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It is an honor to be here today, and to spend part of the day among people whose lives and work are defined by innovation, entrepreneurship and collaboration. There has never been a time when those qualities are in greater demand in America and the world.

We are, indeed, operating in a new economy today – one that has its roots in the industrial and information ages, but that is dramatically and fundamentally different. This new era of global competition is marked by an unprecedented level of interconnectedness among individuals, businesses and nations… connectedness that extends beyond telecommunications and the internet.

In many industries we find ourselves in a truly global workplace, unconstrained by time zones, language, physical proximity or traditional corporate boundaries. Our competitors are no longer far removed from us—no matter what their geographic location.

Success in this new economy will depend on our ability to lead in innovation. The Council on Competitiveness, in its recent report "Innovate America," says innovation is the single most important factor in determining America's success through the 21st century. The Council noted, "For the past 25 years we have optimized our organizations for efficiency and quality. Over the next quarter century we must optimize our entire society for innovation."

We must nurture and encourage innovation by creating a supportive environment for individuals and enterprises that have the potential to lead the next generation of knowledge creation. This must be done at the K-12 level, higher education, in our tax and regulatory systems—in short, in all facets of our lives. And that depends on cooperation among government, education, and the private sector.

Your presence at this conference, and your involvement with the Small Business Innovation Research program, are encouraging evidence that there is a wealth of potential. We must ensure that investment, infrastructure and intellectual resources are "optimized for innovation."

Today, alarm bells are sounding from many different corners on the future competitiveness of the American economy. We still hold a position of leadership in this new

global economy, but as Peter Drucker said, "the *dominance* of the U.S. is already over." The United States cannot be complacent. If we are content with our historical world leadership and our current position as the world's only true superpower, we won't see how quickly others are catching up with us.

India, China and Russia are all on our heels. Drucker notes that India has 150 million people for whom English is their main language, and the technical graduates of the Institute of Technology in Bangalore are as good as any in the world.

John Harker, chairman of the board of the American Electronics Association, likened the United States to "the proverbial frog in the pot of water, oblivious to the slowly rising temperature." And his association's 2005 report, "Losing the Competitive Advantage?" reminds us, "America needs to recognize that future innovation is not predetermined to occur in the United States. Even if we were doing everything right, we still face unprecedented competition from abroad."

In this new era of technology, with knowledge advancing at an unprecedented pace, the technological growth of other nations is dramatic. Much of that growth is based on the rapid diffusion of knowledge that originated in the United States. As a result, other nations are able to "leapfrog" into the global economy without having to invest in technology development.

Telecommunications presents a classic example. In the United States, we have a 129-year investment in the progressive infrastructure of telephone communications – from copper-based wires on telephone poles to satellites to cell towers. Other countries could not afford to make telephone communications widely available until lower-cost cellular technology was available, but now have systems far superior to ours, with greater penetration.

Our competitors have been able to bypass infrastructure costs and instead invest more heavily in education and innovation. China today graduates nearly four times as many engineers as the United States, Japan twice as many, and South Korea – with a population one-sixth the size of ours – graduates almost the same number.

Many foreign nations are not only creating world-class educational programs, they are actively seeking to lure talented native-born scientists and engineers back from the U.S. after they complete their education. Meanwhile, restrictive immigration policies instituted in the US after 9/11 have made it more difficult for foreign nationals to come here, or remain here to work.

Today, one out of five scientists and engineers in the United States are foreign born, and a significantly higher percentage of the graduate students in our nation's universities science, math, and engineering programs are foreign nationals. We are at risk of losing their intellectual contributions to our educational institutions and our economy—and that is a serious problem.

The dominance of the U.S. scientific community is slipping, as evidenced by the decline in the percent of patents issued to US corporations, the decline in U.S.-originated scientific articles in academic journals relative to other countries and the relatively slow growth in the number of doctoral degrees in science and engineering. Even more alarming is the decline in federal funding for research and development. U.S. federal funding of R & D, as a percent of gross domestic product, actually peaked in the mid 1980s.

Today's highly competitive global economy presents unique challenges to each of us – to you, as entrepreneurs, inventors and business people, and the folks who support their work; to our government as we seek to maintain our leadership and economic power; and to those of us in education, striving to provide relevant preparation for our students for the 21st century, an optimum climate for researchers, and the outreach needed to help businesses be competitive.

It is a challenging time, but it is also an exciting time. The wake-up call has gone out, and I think we know what we must do. We must increase our talent pool, and we must increase our investment in research and development, and we must provide an environment when innovation thrives. Today, I'm going to focus primarily on the first of these imperatives.

Increasing the talent pool is a long-term strategy that starts with our children. You may have read the comments that Bill Gates made at the National Education Summit last month, suggesting that America's high schools are obsolete and unable to teach our kids what they need to know to succeed in the future.

In its report "Crisis at the Core," ACT found that only 26 percent of ACT-tested high school graduates were academically prepared for an entry level college course in biology. The numbers for African American and Hispanic students were much lower. And in 2002, the National Center for Education Statistics reported that only 21 percent of high school sophomores were proficient at mathematics beyond simple problem-solving – and fewer than 50 percent were even proficient at that level.

Somewhere between 4th grade – where U.S. students score in the top percentile in math and science compared to their international counterparts – and 12th grade, where they score at the bottom, we are losing our future scientists and engineers.

Increasing competitiveness will depend not only on educating students, but in educating them in the right fields. We need to create new incentives to encourage students to pursue careers in math, science and engineering so that we can adequately support the innovation economy. In 2002, only 5.5 percent of high school seniors who took the college entrance exam planned to pursue an engineering degree.

Globally, we lag behind several other countries, including Japan, Singapore, South Korea and Australia, in the number of science and engineering graduates and that number is declining. We have dropped to 17th worldwide in the proportion of the college-age population earning science and engineering degrees. At the same time, retirements from these fields are increasing rapidly as the baby boomers hit age 60.

We must increase the emphasis on science and math in our grade schools, middle schools and high schools, and ensure that there is an integrated curriculum so that each year builds the knowledge needed for the next. We don't stand a chance of providing enough math, science and engineering graduates from our universities if we don't make significant changes in what we're doing in K-12.

In addition to increasing the proficiency of high school students, we need to encourage more of them to go on to college – with special emphasis on underrepresented minorities. Nationally, both the college-going rate and the college completion rate among the rapidly growing Latino population are much lower than for the white, non-Latino population.

Increasing the talent pool requires much more than just convincing students to go on to college. There are a number of steps we can take in higher education as well – including:

- stronger efforts to create a culture of entrepreneurship, invention and innovation at the student level;
- recognizing and rewarding innovative research conducted by our faculty, especially multidisciplinary efforts;
- encouraging faculty-student collaboration;
- increasing access to college for low-income students;
- welcoming foreign students into our institutions; and

- bringing the business community more actively into the picture.

Partnerships between business and higher education have already proven to be an effective strategy. When we created the Peter Kiewit Institute, a joint program of the University of Nebraska at Omaha and the University of Nebraska-Lincoln, business leaders in computer technology and engineering helped design a curriculum to prepare students for careers in their industry. More recently, an architectural engineering program was added at the urging of business leaders, specifically to prepare graduates in this emerging field. Learning experiences that bridge the gap between research and application are invaluable for our students.

SBIR, of course, offers many examples of public/private partnerships that have succeeded in encouraging innovation. Here in Nebraska, the J.A. Woollam Company was spun off from the University of Nebraska in 1987. The company specializes in the design and manufacturing of optics instruments for use in both defense and commercial industries and now holds more than 40 patents. Department of Defense funding through SBIR helped the Woollam Company successfully commercialize this technology.

Again, according to the National Innovation Institute Initiative, "Publicly financed research has been the bedrock of American innovation. … For America to maintain its global leadership in innovation, the nation must revitalize its research efforts at the frontiers." Enhanced federal research funding overall, which in turn would allow the expansion of SBIR/STTR programs, is necessary. Seventy-five percent of all innovations come from small businesses – and we need to promote research and technology transfer at all levels.

The federal government, as well as state governments, must make strategic investments to leverage America's technology and science assets. Tax incentives, targeted investment in emerging technologies, innovative partnerships between government, business and higher education, increases in early stage risk capital, support of entrepreneurship and above all investment in human capital will provide the fuel for innovation research.

Economic competitiveness has been compared to an ecosystem that can only flourish when the essential ingredients of opportunity, innovation, R&D investment, and capital are in abundance and in balance. For America to remain competitive, this is essential

Thank you for your commitment to these goals, for the work that you're doing, and for being a part of this important conference.