

Solving for the Future:

Addressing Major Societal Challenges Through Innovative Technology and Cloud Computing

As economic challenges persist in communities, nations, and regions around the world, the importance of investing in long-term growth has never been greater. Governments worldwide have identified innovation as a key to unlocking new opportunities for growth and advancing national priorities—from healthcare and education to energy independence and climate change.

Information technology (IT) holds enormous potential to create jobs, increase productivity, and contribute to sustainable economic growth. In particular, [cloud computing](#) offers the promise of creating new business opportunities, providing new innovations to consumers, and helping governments become more efficient and responsive. In the simplest terms, cloud computing enables users and organizations to access data, software applications, and services—hosted remotely in datacenters—from any Internet-connected device. But to tap the full potential of cloud computing, it is important for the public and private sectors to work together. Microsoft welcomes the opportunity to collaborate with policymakers and other industry leaders to help tackle pressing global challenges and achieve important economic and social goals.



Working Together to Strengthen Economies, Address Societal Challenges, and Promote a Healthy Online Ecosystem

The following sections explore three crucial areas in which government policies can help the global economy and communities worldwide realize the benefits of IT and cloud computing. Each section identifies key policy priorities and recommendations.

Strengthening Economies

Innovation has long been the engine of economic growth, and the benefits of technological innovation in areas such as cloud computing have the potential to further stimulate global economic opportunity. But sustaining and strengthening the capacity for innovation will require greater investment in research and development (R&D) by the private and public sectors, as well as policy leadership from governments. Economic competitiveness requires greater public investment in science and technology infrastructure, along with a renewed public commitment to developing the next generation of scientists, engineers, and technology workers.

Invest in technology. The IT sector is a major economic engine worldwide—employing an estimated 35 million people globally and driving nearly US\$2 trillion in annual spending. The global IT sector is projected to generate more than 7.1 million new jobs and account for the creation of more than 100,000 new IT companies between 2007 and 2011. Cloud computing is expected to add US\$800 billion in net new business revenue to the economies of 52 countries between 2009 and 2013. Governments can encourage the continued creation of new companies and jobs by enacting policies that promote further investment in the IT sector.

Ensure choice in government procurement. Government investment in IT infrastructure—including cloud services—in key sectors such as healthcare, education, and energy can help spur efficiency and expand economic opportunity. When government procurement policies are objective and merit-based, they ensure that government departments have the widest possible choice among IT products and services and can make decisions in an open and transparent manner. Governments are best served when they do not rule out—or give preference to—specific products or suppliers by mandating certain business, development, or licensing models.

Promote a responsible move to cloud computing. The growth of cloud computing offers tremendous opportunities but also presents new challenges and responsibilities for both the private and public sectors. Governments can promote widespread adoption of cloud services by fostering user confidence in cloud computing, especially in the areas of privacy, security, and consumer safety. They can also adopt policies that encourage private investment in cloud computing.

Stimulate innovation through IP incentives. Intellectual property (IP) laws provide important incentives for innovation and creativity by enabling innovators to protect the value of their efforts. Conversely, the loss of that value through IP theft, including counterfeiting and piracy, results in lost jobs, a loss of about US\$600 billion in global revenues annually, and health and safety risks associated with unsafe products. Governments can help foster innovation and economic opportunity by enforcing existing IP laws and updating them as needed to adapt to new technologies. For instance, IP rules need to evolve and be applied online in ways that encourage new and beneficial uses of Internet technologies while fostering respect for the rights of all participants, including copyright owners and content creators.

Expand incentives for research. Government investment in basic research is critical to strengthening national competitiveness. Government-funded research at universities and government labs stimulates innovation and helps prepare the next generation of scientists and engineers. Academic research is especially important because it can spur advances that lead to future entrepreneurial ventures and thereby create new jobs and even new industries. Private-sector research also plays a critical role and can be further stimulated through R&D tax credits.

Educate the next generation of innovators. In response to economic and social changes, education systems must adapt and improve to help maintain and strengthen national competitiveness. All students deserve the opportunity to achieve their potential and develop the skills to succeed in a world that is increasingly complex, technologically driven, and globally competitive. This requires raising education and teaching standards, developing and rewarding effective teachers and principals, increasing graduation rates, and elevating student interest and participation—particularly among women and underrepresented minorities—in science, technology, engineering, and mathematics.

Enable talent mobility. Migration of talent plays an important role in shaping skilled labor forces throughout the world and contributes to the creation and diffusion of knowledge. To remain competitive, companies as well as countries must be able to attract and retain the most skilled and talented workers. Policies that encourage talent mobility benefit the global economy and produce benefits in both the receiving and sending countries.

Promote a global IT market. Returning the global economy to a path of growth and prosperity will require a shared commitment by governments to combat protectionism and keep markets open. Barrier-free trade in IT is particularly important to helping economies become more competitive and fostering global economic development. These goals can be further advanced if governments work together to enact and enforce trade agreements, expand opportunities for trade and investment, preserve consumer choice, and adopt policies that promote the dissemination and adoption of new technologies.

Expand broadband access. To tap the potential of the Internet and cloud computing, all businesses and citizens need high-capacity Internet access. In particular, rural and remote areas and underserved populations (including people with disabilities) cannot be left behind. Ensuring state-of-the-art connectivity for schools, libraries, and hospitals is also crucial.



Addressing Societal Challenges

Societies today face a number of major challenges, including improving healthcare and education, re-training workers for the technology-intensive economy, achieving energy independence, and mitigating climate change. Innovations in IT, including cloud computing, will help communities and governments address these challenges while also making public services more accessible, transparent, and responsive.

Improve healthcare. Advances in “health IT” can increase access to and improve the quality of healthcare while reducing costs and giving people more control over their health data. Cloud-based services can be instrumental in these efforts by offering healthcare organizations, patients, and referring providers a way to share health information before, during, and after treatment. Government policies in this area can ensure adequate protection of consumer privacy, promote efficiency and improved outcomes, and provide incentives to unlock health data from information systems that do not interact with other information systems.

Improve education. IT can play a key role in transforming education and promoting lifelong learning. Governments and the private sector can work with education leaders and other stakeholders to improve teacher and student IT skills and ensure access to IT tools and Internet connectivity. It is important for teachers to have access to IT-based teaching methods that enable a richer, more personalized learning experience, and for administrators to have access to the same software infrastructure that businesses already use to maximize efficiency and productivity. Cloud computing can be instrumental in expanding the quality and accessibility of education, particularly in remote and underserved communities, as well as reducing costs.

Expand worker retraining opportunities. In the global economy, computer literacy is an essential workplace skill. With IT employment worldwide projected to grow 15 percent in 2010—three times faster than general job growth—workers need retraining opportunities so they can be qualified to fill those jobs. Governments can use innovative and low-cost service delivery models to help workers learn IT skills, and nongovernmental organizations and the private sector can enhance opportunity and worker mobility by fostering lifelong learning skills as part of workers’ career paths.

Address energy and environmental challenges. Reducing energy use and limiting the effects of climate change will require technological advances that enable a transition to a zero-carbon economy. Governments can accelerate progress by funding basic research into renewable energy, providing market-based incentives for private sector investment, and promoting accurate measurement and transparent reporting of energy use and carbon footprints.

Make government more transparent and effective. IT and the Internet can facilitate greater citizen participation in government and the political process. They can also help make government data more available and usable, improve access to government services, and make government programs more transparent. Cloud computing offers an economical way to improve government performance, with some studies finding that agencies that migrate to cloud computing can cut their IT budgets in half.

Promoting a Healthy Online Ecosystem

The online ecosystem includes many participants—consumers, content creators, online publishers, advertisers, network operators, and service providers—whose activities and fortunes are deeply intertwined. Given the growing economic and social importance of the cloud and Internet-based services, governments have a strong interest in ensuring that the online ecosystem evolves in ways that promote competition, innovation, and consumer choice.

Promote online competition. The interconnected nature of the Internet means that a lack of competition in any single sector can quickly affect the entire ecosystem. To allow consumers to enjoy the benefits of vibrant online competition, governments can adopt policies that ensure competitive markets for all important online sectors, including advertising and search.

Promote user choice and interoperability. Users want the freedom to use whatever technologies and cloud computing services best meet their needs. Government policies can promote user choice by supporting industry-led efforts to promote interoperability among products from different online vendors and ensure that users have access to and control of their data and documents across various online products and cloud services.

Promote online privacy, transparency, and uniformity of laws across jurisdictions. When consumers surf the Web and use Internet-based services, they often leave a digital data trail. Users should be informed about their online privacy options through clear notices, be able to make choices about the use of their personal information, and be assured that their data will be protected. When enacting privacy laws, governments should include robust privacy protections for consumers while promoting data flow and data uses that are crucial to innovation. Governments can also encourage transparency from cloud service providers so users understand the terms of service and how their data will be used. To promote investment in cloud computing, governments should work together to facilitate uniformity of laws across jurisdictions and to avoid the uncertainty associated with conflicting rules on data storage and access across different jurisdictions.

Promote a trusted, safe, and secure Internet. The increased use of Internet-based services has many benefits for consumers and businesses, but it also raises potential security and safety risks. To strengthen online security, maintain the safety of users, and combat fraud, the Internet needs to be an end-to-end trust ecosystem where security is rooted in hardware and where hardware, software, data, and people can be authenticated in appropriate circumstances. Technological innovation must also address growing online threats such as ID theft, fraud, and child exploitation. Because so much of our critical infrastructure is online, governments have a compelling interest in securing IT systems and strengthening enforcement of laws against cybercrime.

Promote free expression. The growth of the Internet and communications technologies has led to a vast array of ways to publish and respond to news, information, and opinion. People are justifiably concerned about how these

developments can affect personal reputations, morals, and public order. But at the same time, such technologies offer tremendous potential to disseminate the truth, enhance accountability around the world, and help societies and individuals grow by encountering new ideas. Governments can help foster free expression and access to information by showing restraint in imposing restrictions on Internet content and online anonymity, and by engaging in intergovernmental dialogue and cooperation.

Increase access for people with disabilities. The demand for accessible technology is expanding as people with disabilities and the elderly become aware of the many ways in which technology can empower them and enrich their lives. Technologies that are easy to use let people of all ages and abilities access government services and further their education and employment opportunities. Governments can continue to encourage market-driven innovation across platforms and devices and interoperability among products, software, services, and assistive technology to foster the broadest possible array of solutions for people with disabilities.

Promote innovative technology offerings. Innovative new technologies built on Internet Protocol (IP) and Voice over IP (VoIP) give users access to an evolving array of communications, entertainment, and productivity tools and services. Governments can support the growth of such offerings by adopting policies that encourage investment in innovation while protecting consumers and promoting consumer choice.

Founded in 1975, Microsoft is a worldwide leader in providing software, services, and solutions that help people realize their full potential. Our partner-based business model, which includes more than 600,000 partners worldwide, and our commitment to investing in R&D—US\$9.5 billion in 2009—have generated millions of jobs and have helped make the IT industry one of the most vibrant sectors of the global economy. Since Microsoft's inception, we have worked to democratize computing by making IT more affordable and accessible.

As we enter the era of cloud computing, Microsoft is "all in." We believe that cloud computing will provide new opportunities for innovation, connectivity, and economic growth, and we are investing heavily in cloud services for both consumers and businesses. We are committed to investing in innovation, addressing the world's most pressing challenges, and advancing global prosperity through technology.

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