with the potential to increase significantly. However, there is sizable variation among countries, including those at relatively similar stages of development, leaving tremendous room for further Internet-related growth.

Internet ecosystem maturity related to rising living standards

There is also a clear connection between the maturity of the Internet ecosystem¹ and rising living standards. We found that an increase in Internet maturity similar to the one experienced in advanced countries over the past 15 years correlates with an increase in real per capita GDP of \$500 on average during this period. It took 50 years for the Industrial Revolution of the 19th century to achieve the same results. This demonstrates both the magnitude of the positive impact the Internet delivers to all levels of society and the speed at which it delivers them. The correlation to increased living standards is particularly relevant for developing economies, where the potential exists to rapidly leap forward and drive Internet-related growth.

Although the United States has thus far led in terms of the strength of its Internet infrastructure, access, and innovation, the landscape is evolving rapidly. India, China, and Brazil have the fastest-growing ecosystems, and other developed and developing countries are rapidly growing their usage through improved infrastructure and access.

The Internet drives business transformation and economic modernization

Rejuvenating traditional activities has been the Internet's main impact. The Internet has enabled fundamental business transformations that span the entire value chain in virtually all sectors and types of companies—not just online ones. These shifts include wholesale changes not only in how products are bought and sold but also in how products and services are designed, produced, and distributed. Even a tiny business today can operate with a dynamically managed supply chain that spans geographies and operates with a global workforce. Our global Small and Medium Enterprise (SME) survey found that 75 percent of the economic impact of the Internet accrued to traditional companies that would not define themselves as pure Internet players. These businesses have benefited from the higher productivity the Internet enables.

The Internet can also serve as a powerful catalyst for job creation. Of course the Internet has made some jobs obsolete. However, early evidence suggests the Internet can be a net job creator. Jobs are created in the Internet ecosystem itself, as Internet companies hire workers

1 The McKinsey Global Institute created an index to reflect Internet maturity of a country. Referred to as the e3 index, it measures e-*ngagement*, e-*nvironment*, and e-*xpenditure*, which are themselves largely based on numbers provided by the World Economic Forum and OECD. Weighing these three components, the e3 index represents the depth of a country's maturity in access infrastructure and Internet usage by individuals, businesses, and governments. Scandinavian and North American countries, three north European countries (the Netherlands, Switzerland, and the United Kingdom), and South Korea capture the top ten positions in our e3 rankings. See McKinsey Global Institute, *Internet matters: The Net's sweeping impact on growth, jobs, and prosperity*, May 2011.

ranging from engineers to sales and service personnel who design and deliver Internet products and services. However, the Internet also has helped create jobs in other industries. A detailed analysis of the French economy, for example, showed that while the Internet is reported to have destroyed 500,000 jobs over the past 15 years, it created 1.2 million new ones, a net addition of 2.4 jobs for every one destroyed. This conclusion is supported by McKinsey’s global SME survey, which found 2.6 jobs were created for every one destroyed.

LARGE ENTERPRISES HAVE CLEARLY BENEFITED, BUT CONSUMERS AND ENTREPRENEURS ARE THE BIG WINNERS

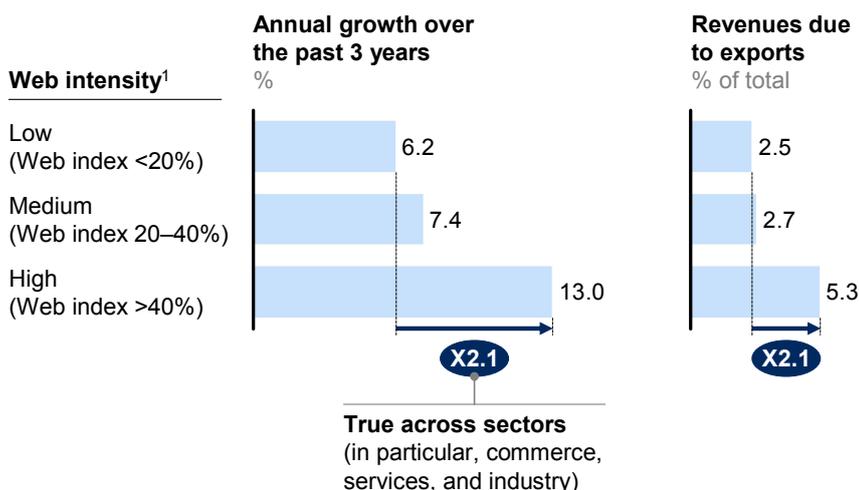
Across a range of industries, large businesses have created significant value from dynamic, diversified supply chains, global talent sourcing, and analysis of large data sets. They have increasingly engaged customers, incorporating their feedback into product innovations and streamlining their research pipelines.

While Internet usage triggers performance improvements in large businesses, the influence is even more profound among SMEs and start-ups, however. In a survey of more than 4,800 SMEs in 12 countries (our study group excluding Brazil) we found that those utilizing Web technologies grew more than twice as fast as those with a minimal Web presence. These results hold across all sectors of the economy. Furthermore, Web-savvy SMEs brought in more than twice as much revenue through exports as a percentage of total sales than those that used the Internet sparingly. These Web-knowledgeable enterprises also created more than twice as many jobs as companies that are not heavy Internet users. This is true across sectors from retail to manufacturing. (See Exhibit 3.)

EXHIBIT 3

Small and medium-sized enterprises using Web technologies extensively are growing more quickly and exporting more widely

Growth and exports of SMEs analyzed by cluster of maturity of Internet
 Analysis includes 12 countries and more than 4,800 SMEs



¹ McKinsey Web index defined according to the number of technologies possessed by companies and the penetration of those technologies (i.e., the number of employees/customers or suppliers having access to those technologies).
 SOURCE: McKinsey SME survey

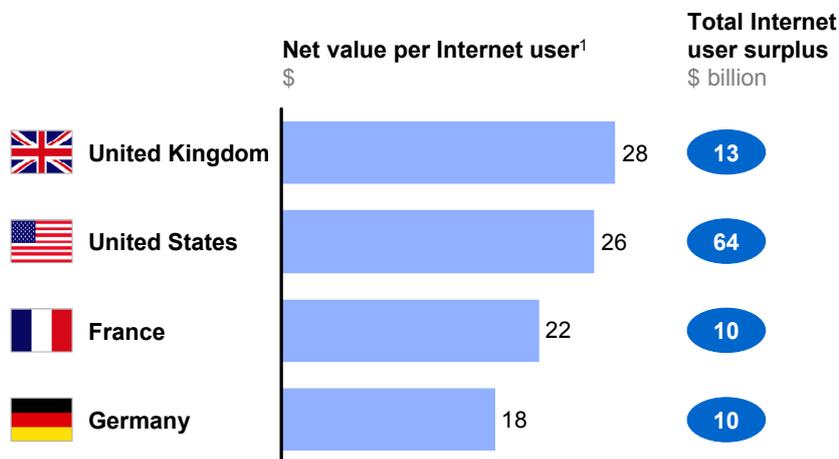
The Internet’s biggest impact on SMEs has been as a great leveler, making it possible for a small firm to be a global company from day one, with the reach and capabilities that once only large companies could possess. They can reach customers, find suppliers, and tap talent on

the other side of the world and also use the Internet to provide significant marketing and brand muscle. As a result, small firms can compete like big ones. This has led to the emergence of so-called micro-multinationals, some of which are “born global.” In other words, these companies start with operations and business relationships in multiple countries, breaking the old mold of entrepreneurship that begins in a single country and only expands to others when the company has reached a large scale.

But we should not overlook people—the real beneficiaries of the Internet’s growth. The Internet has fundamentally empowered the consumer, allowing shoppers to compare prices, find instant sales, and locate specific makes of automobiles or attractive rental properties without the use of brokers and dealers. It can offer road directions or health information. It saves the consumer time, boosts price transparency, and gives customers access to hard-to-find products. Academic research demonstrates that the more consumers visit price comparison Web sites, the lower prices fall and the greater the difference between the average and minimum prices for a particular good. Preliminary research shows online prices are, on average, 10 percent lower than their offline counterparts as a result of the price transparency that search tools offer. The economic surplus captured by consumers from web services alone ranges from \$18 a month per user in Germany to \$28 in the United Kingdom. The consumer surplus generated by the Internet in 2009 ranged from \$10 billion in France to \$64 billion in the United States.² (See Exhibit 4.)

EXHIBIT 4

The value of the surplus accruing to users of the Internet varies between \$18 and \$28 per user per month in each country



¹ All in the same currency based on Organisation for Economic Co-operation and Development exchange rates.
 SOURCE: McKinsey study (with Internet Advisory Board); Yankee; McKinsey analysis

People have benefited not just as consumers but as citizens, individuals, and members of communities as large as nations and as small as a city block or focused around a particular common interest. The degree to which people use the Internet to seek personal connection,

² McKinsey & Company High Tech Practice, *The impact of Internet technologies: Search*, July 2011.

public information, and new knowledge is large and increasing. For example, 82 percent of US Internet users start with a search engine when they look for public information or complete a transaction with a governmental entity, while 80 percent use a search engine as a starting point for health queries.³ Public organizations and nonprofits are increasingly using the Internet to conduct their operations, enhancing a range of services from disaster relief coordination to public safety campaigns. The value of such Internet-enabled activities is immense and in most cases flows directly to individual people.

LOOKING AHEAD, THERE IS MORE TO COME

Despite its magnitude and reach, the Internet is still very much in its infancy. We can expect new technologies to continue to shape the landscape of possibilities as people and things become ever more connected to the Internet and to each other. As we look ahead, we can already see a number of trends that embody these shifts in technology, connectedness, and use models.⁴

The need to access and analyze “big data”—the large datasets generated from every customer interaction, every wired object, and every social network—represents one example. The sheer volume of this data is staggering: enterprises globally stored more than seven exabytes of new data on disk drives in 2010, while consumers stored more than six exabytes of new data on devices such as PCs and notebooks. This trend has the potential not only to drive competitiveness in the private sector but to fundamentally transform government operations, health care, and education. If US health care could use big data creatively and effectively to boost efficiency and quality, the potential value captured could be more than \$300 billion every year, two-thirds in the form of reduced health care expenditures.⁵

Most of this “big data” will be processed not in individual computers but in “the cloud,” computing power provided through networks rather than on a local computer. The rise of cloud computing facilitates a new wave of innovation whereby functions such as e-mail and contact management are provided as a service and users can more fluidly collaborate in real time. Cloud computing and other collaboration technologies promise to increase the efficiency and effectiveness of workers in knowledge-based activities through shared virtual workspaces and social networks. These technologies can also improve educational services, giving young and adult students alike access to low-cost content, online instructors, and communities of fellow learners. Cloud services can also greatly reduce the cost of acquiring new applications, for both large and small enterprises alike, by allowing them to pay for services “on demand.” The actual amount of capital required to start an IT-enabled business has plummeted by an order of magnitude, because an entrepreneur often no longer needs to purchase servers, software, and other IT infrastructure.

When physical assets themselves become elements of an information system, with the ability to capture, compute, communicate, and collaborate around information—then the “Internet of Things” can become a powerful, transformative tool. The more we connect our objects, the more powerful that network becomes. Embedded with sensors, actuators, and communications capabilities, objects from bridges to packages being shipped are beginning to generate and transmit information on a massive scale and, in some cases, to adapt and react automatically

3 ComScore qSearch.

4 See Jacques Bughin, Michael Chui, and James Manyika, “Clouds, big data, and smart assets: Ten tech-enabled business trends to watch.” *McKinsey Quarterly*, August 2010.

5 See McKinsey Global Institute, *Big data: The next frontier for innovation, competition, and productivity*, May 2011.

to changes in the environment. These “smart” assets can make processes more efficient, give products new capabilities, and spark novel business models.

Finally, there will be fundamental shifts in how people are organized into increasingly flexible and multifaceted networks. The ability to organize communities of Internet participants to develop, market, and support products and services is moving from the margins to the mainstream. And Internet communities are beginning to perform tasks that enhance the public good, from updating missing person lists during natural disasters to sharing health information about rare disease. And the assumptions underlying traditional organizational models will be stretched as social networks link employees, former employees, customers, and stakeholders across organizational silos and engage them in solving problems, whether servicing a complex technical support issue or securing the right talent for a specialized project.

MORE CAN BE DONE TO FULLY CAPTURE THE BENEFITS OF THE INTERNET

Given the trends described in the previous section, we believe that the benefits of the Internet can grow in every country. While the Internet accounts for around 6 percent of GDP in countries such as Sweden and the United Kingdom, in others, its contribution is below 4 percent, leaving tremendous room for further expansion. In less developed countries, the room for expansion is even greater. Such economies have a great opportunity to “leapfrog” in their use of Internet technologies, just as some developing countries implemented modern mobile telephony rather than follow the pattern of developed countries in deploying landline infrastructure first.

Our research shows that a strong Internet ecosystem—one that fosters competition, encourages innovation, develops human capital, and builds out a comprehensive Internet infrastructure and boosts access—enables a country to capture the maximum value this technological transformation offers. (See Exhibit 5.) However, there is no single path to build an effective Internet economy. Countries can find different areas of expertise from which to grow the support systems for their innovative new industries. As policy makers look to enhance the positive impact of the Internet on their economies and their citizens, there are a number of lessons to guide the path they choose.

- **Foster competition.** Countries that make their markets more open and competitive achieve greater productivity. Such competition ensures that the most innovative and productive companies create more attractive products and services for users and gain market share at the expense of the less productive. In the Internet’s rapidly changing environment such renewal is particularly important to ensure benefits are captured. The countries that have benefited most from the Internet’s contribution to growth have tended to have open and highly competitive Internet ecosystems.
- **Encourage innovation.** An environment that encourages innovation and entrepreneurship is vital to capturing Internet-related growth. Features of such an environment include access to start-up capital, protection of intellectual property rights, support for research and development, and the availability of world-class “commons research” conducted by research universities and government-funded teams. For example, Israel and South Korea, like the United States, have taken strides to ensure that sufficient financing and the right financial mechanisms are available to seed innovation and support entrepreneurial resolve. Israel’s defense industry has served as a robust seedbed for Internet innovation, as was the Defense Advanced Research Projects Agency (DARPA) for the United States in previous eras, while the density of Internet connections in South Korea has led to innovative approaches to gaming and social networks.

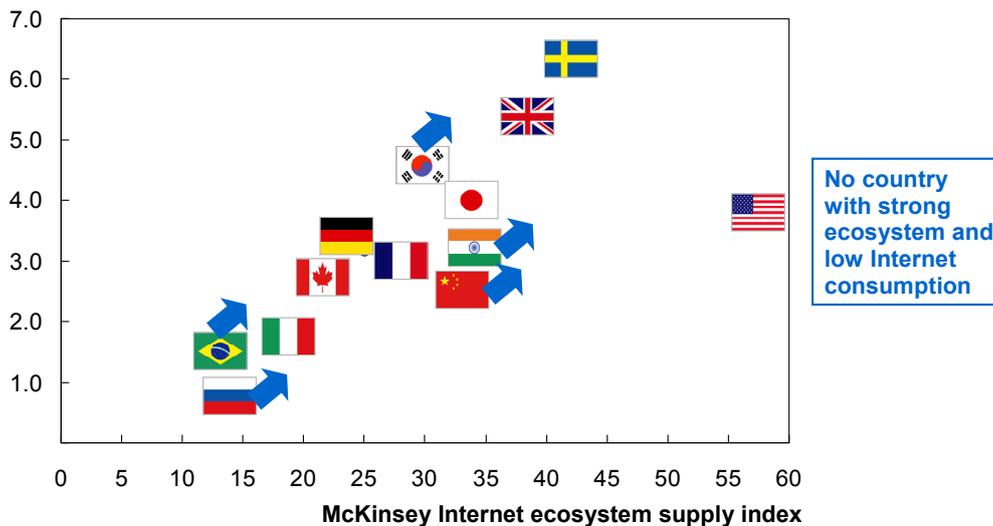
- **Develop human capital.** The United States in particular has used its vast talent pool, tolerance for risk, and excellent resources in tertiary education to promote Internet-related human capital, serving as an incubator for new industries and as a magnet to attract talents from around the globe. This talented human capital has been attracted, generated and nurtured by universities, corporate Research and Development centers, and early stage companies. Clusters of entrepreneurship and innovation have formed around world-class universities that have created the dense, interconnected social webs of personal relationships that underlie a risk-taking, startup culture. As a result, the United States is today the country with the most diverse structure within the global Internet ecosystem, garnering relatively equal contributions from hardware, software, services, and telecommunications. However, the United States will increasingly compete for such talent with other countries, as rivals try to emulate some of the features that have characterized US success as well as come up with innovations of their own.
- **Build infrastructure.** Infrastructure, the foundation of the entire Internet ecosystem, is a prerequisite for growth. It creates the platforms upon which users and organizations experience the Internet and upon which entrepreneurs and businesses innovate. The United Kingdom and Sweden have leveraged very strong infrastructure to gain greater importance within the global Internet ecosystem.⁶ The strength of their telecom operators has made a major contribution to their success in this area. The need to build infrastructure is not just an issue for developing nations. As the Internet continues to expand in an era of cloud computing, big data, and other innovations that will engage users more deeply, infrastructure requirements will continue to grow, even in the most advanced economies.

EXHIBIT 5

Countries with a high Internet contribution to GDP correlate to those with a strong Internet supply ecosystem

➔ Growth >10%

Internet contribution to GDP
%



No country with strong ecosystem and low Internet consumption

SOURCE: McKinsey analysis

6 While the United Kingdom has strong Internet usage, it has lagged behind other countries in terms of Internet speed, falling below the average for OECD countries. Organisation for Economic Co-operation and Development, broadband statistics, September 2010.

Of course, certain risks have grown with the Internet's rapid adoption. Concerns about privacy, online fraud, identity theft, and hacking of sensitive materials and databases have captured significant attention. The frameworks that govern access, usage, protection of various rights, and considerations of security must be continually reviewed. But these legitimate policy concerns need to be weighed against the opportunity and growth potential the Internet offers to enrich lives, build businesses, and give consumers enhanced choices in the years to come. Achieving the joint aims of security and protection on one hand and economic growth and participation on the other will require collaboration across the private, public, and nonprofit sectors.

Policy makers and business leaders should collaborate in a fact-based, public-private dialogue to assure optimal conditions for the development of the Internet ecosystem within each country as well as internationally. Open discussions between governments and business leaders can help create a constructive environment in which the benefits of the Internet can be better understood and the Internet ecosystem can grow. Issues such as standards for digital identities and intellectual property protection can be considered as countries strive to stimulate usage, while topics relevant to improving the supply ecosystem include the availability of talent and the overall business environment.

Finally, many governments themselves could benefit from increasing their own use of the Internet to transform the efficiency and effectiveness of the public sector. In many countries, parts of the public sector continue to suffer low productivity and the adoption of technology in the public sector often lags well behind what has been accomplished in the private sector. There is opportunity for both well-managed, large transformations as well as for smaller scale innovations. For instance, some local governments are shifting motor vehicle registration online, using a popular private sector strategy: rather than investing in an expensive, fully automated back-end system, they create public websites that gather the necessary information from the motorist and feed the data to existing back-end systems. Constituents see only a user-friendly front end—and avoid the trip to the licensing office. Some progress has been made as governments explore wider use of Web-based services and “e-government” initiatives; however the full power of Internet has yet to be unleashed to provide better services to citizens often at a lower cost.

CONCLUSION

The Internet has already served notice that it will be a disruptive force resolutely shaping the economy and society of the 21st century. But it can be a positive disruptor, supplying engines of growth to regions of the world that have been disadvantaged in the past, creating whole new industries from electrons and software code, and offering hope and opportunity to millions with its ability to spread knowledge, empower consumers, and organize social interactions.

As the aftermath of the global financial crisis challenges our government and business leaders to innovate as never before, we should not lose sight of the enormous value the Internet economy has already brought to rich and poor nations alike and its potential to boost growth across the globe.

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