THE TECHNET INNOVATION INITIATIVE

AND

2005 INNOVATION POLICY AGENDA

THE TECHNOLOGY NETWORK
SILICON VALLEY SEATTLE BOSTON AUSTIN ORANGE COUNTY

MARCH 2005

EXECUTIVE SUMMARY

TechNet is committed to advancing U.S. competitiveness and economic growth. Public policies and private sector initiatives that spur our nation's innovation-driven global competitiveness are TechNet's top priority.

Throughout 2004, TechNet conducted a series of high-level events in each of our regional areas - New England, Texas, Pacific Northwest, Southern California and Silicon Valley - exploring the critical link between innovation and economic growth and identifying the key public policies that will determine whether and how our nation reaches its innovation potential.

Across the country, leaders in the range of innovation industries, from high technology to biotechnology to nanotechnology, drew a compelling vision of new technologies and emerging industries that will present unparalleled opportunities for the United States -- as well as for our global competitors.

Technological advances, the convergence of computing, communications and content and cross-disciplinary innovations are creating new technologies and whole new industries. The result will be a new era of innovation and potentially explosive economic growth.

But American preeminence in this new era is not assured. In fact, on every front, U.S. global competitiveness is being challenged.

Many other nations are rapidly catching up to -- and even surpassing -- the United States in areas of traditional American leadership. Our global competitors are investing in education, encouraging entrepreneurship through expanded use of employee stock options, and making next generation infrastructure a priority.

Across the country and in every sector of the technology industry, CEOs, academics and policymakers identified a consistent set of challenges to America's innovation leadership:

1. **The United States education system is not preparing young Americans for the careers of the future.**

2. **The United States is no longer assured of attracting and retaining the world's best innovators.**

3. **Global innovation leadership will require a long-term, strategic approach to creating an ecosystem that fosters innovation.**

4. **The United States is gravely under-investing in research and development.**

5. **The United States lags behind other nations in the deployment of broadband networks that are the foundation of the next wave of technology innovation.**

To begin meeting this challenge, TechNet has developed a policy agenda to strengthen our nation's competitiveness and the Innovation Economy. TechNet's 2005 Innovation Policy Agenda is:

1. **Strengthen Education and Develop a Skilled Technology Workforce**

   Specifically, TechNet supports:

   - Continued implementation and full funding of the No Child Left Behind Act.
   - Making science, math, engineering and technology education a national priority by increasing funding for math and science partnerships and by supporting initiatives to improve math and science teaching and student learning;
   - Strengthening post-secondary education to achieve an increased yield of domestic higher education degrees in math, science and engineering;
   - Ensuring that American workers are prepared for the high-skill jobs of the future through effective retraining for displaced and unemployed U.S. workers;
   - Improved business immigration programs to retain the world's best innovators who will create new jobs and companies in the United States.

   Recognizing the technology industry's responsibility to contribute to an improved education system, TechNet has established an Education Task Force of some of the nation's leading CEOs to develop a new private-sector initiative to increase America's math, science and engineering talent. The Task Force will examine science and math preparedness in primary and secondary education as well as barriers to science and engineering degree attainment in postsecondary and graduate education.

2. **Maintain the U.S. Entrepreneurial Culture By Preserving Broad-based Employee Stock Options**

   Mandatory expensing will undermine U.S. efforts to spur innovation. This is not the time to shut down a proven engine of economic growth. TechNet supports:

   - A thorough study of the economic impact of the FASB's expensing standard prior to its implementation;
   - Implementation guidance that results in realistic valuation methods for employee stock options;
   - A thorough program of field-testing to insure the viability of any new standard prior to its implementation.

3. Create Opportunities for Expanded International Trade Beginning with Enactment of the U.S.-Central America and Dominican Republic Free Trade Agreement

Specifically, TechNet supports:

- Continued efforts to pursue a free-trade agenda, including moving forward with our WTO goals;
- Pursuit of additional bilateral and regional free trade agreements, opening new markets to U.S. products and services, beginning with early enactment of the U.S.-Central America and Dominican Republic Free Trade Agreement;
- Clearing hurdles that will allow U.S. companies and products to compete effectively around the world;
- Efforts to safeguard intellectual property through trademark, copyright and patent protections as well as enhanced enforcement provisions.

4. Promote Accelerated Broadband Deployment and Demand

Specifically, TechNet urges Congress and the Administration to:

- Continue to reduce regulatory burdens and uncertainty that impede or delay the deployment of broadband networks through technology-neutral reforms;
- Exercise regulatory restraint with respect to emerging broadband applications and services including Voice over Internet Protocol communications;
- Drive adoption of broadband through e-government initiatives, and policies that encourage broadband demand;
- Continue to reject government technology mandates in favor of industry efforts to develop market solutions that spur the availability of music, high-definition video and movies via the Internet;
- Continue efforts to modernize U.S. spectrum policy and increase spectrum availability and efficiency, including increasing unlicensed spectrum;
- Encourage broadband deployment to underserved communities and businesses through investment incentives, where necessary.

5. Promote Private Sector Initiatives to Improve Cyber Security

TechNet urges the Administration and Congress to support voluntary, private-sector initiatives that enhance the security of the nation's information infrastructure.

Given the importance of cyber security to our nation's critical infrastructures, TechNet also strongly advocates the creation of an Assistant Secretary for Cyber Security within the Department of Homeland Security and supports the "Department of Homeland Security Cybersecurity Enhancement Act," H.R. 285.

Throughout 2005, TechNet will continue to lead industry efforts to enhance cyber security and support the Administration and Congress in efforts to protect the nation's information infrastructure.

6. Increase Federal Funding for Basic Research at Key Agencies and Enact a Permanent Extension of the R&D Tax Credit

A strong federal commitment to funding basic research in science and engineering is critical to the long-term competitiveness of the technology industry and our nation's economy. TechNet urges Congress and the Administration to:

- Achieve increased appropriations for the basic research functions of the National Science Foundation consistent with the National Science Foundation Authorization Act of 2002, which authorized funding totals that would double the agency's budget by FY 2007;
- Support sufficient funds within the NSF budget for the Tech Talent Program, math and science partnerships program and other programs to strengthen America's technology leadership;
- Identify and act on other opportunities to support basic research and math, science or engineering education;
- Enact a permanent extension of the R&D Tax Credit to spur increased private sector research and development.

7. Pursue Legal Reform Initiatives That End Frivolous Lawsuits

Frivolous litigation costs the U.S. economy $200 billion a year and is a tremendous drain on resources that should be focused on innovation, not on meritless lawsuits. TechNet will continue to champion legal reform initiatives that strengthen our nation’s global competitiveness and technology leadership.

THE TECHNET INNOVATION INITIATIVE

TechNet is committed to advancing U.S. competitiveness and economic growth. Our members have been leaders in forging state and federal policies that encourage entrepreneurship, job creation and economic growth through innovation. Public policies and private sector initiatives that spur our nation's innovation-driven global competitiveness are TechNet's top priority.

Throughout 2004, TechNet conducted a series of high-level events in each of our regional areas - New England, Texas, the Pacific Northwest, Southern California and Silicon Valley - exploring the critical link between innovation and economic growth and identifying the key public policies that will determine whether and how our nation reaches its innovation potential.

The centerpiece of this series was the TechNet National Innovation Summit, a series of high-level dialogues with many of the nation's leading high technology CEOs and academics, including John Chambers, President and CEO, Cisco Systems; John Doerr, Partner, Kleiner Perkins Caufield & Byers; Paul Otellini, President and COO, Intel Corporation; Bill Joy, Founder, Sun Microsystems; Eric Schmidt, Chairman, Google; Terry Semel, Chairman and CEO, Yahoo! and John Hennessy, President, Stanford University. The Summit was conducted by renowned journalist Charlie Rose and nationally broadcast on PBS' *The Charlie Rose Show* in a special week-long series.

John Chambers, Paul Otellini, Eric Schmidt & Terry Semel discuss innovation with Charlie Rose at the TechNet National Innovation Summit.

The TechNet Innovation Initiative featured the nation's leading visionaries from industry, academia and policy-making and showcased the emerging technologies, industry initiatives, and policy challenges that will shape our future. The result is an Innovation Agenda of specific federal and state legislative and policy proposals to be implemented in 2005-2006.

This report highlights the key issues and recommendations developed through the TechNet Innovation Initiative.

A VIEW OF THE FUTURE: A NEW ERA OF INNOVATION

Throughout the TechNet Innovation Initiative, innovators in industry and academia highlighted trends underway in the technology and biotechnology industries that will present unparalleled opportunities for the United States as well as our European and Asian competitors.

Technological advances, the convergence of computing, communications and content and cross-disciplinary innovations are creating new technologies and whole new industries. The result will be a new era of innovation and potentially explosive economic growth.

THE NEW TECHNOLOGY CONVERGENCE

"The technology sector still has a lot of unrealized potential. Our best opportunity for growth lies in shifting our focus from developing technology for technology's sake to designing experiences around people's passions and the context of their lives."

Jim Allchin
Group Vice President
Microsoft Corporation

Computing, communications and content are merging, driven by microchip advances and always-on broadband access. Global communications and lifestyles are being transformed through handheld devices, gaming systems, high-definition television and wireless communications. Technology has become a means of delivering content -- including information, movies, music and photographs -- anywhere and anytime. The digital home and digital office are expanding efficiencies and improving quality of life.

The widespread adoption of digital technology for all forms of information transfer and storage is transforming the communications sector. Wireless technologies are revolutionizing mobile computing. Global use of wireless for email, web browsing, gaming, and text messaging is exploding. A fast-growing manifestation of convergence in communications is the increased use of Voice over Internet Protocol (VoIP) technology, which permits voice service to be offered as simply another application to broadband users.

We are on the threshold of a new era of always-on communication, digital media, and mobile

computing in which technology is pervasive and fully integrated into our lives. Some examples:

- Disposable, voice-based wireless phones without a display or keyboard;
- Small, foldable displays with gigabytes of memory and wireless built-in, constantly recording high-definition content to educate, inform and entertain;
- In-house appliances and systems that can be remotely controlled or accessed;
- Pervasive, secure, mobile access to personal digital media including photos, music, movies, text or numeric files;
- Mobile phones that serve as digital wallets, entertainment centers and a seamless connector to the Internet;
- Access to millions of movies and albums from the living room as the television, stereo and computer merge;
- Live e-learning via interactive video and supplemented real-time with access to gigabytes of organized data.

Technology convergence is transforming the way we do business through enhanced productivity and communications. It is beginning to revolutionize industries and disciplines from education to entertainment.

An exciting example is the health care industry. Telemedicine applications that are transforming healthcare range from tools that allow doctors to diagnose, monitor and treat patients in remote locations to sophisticated video-conferencing and streaming video that allows patients or doctors to consult with specialists around the world to combined robotics and telecommunications links that enable interaction between doctors over large distances for education or surgical care.

The impact of this converged, always-on world is increased productivity and economic growth that will raise standards of living and improve quality of life at an unprecedented rate.

BIOTECHNOLOGY

"The promise of biotechnology and targeted therapy is that we will pick exactly the patient who should get a medicine, and we will tailor therapies for patients."

Susan Desmond-Hellmann, MD
President – Product Development
Genentech

Another kind of convergence is transforming the biotechnology industry as biomedical, molecular and genomic sciences combine to create breakthrough therapies, drug delivery methods and health care strategies. The mapping of the human genome, the potential of stem cell research, nanotechnology and new Internet applications are weaving together with advances in biotechnology. These combined forces will redefine and redirect biotech research and development and the industry itself in the coming decade.

Biotechnology innovations are enabling truly personalized medicine in which the current one-size-fits-all therapies are replaced by patient-specific diagnoses, prognoses and therapy choices that are tailored to the specific genomic profile of an individual patient. Innovation is also enhancing collaboration, enabling information sharing and accelerating research and the pace of discovery. And, this convergence will create efficiencies and ultimately reduce health care costs significantly.

These technologies include:

- Molecular diagnostic screening that can predict organ compatibility, replacing intrusive and expensive biopsies;
- Affordable, personal genome sequencing available to an individual to predict susceptibility to disease and allow preventive treatment;
- Recombinant DNA techniques to treat disease and produce new medicines and more effective vaccines;
- Nano-biotechnologies that rely on the properties of biological molecules and cell processes to speed disease diagnosis and improve drug delivery;
- Nano-particle tumor suppressors that are already extending the lifespan of patients suffering from metastatic lung cancer beyond existing treatments.

The United States currently holds a competitive lead in the biotechnology sector, with 198,000 employees in 1,473 companies across the country working in the biosciences.[i] Today, 40 states are targeting biosciences compared to only 14 in 2001.[ii] The federal government's role in biotechnology also continues to expand, and significant growth in the budget of the National Institutes of Health and life sciences research funding is a bright spot in the R&D picture.

European and Asian initiatives, however, are also targeting growth within the sector and the biotechnology industry of the future will be increasingly competitive and global.

NANOTECHNOLOGY

"Like the Space Program, nanotechnology has the potential to create millions of U.S. jobs, generate economic wealth and attract thousands of U.S. students back to science and engineering programs."

Dennis Wilson
CTO, Chairman and Founder
Nanotechnologies Inc.

Nanotechnology is the ability to develop materials, tools, processes and devices at atomic, molecular or macromolecular dimensions, enabling products that are smaller, stronger, more efficient or have vastly improved functionalities.

This emerging technology has the power to transform healthcare, energy, electronics, manufacturing, transportation and national security. The National Science Foundation predicts that the global market for nanotech-based products will exceed $1 trillion by 2015.

The incredible nano-based applications being developed include:

- Targeted drug therapy using nanoslivers with anti-microbial/anti-pathogen properties and cellular-level cancer imaging and treatment;
- Carbon-based materials that are flexible yet stronger than steel;
- Hydrogen storage and fuel cells that enable energy efficiency and environmental benefits;
- Next-generation electronics with high-density memory;
- Chemical and biological threat detection and nanoparticle-based remedies that strengthen national security and homeland defense;
- Sensors able to detect a single diseased cell and guide nanoparticles that can treat tumors internally without damaging healthy cells.

Nanotechnology and its applications represent a rare opportunity to level the playing field of international technological leadership. For Fiscal Year 2005, President Bush requested $982 million for nanotechnology R&D within the National Nanotechnology Initiative.[iii] Globally, an estimated $8.6 billion was invested in nanotechnology R&D in 2004.[iv] At least 35 countries have established major government-funded nanotechnology initiatives including many European nations, Brazil, Chile, China, India, the Philippines, South Korea, South Africa and Thailand.[v]

THE INTERNET 2.0

"That's the big opportunity: to switch us back from the big, impersonal Web that we have on our desktops to a much more personal environment, with all sorts of new services that are very personalized."

Bill Joy
Co-Founder
Sun Microsystems, Inc.

Ten years after the Web starting making an impact on communications and commerce, 813 million people now use the Internet worldwide.[vi] U.S. online sales in 2004 were valued at approximately $69 billion, a 24 percent increase over 2003.[vii] There are as many as 10 million blogs today -- up from 5 million in 2003 and less than 100,000 in 2001.[viii] Moreover, 44 percent of Internet users have contributed content to the Web – from photos to book reviews to shared music or personal Web sites.[ix]

With the advent of wireless broadband Internet access, legal music downloading services, live Internet broadcasts of sporting events, blogs with the power to influence a presidential campaign and the availability of Web content on mobile phones, we are seeing developments that will change the Internet as much in the next 10 years as we have seen in the past decade.

The next wave of transformation is creating an Internet that is infinitely more personal, searchable and usable. The challenge now is to create an Internet that enables the user to seamlessly access real-time information that is uniquely personal and useful to the individual user – with reliability and ease. The result is "experience computing" in which technology and the Internet become more about people, their interests, their relationships, their communities and their experiences.

BEYOND THE WEB: INNOVATIONS IN ENERGY, WATER AND TRANSPORTATION

"Changes in the global environment require new thinking about energy, water and transportation. Technology holds the potential for cleaner, safer, more efficient approaches to these important challenges."

John Doerr
Partner
Kleiner Perkins Caufield & Byers

The Innovation Economy is not just about the Internet. Technology is transforming industries across the economy and creating opportunities for clean, distributed energy, water and transportation.

The energy industry is poised to undergo significant transformation as a necessary response to energy prices and supply, national security and environmental concerns. In addition, a growing world population and the migration from rural settings to urban centers will create condensed populations and a handful of megacities in Asia and around the world. These trends require a renewed commitment to cleaner and more efficient energy, water and transportation systems.

Emerging technologies in energy, water and transportation include:

- clean, quiet, emissions-free fuel cells for distributed generation of electricity;
- fuel-cell, hybrid or electric-power techniques that enable mass production of environmentally improved, high-performing automobiles;
- easy to deploy, flexible and low-cost solar roofing material produced through inexpensive, roll-to-roll mass manufacturing methods.

The material science underlying nanotechnology will form the basis for many of these new technologies including nano-based systems that enable more efficient and reliable methods of distributing water and energy. Solar panels engineered using nanotechnology-enhanced photovoltaics will connect to superconducting power lines made of carbon nanotubes, tiny tubes about 10,000 times thinner than a human hair that consist of rolled up sheets of carbon hexagons, to provide inexpensive, clean electricity.

Tiny wastewater filters could sift emissions from industrial plants, eliminating even the smallest residues before they are released into the environment. Similar filters could clean up emissions from industrial combustion plants. And nanoparticles could be used to clean up oil spills, separating the oil from sand, rocks and even from the feathers of birds caught in a spill.[x]

INNOVATION IS A GLOBAL PHENOMENON AND THE FUTURE IS UP FOR GRABS

"We can look over the Pacific Ocean to see how the technologies of the future are going to be developed and deployed. It's not that the United States won't participate in that. The issue is who is going to lead and who is going to follow."

Paul Otellini
President and Chief Operating Officer
Intel Corporation

"If we move slowly versus our global peers, we'll be left behind. That's the economic danger. It's about jobs and the economic future of our country."

John Chambers
President and CEO
Cisco Systems, Inc.

For the first time in half a century, the future is truly up for grabs. New technologies are creating new industries. Unlike the Industrial Revolution before it, the Innovation Economy is taking root globally. China, India, Russia and other nations are investing in emerging technologies to seize a competitive advantage in the industries and markets of the future.

Many other nations are rapidly catching up to -- and even surpassing -- the United States in areas of traditional American preeminence. Our global competitors are investing in education, encouraging entrepreneurship through expanded use of employee stock options, and making next generation infrastructure a priority. Foreign technology centers are increasingly attracting American talent. Our nation's technological and economic leadership cannot be taken for granted.

Across the country and in every sector of the technology industry, CEOs, academics and policymakers identified a consistent set of challenges to America's innovation leadership.

FINDINGS:

1. **The United States education system is not preparing young Americans for the careers of the future.**

   When we survey the global competitive landscape, perhaps the most significant threat we face is our declining commitment to math, science and engineering education relative to other nations.

   According to international assessments, American students begin to fall behind European and Asian students in math and science beginning in the 8th grade. In recent international

assessments, by 12th grade U.S. students ranked 19th in math and science out of 21 nations, behind students in Canada, Australia, Japan and many other Asian, Eastern European and European countries, and ahead of only Cyprus and South Africa.[xi]

Given these results, it is not surprising that the United States faces a rapidly declining number of students who study math, science and engineering at the college level. The proportion of the college-age population that earns degrees in math, science and engineering fields has been substantially larger in more than 16 countries in Asia and Europe, relative to the United States.[xii]

In recent decades, science and engineering (S&E) degrees have comprised approximately one-third of U.S. bachelor degrees. In recent years, science and engineering degrees comprised 59 percent of total degrees in China, 46 percent in South Korea and 66 percent in Japan.[xiii] In China, 39% of all students are studying engineering, compared to just 5% in the United States.[xiv]

At the graduate level, the picture is just as alarming, as the percent of the U.S. population that is studying science and engineering has declined while increasing in other nations. Of the 114,000 science and engineering doctoral degrees earned worldwide in 2000, for example, 89,000 were earned *outside* the United States.[xv]

The impact is clear: Many American students, ill-prepared in the foundations of math and science, are not well-equipped to succeed in undergraduate or graduate math and science programs, and cannot or will not pursue careers in the technology fields. Foreign-born students comprise most of the technology talent pipeline.

This alarming trend was recently articulated by U.S. Secretary of Education Margaret Spellings:

> *"We're at a crossroads. We still have the best system of higher education in the world, but the world is catching up. China graduates six times as many engineering majors as the U.S.; Japan and South Korea, four times as many. In 2001, India graduated nearly one million more students from college than the U.S., including 100,000 more in the sciences. Meanwhile, our young students lose ground as they age. Our fourth- and eighth-graders score above the international average in math and science, but our 15-year-olds lag below it... It's now our time. Together, we can show Americans a future where knowledge powers our economy and empowers our citizenry."*[xvi]

Unless we take steps now to improve our education systems, to strengthen math and science curricula and to attract more Americans to the math, engineering, science and technology fields, the United States will no longer produce the innovators of the future.

2. **The United States is no longer assured of attracting and retaining the world's best innovators.**

The contributions of highly educated and entrepreneurial immigrants to the U.S. economy have been profound. In the science, engineering and technology fields, in particular, the United States has been a magnet for the world's best talent. Foreign-born scientists, researchers and innovators have been central to the global competitiveness, economic growth and job creation that have stemmed from the U.S. technology industries. However, there are signs that the United States is losing its edge in attracting and retaining the world's best technology talent as a result of more complicated and restrictive U.S. immigration policies and increasingly attractive opportunities in other nations.

Asian students, in particular, are increasingly less likely to study in the United States. From 1994 to 1998, the number of Chinese, South Korean and Taiwanese students who chose to pursue doctoral degrees at U.S. universities dropped 19 percent, while the number who chose to pursue doctoral degrees in their own countries almost doubled.[xvii] In addition, as other nations invest in policies that lure back their citizens educated abroad and immigrants face significant hurdles in the U.S. visa and green card processes, the United States will lose an increasing share of the foreign-born talent that is educated at our universities.

As a result, the United States is at risk of losing the global entrepreneurs and innovators who will create many of the companies, industries and jobs of the future. Intel Corporation, Google, Sun Microsystems and eBay are among the many companies that were founded by foreign-born innovators who came to the United States to study and work.

In addition to the innovators who will create companies and jobs, the U.S. risks losing the technology workforce that we need to maintain our technology leadership. Since 1980, the number of science and engineering positions in the United States has grown at almost five times the rate of the entire U.S. private sector workforce.[xviii] Given the trends in science and engineering study by U.S. students, the United States faces a potential shortage in technology talent at all levels unless we continue to attract and retain the world's best minds.

3. **Global innovation leadership will require a long-term, strategic approach to creating an ecosystem that fosters innovation.**

Cycles of technological innovation are unpredictable. Scientific breakthroughs may not result in marketable products for decades. To maintain a lead in the fast-changing technology industries, companies must make long-term strategic gambles about the products and markets of the future -- investing billions of dollars in manufacturing facilities that will produce products that haven't yet been designed for markets that don't yet exist.

Policy-makers, too, must take a long-term view of the future. Central to the success of the U.S. economic system has been the spirit of entrepreneurial capitalism and innovation that

has fueled new technologies and new industries. A business climate that encourages risk-taking, start-ups and small businesses is in large part what has defined U.S. economic success relative to more traditional corporate cultures in Europe and Asia.

The U.S. system is fueled in large part by the strength of venture-back industries and the growth of broad-based employee ownership. Approximately 14 million American workers or 13% of the U.S. private sector workforce hold stock options.[xix] Increasingly, stock options are held by employees at all levels of a corporation. 79% of stock options holders earn less than $75,000 annually and 93% of stock options are held by middle-class and working-class Americans. Only 15 percent of option-holders identify themselves as managers.[xx]

Broad-based employee ownership has also had a powerful impact on U.S. productivity and economic growth. Seventy empirical studies of all forms of employee ownership show that it lifts a company's productivity level by about four percentage points over the long term, compared to firms that don't adopt such practices.[xxi]

Our foreign competitors are taking steps to emulate our economic system with policies that encourage risk-taking and employee ownership. Broad-based employee stock options in particular have fueled productivity growth and innovation in the United States. Yet, the U.S. Financial Accounting Standards Board is taking steps to mandate expensing of all employee stock options, reducing the ability of companies to offer the broad-based stock option plans that have fueled entrepreneurialism and innovation in the technology industries and across the economy.

It is very telling that just as the United States is taking steps that will sharply reduce or eliminate broad-based employee stock option plans, our competitors in Asia are aggressively increasing their use of options to spur productivity and growth. It is clear that to maintain our innovation leadership, the United States must preserve and strengthen an economic system that drives long-term innovation and productivity.

4. The United States is gravely under-investing in research and development.

Historically, governments have provided basic research funding or been an initial customer of key disruptive technologies from the telegraph to the transistor to the integrated circuit to the computer. Federally funded basic research has contributed to many of America's most important technology developments: the Internet, personal computers, the silicon chip, lasers, fiber optics and supercomputers.

As important, federally funded research centered at American institutions of higher education plays a critical role in the education and training of America's next generation of innovators - perhaps the leading factor in our nation's continued global competitiveness.

The United States, however, is gravely under-investing in this long-term basic research that is the undisputed foundation of innovation. With the exception of life sciences and

defense-related research, federal funding for basic research has remained relatively flat for over a decade.[xxii] In fact, U.S. funding of basic research in engineering and physical sciences has shown little or no growth over the past 30 years.[xxiii]

At the same time, our global competitors are increasing their investment in basic research. For example, from 1995 to 2002, China doubled its investment in R&D, from .6 percent to 1.2 percent of its gross domestic product (GDP). The Chinese government has indicated its intention to significantly increase its basic research spending in the next decade.[xxiv]

The global commitment to nanotechnology is a notable example of increasing global funding for basic research. Over 35 nations now have nanotechnology R&D programs underway. In the United States, the National Nanotechnology Initiative is a multi-agency research and development effort anchored by the National Science Foundation and sixteen other federal agencies to explore the potential of nanotechnology.

5. The United States lags behind other nations in the deployment of broadband networks that are the foundation of the next wave of technology innovation.

Ubiquitous broadband deployment has the potential to further revolutionize significant markets -- including retail, education, home entertainment and medicine -- with potentially enormous benefits.

Yet, the U.S. ranks just 13th in world broadband penetration, lagging behind Korea, Japan, Canada and many of our European competitors, who have adopted national policies and cleared regulation to bring broadband to their communities. World broadband deployment is growing at 78% per year, while U.S. broadband deployment is growing at only 35% per year.[xxv]

Deployment rates alone do not tell the whole picture. For many Americans, broadband connections languish at speeds of a few megabits or less, while consumers in other countries have access to 20, 40 or even 100 megabit connections.

Countries like Japan and Korea understand how broadband can strengthen competitiveness, and they have aggressively deployed it. For example, until recently, Japan lagged behind the U.S. in broadband deployment. In just a few years, Japan has increased the number of homes served by fiber by 500%. 17 million Japanese are now connected at extremely low prices: 100 kilobits of connectivity costs the average U.S. consumer over $3.50 – but the Japanese consumer pays just $.09.

In Asia, perhaps the greatest deployment success story is South Korea. Through a series of government investments and market enabling policy efforts, the South Korean government has successfully stimulated one of the world's highest broadband penetration rates. Seventy percent of South Korea's 24.3 million Internet users log on to broadband networks.[xxvi]

As a result, South Korea is home to vibrant industries in electronic gaming, telecommunications and computing.

Leadership in broadband means the ability to foster cutting edge industries that are powered by next-generation broadband networks. And it means the ability to vastly increase efficiency and productivity. The resulting impact is significantly increased economic growth and rising gross domestic product (GDP) Indeed, several major studies have linked accelerated broadband deployment to a potential multi-billion dollar impact on GDP and the creation of millions of new jobs.[xxvii]

In addition to the economic benefits, broadband promises an enhanced quality of life for citizens and communities, through reduced traffic congestion and pollution resulting from teleworking; improved education systems through technology based initiatives; revitalized urban centers and communities through Wi-Fi hot-spots and broadband-enabled "cyber-districts"; and more efficient and user-friendly government services that enhance participatory democracy.

In short, innovation drives economic growth, job creation and a better quality of life yet America's innovation leadership is under threat. The formula for success is well understood and our foreign competitors are applying it with great effectiveness.

Today, the United States is still the world's technology and innovation leader. Our challenge is to ensure that we maintain our lead. We must continue to invest in the future through policies that are the foundation for growth.

RECOMMENDATIONS: THE INNOVATION POLICY AGENDA

Based on the perspectives and recommendations offered at each of the regional TechNet Innovation Summits, TechNet has developed a policy agenda to strengthen our nation's competitiveness and the Innovation Economy. TechNet's 2005 Innovation Policy Agenda is:

1. Strengthen Education and Develop a Skilled Technology Workforce

Education reform is among TechNet's highest priorities, and we are committed to working with the Administration and Congress to ensure a world-class U.S. education system.

TechNet's efforts have focused on increasing competition and innovation in public schools, high standards, accountability, teacher training and a renewed emphasis on excellence in math and science education. In addition, the technology industries have invested substantially in education and training programs ranging from scholarships to encourage minority students to pursue careers in engineering and computer science to in-house training programs that prepare current employees for the challenges of the future.

TechNet is committed to continuing to work with the Administration and Congress in support of efforts to ensure that all Americans have the tools and skills to compete in the Innovation Economy.

Specifically, TechNet supports:

- Continued implementation and full funding of the No Child Left Behind Act. President Bush and the Congress took a significant step toward improving K-12 education and we must continue to implement and fund this landmark legislation;
- Making science, math, engineering and technology education a national priority by increasing funding for math and science partnerships and by supporting initiatives to improve math and science teaching and student learning;
- Strengthening post-secondary education to achieve an increased yield of domestic higher education degrees in math, science and engineering;
- Ensuring that American workers are prepared for the high-skill jobs of the future through effective retraining for displaced and unemployed U.S. workers;

- Improved business immigration programs to retain the world's best innovators who will create new jobs and companies in the United States. Specifically, TechNet supports efforts to ensure that foreign-born scientist and engineers educated in the United States are able to remain to create technologies, companies and jobs.

Recognizing the technology industry's responsibility to contribute to an improved education system, TechNet has established an Education Task Force of some of the nation's leading CEOs to develop a new private-sector initiative to increase America's math, science and engineering talent. The Task Force will examine science and math preparedness in primary and secondary education as well as barriers to science and engineering degree attainment in postsecondary and graduate education.

Members of the TechNet CEO Education Task Force are: Craig Barrett, CEO, Intel Corporation; Art Coviello, President and CEO, RSA Security; Paul Deninger, Chairman, Broadview - A Jefferies Company; John Doerr, Partner, Kleiner Perkins Caufield & Byers; John Morgridge, Chairman, Cisco Systems, Inc.; Henry Samueli, Chairman and CTO, Broadcom; Stratton Sclavos, President and CEO, VeriSign; Jeff Taylor, Founder, Monster Worldwide; Joe Tucci, President and CEO, EMC Corporation.

2. Maintain the U.S. Entrepreneurial Culture By Preserving Broad-based Employee Stock Options

Broad-based employee stock option plans are a critical factor in driving innovation and motivating Americans to work hard for the chance to own a piece of the corporation. Stock options fuel productivity and economic growth.

Yet, the Financial Accounting Standards Board has issued a standard requiring the expensing of all stock options by June 2005, using valuation methods that significantly overstate the value of options. The impact will be a severe curtailment or elimination of the use of broad-based employee ownership programs as companies face a large and unrealistic impact on their financial statements resulting from expensing.

Mandatory expensing will undermine U.S. efforts to spur innovation. This is not the time to shut down a proven engine of economic growth. TechNet supports:

- A thorough study of the economic impact of the FASB's expensing standard prior to its implementation;
- Implementation guidance that results in realistic valuation methods for employee stock options;
- A thorough program of field-testing to insure the viability of any new standard prior to its implementation.

3. Create Opportunities for Expanded International Trade Beginning with Enactment of the U.S.-Central America-Dominican Republic Free Trade Agreement

Our continued global competitiveness depends on our ability to continue to seek open markets and opportunities for expanded trade for the benefit of our economy, workers, consumers, and industries. On average, over 60 percent of U.S. technology industry revenues are derived from outside the United States. Across industries, a positive U.S. trade agenda that is opening markets, including the emerging markets of the developing world, will be critical.

Specifically, TechNet supports:

- Continued efforts to pursue a free-trade agenda, including moving forward with our WTO goals;
- Pursuit of additional bilateral and regional free trade agreements, opening new markets to U.S. products and services, beginning with early enactment of the U.S.-Central America and Dominican Republic Free Trade Agreement;
- Clearing hurdles that will allow U.S. companies and products to compete effectively around the world;
- Efforts to safeguard intellectual property through trademark, copyright and patent protections as well as enhanced enforcement provisions.

The U.S.-Central America and Dominican Republic Free Trade Agreement (CAFTA-DR) is among our most important near-term trade priorities. This Agreement will expand markets and create export opportunities for U.S. technology products and services that are essential to the continued global leadership of America's technology industries.

Unlike any other free trade agreement in which the United States has entered, the vast majority of industrial and agricultural goods from the CAFTA-DR countries already enter the U.S. duty-free as a result of unilateral preference programs that Congress has overwhelmingly supported for decades. The CAFTA-DR will open up the markets in Central America and the Dominican Republic to American goods and services, for the benefit of the technology sector and other U.S. industries.

The CAFTA-DR is also an important precedent that confirms the U.S. commitment to building strong economic alliances with our neighbors in the Western Hemisphere and developing nations around the world.

4. Promote Accelerated Broadband Deployment and Demand

Broadband is the foundation for continued technological and economic leadership. The development of a ubiquitous, next generation broadband network represents a fundamental pillar of the innovation economy. Broadband is a platform for new industries and jobs. It means improved productivity and quality of life. It can revolutionize fields as diverse as healthcare, the workplace and education.

And it can make industry and government more efficient.

It is critical that the United States show leadership in clearing roadblocks to broadband deployment and adopting innovative policies to foster demand. TechNet is committed to working with policymakers as they update the Telecommunications Act of 1996 to adopt public policies that remove barriers to broadband deployment and spur exciting new applications and services.

Specifically, TechNet urges Congress and the Administration to:

- Continue to reduce regulatory burdens and uncertainty that impede or delay the deployment of broadband networks through technology-neutral reforms;
- Exercise regulatory restraint with respect to emerging broadband applications and services including Voice over Internet Protocol communications;
- Drive adoption of broadband through e-government initiatives, and policies that encourage broadband demand;
- Continue to reject technology mandates in favor of industry efforts to develop market solutions that spur the availability of music, high-definition video and movies via the Internet;
- Continue efforts to modernize U.S. spectrum policy and increase spectrum availability and efficiency, including increasing unlicensed spectrum;
- Encourage broadband deployment to underserved communities and businesses through investment incentives, where necessary.

5. Promote Private Sector Initiatives to Improve Cyber Security

Since the advent of the World Wide Web in the early 1990s, the Internet has developed into a global network supporting communications, operations, and commerce. America invented the Internet, and American enterprise has led its commercialization and use, fueling new industries, including networking, e-commerce, web, and information security enterprises. The vitality and security of the information infrastructure is essential to America's continued global technological leadership.

We urge the Administration and Congress to support voluntary, private-sector initiatives that enhance the security of the nation's information infrastructure and to refrain from imposing regulation which would stifle innovation and create a false sense of security.

With over 80 percent of the Internet infrastructure operated by the private sector, protecting our enterprise systems is not only a practical safeguard against business losses; it is key to our national competitiveness.

Regulatory mandates – requiring adherence to a government-defined set of security criteria -- could be harmful and even dangerous. Security needs vary according to specific situations and users. Also, technology evolves rapidly; any codification of security

measures would be quickly rendered obsolete by advances in both attack methods and new security technologies. Organizations must be afforded maximum flexibility to assess their own risks and adapt to a changing environment. Regulation would also divert corporate resources from implementing improvements to demonstrating compliance.

TechNet has taken a leadership role in promoting voluntary, private sector initiatives to improve cyber security. In 2002, TechNet's CEO Cyber Security Task Force developed an initiative challenging corporate CEOs to review and improve their own company's security posture. The centerpiece of this effort is the TechNet Corporate Information Security Evaluation for CEOs – an online assessment and educational tool for CEOs. In addition, as a founding member of the National Cyber Security Partnership, TechNet sponsored the December 2003 National Cyber Security Summit and managed the development of recommendations reports addressing information security governance and technical standards and common criteria.

Given the importance of cyber security to our nation's critical infrastructures, TechNet strongly advocates the creation of an Assistant Secretary for Cyber Security within the Department of Homeland Security and supports the "Department of Homeland Security Cybersecurity Enhancement Act," H.R. 285.

Throughout 2005, TechNet will continue to lead industry efforts to enhance cyber security and support the Administration and Congress in efforts to protect the nation's information infrastructure.

6. Increase Federal Funding for Basic Research at Key Agencies and Enact a Permanent Extension of the R&D Tax Credit

The United States can only continue our innovation leadership by strengthening our national investment in research and development and next-generation technologies. A sustained public and private investment in R&D will foster a skilled American workforce, stimulate new technologies and maintain U.S. dominance in vital industries -- elements critical to retaining the United States' global economic leadership.

As the only federal agency dedicated to fundamental research across a range of scientific disciplines, the National Science Foundation's budget should be a top priority. NSF-supported basic research has led to advances that have fueled the growth of America's economy. NSF also plays a central role in developing a skilled workforce and the next generation of technology innovators through support for programs and basic research at our nation's academic institutions.

Primary among these is Stem Talent Expansion (STEP) or Tech Talent program, designed to address the alarming shortfall in the number of American students graduating from college with degrees in science, mathematics, engineering and computer science. The Tech Talent Program aims to reverse this trend and ensure an adequate supply of qualified domestic workers to fuel technological innovation and economic growth.

A strong federal commitment to funding basic research in science and engineering is critical to the long-term competitiveness of the technology industry and our nation's economy. TechNet urges Congress and the Administration to:

- Achieve increased appropriations for the basic research functions of the National Science Foundation consistent with the National Science Foundation Authorization Act of 2002, which authorized funding totals that would double the agency's budget by FY 2007;
- Support sufficient funds within the NSF budget for the Tech Talent Program, math and science partnerships program and other programs to strengthen America's technology leadership;
- Identify and act on other opportunities to support basic research and math, science or engineering education;
- Enact a permanent extension of the R&D Tax Credit to spur increased private sector research and development.

7. Pursue Legal Reform Initiatives That End Frivolous Lawsuits

President Bush and the Congress took a major step toward improving our nation's legal system by enacting the Class Action Fairness Act in February 2005. This legislation will facilitate removal of class action cases from state to federal court, ensuring a more balanced resolution to major, national class action lawsuits. The Act also includes important protections to ensure that class action settlements are fair to plaintiffs.

TechNet's support for the Class Action Fairness Act extends a leadership role in fighting abusive lawsuits that began with the defeat of California Proposition 211 in 1996. Since then, TechNet has made legal reform a top priority.

Frivolous litigation costs the U.S. economy $200 billion a year and is a tremendous drain on resources that should be focused on innovation, not on meritless lawsuits. TechNet will continue to champion legal reform initiatives that strengthen our nation's global competitiveness and technology leadership.

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TECHNET REGIONAL INNOVATION SUMMITS

- **2004 TechNet Texas Innovation Forum, September 8, 2004, Dallas, Texas**

The first in the series of innovation summits, the TechNet Texas Innovation Forum featured a keynote address by Governor Rick Perry, and CEO presentations showcasing breakthroughs in nanotechnology, biotechnology and wireless. Policy recommendations highlighted support for research and development; mathematics, engineering and science education and public/private partnerships to spur innovation. The event was hosted by The University of Texas at Dallas.

- **2004 TechNet New England Innovation Forum, October 13, 2004, Boston, Massachusetts**

TechNet and the MIT Deshpande Center for Technological Innovation joined forces to highlight innovation in New England and the nation. Leading CEOs, policymakers and academics explored the region's innovation potential and the region's growing leadership in the nanotechnology, Internet and cyber security industries. Participants included Jeff Taylor, Founder of Monster Worldwide and Ranch Kimball, Massachusetts Secretary of Economic Development.

- **2004 TechNet Southern California Innovation Summit, November 11, 2004, Irvine, California**

TechNet Southern California members and leading experts discussed key public policy challenges that threaten the ability of the technology industry to remain innovative and competitive in a global economy. The keynote speaker, Dick Grannis, Senior Vice President and Treasurer of QUALCOMM, focused on the effect of stock options expensing on growth companies. Rounding out the discussion were speakers from diverse perspectives: a major Orange County venture capital firm; a small, recently public information technology firm; and national accounting and law firms. Among the topics that generated the most discussion was the impact of Sarbanes-Oxley implementation on existing and emerging technology leaders.

- **TechNet National Innovation Summit, November 15, 2004, Mountain View, California**

Leading visionaries including TechNet founders John Chambers and John Doerr, as well as Carly Fiorina, Eric Schmidt, Terry Semel, Paul Otellini and Jeff Taylor headlined the TechNet National Innovation Summit, exploring emerging technologies and the critical issues driving innovation and competition. Renowned journalist Charlie Rose conducted the interviews and broadcast the TechNet National Innovation Summit on his nationally broadcast PBS program. The event was held in partnership with Stanford University and hosted by Google, Inc.

- **2004 Technology Innovation Forum, December 1, 2004, Seattle, Washington**

TechNet, in partnership with the TechAlliance and the University of Washington, explored next generation trends in the e-tailing, wireless and biotech industries. Keynote speakers John Stanton, Chairman, Western Wireless Corporation and Jim Allchin, Group Vice President and Member of Microsoft's Senior Leadership Team, joined academic, policy and industry visionaries including Senator Maria Cantwell, Rep. Adam Smith, and Dr. Mark Emmert, President of the University of Washington.

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About TechNet:

TechNet is the bipartisan, political network of CEOs that promotes the growth of technology and the innovation economy. TechNet focuses on politics and policy by uniting its members and policy makers to sustain and advance America's global leadership in innovation. Headquartered in Silicon Valley, TechNet also operates offices in the high-tech centers of Southern California, New England, Texas and the Pacific Northwest. TechNet's members represent more than one million employees in the fields of information technology, biotechnology, e-commerce and finance.
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