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I am pleased to have this opportunity to encourage an important industry at an important time in its development. The participation in this forum of so many leaders from both business and government testifies to the powerful role of information technology in our economy – indeed in our way of life.

Information and communications technology, or ICT, has from its inception been closely entwined with developments in basic science. Only the much younger field of biotechnology has depended as strongly upon its underlying science for continued growth and vitality.

It is worth recalling that Samuel F.B. Morse, a famous artist, received the first patent for using electricity for signaling in 1838. This is remarkably soon after the Danish physicist Hans Oersted first noticed the deflection of a compass needle by an electric current. Within months of Oersted's announcement, Ampere had completely worked out the mathematics of it. From that point, electrical discovery and electrical applications rushed, hand in hand, at breakneck speed throughout the 19th century. Practical wireless communications technology began with Marconi's experiments in 1895, just a few years after Heinrich Hertz first observed electromagnetic waves in a series of experiments in Germany. Hertz and his predecessors, notably James Clerk Maxwell, were "basic scientists." Marconi and his successors, including Germany's Karl Braun with whom he shared the 1909 Nobel Prize in physics, were engineer-entrepreneurs. Both started companies based on technology patents, Marconi's in Britain where the British Ministry of Posts also supported his experiments. Braun's company, a consortium including Siemens, became Telefunken. Marconi's spawned RCA through one of its executives, David Sarnoff. The entire early history of telegraphy and radio in America and Europe shows a tight link between discovery and invention, and a rate of progress that is not less impressive than today's breakneck development cycle.

Who could have guessed that Marconi's crude apparatus would lead to the exploitation of so much of the electromagnetic spectrum through the technologies and wireless voice and data communications systems used by businesses, consumers and government today? There are now over 140 million wireless phone customers and, increasingly, businesses and consumers are installing systems that use unlicensed spectrum to allow wireless data communications, called Wireless Fidelity, or WiFi. Wireless communications are critical not only for commercial purposes, but indispensable for first responders – police, fire, and medical workers – to cope effectively with natural disasters or terrorist attacks, and essential to the complex missions of modern national security.

The United States government takes these lessons of history very seriously. This Administration understands that research is the engine that drives technology, and that technology in turn drives capabilities throughout the economy. Technology is the basis for innovation, and innovation is the basis of economic vitality. This administration also understands that long lead time, high risk basic research is the responsibility of government. Shorter term research and development, and the transformation of scientific discoveries into products, is the task of the private sector. Above all, however, it is the existence of a capable, hardworking citizenry that makes the whole machinery function. Our nation was conceived in the dawn of the industrial revolution, and our founding fathers shared an optimism about the power of individual creativity. U.S. philosophy rests on the belief that entrepreneurs – like Morse, and Bell, and Edison, and Sarnoff – whether motivated by altruistic concerns, or personal ambition, or return on investment, are the ultimate source of economic strength.

How is our administration implementing this grand vision? The President's budget request for FY 2004, not yet implemented by Congress, advances federal R&D funding beyond \$120 billion, the largest in history. The total federal R&D budget will have grown 34% under President Bush's leadership in the new millennium, an increase from \$91 billion in 2001. U.S. Federal Government R&D now exceeds that of all the G-8 countries combined. Of the more than \$110 billion of total federally funded R&D dollars spent in 2003, 31% supported federal laboratories; 29% supported large businesses (mostly for the "D" in R&D); 25% went to universities and colleges; 9% to small businesses; and 6% to non-profits.

These funds are expended through more than twenty federal agencies that work together under my office, the White House Office of Science and Technology Policy, to develop coordinated programs that address society's needs and seize opportunities for new discoveries. An important example of interagency cooperation is the multi-agency Networking and Information technology R&D program (NITRD), a national S&T priority. This effort covers R&D activities in 12 agencies in all aspects of large scale and broadband networking, advanced computing, software, and information management technologies. In the President's 2004 budget, NITRD grew by \$411 million, a 23% increase since 2001, bringing the overall annual investment to \$2.2 billion in this mature, but still critically important area.

What do such programs produce? One example is the Globus Toolkit, an open source infrastructure to support grid computing – the sharing and collaborative use of high-end computers, networks, databases, and scientific instruments by distributed users. This is a product of research funded by NSF, the Defense Advanced Research Projects Agency, the Department of Energy, and NASA. Many of today's largest technology companies, including IBM, Hewlett-Packard, Sun Microsystems, Silicon Graphics Inc., Oracle Corp., and numerous others, are using this toolkit in support of their commercial grid computing efforts. This technology provides an excellent example of technology transfer from research jointly done at National Labs and at universities and funded through federal R&D Programs.

In a further effort to encourage the transfer and exploitation of new technology, the President has proposed an increase in the Patent and Trademark Office's operational budget by \$230 million (20%) in 2004, to a total of \$1.4 billion, in order to protect American intellectual property, inventions and discoveries more effectively, and more quickly. This increase will improve the quality of patents issued to enhance legal protection and shorten the time it takes to get a patent, spurring private investment in R&D.

I cannot do justice in the time we have tonight to the multitude of programs encompassed by the federal investment in science and technology related to your fields. Fortunately, one of the significant products of that investment, the Internet, contains all you want to know. And you can scan it efficiently with the magnificent search engines created not by government, but by private initiatives.

Economic activity in the technology sector is slower than it was during the wild years of the 90's, but the foundations for continued growth are well laid. We are now poised at the threshold of yet another vista, discernable only in outline, but rich with promise. The Wall Street Journal reported last October that “despite three technology slumps in the past quarter century, the technology sector has come back. While products and companies may die, innovations and improvements to existing products brought the industry back to life.” Opportunities like those perceived by Marconi and Sarnoff exist today. With thoughtful cultivation, continued targeted investment, and attention to the fundamentals, they can be developed. I look forward to working with you and your colleagues on behalf of this Administration to reap the rewards of past investment in the science and engineering of information technology, and to prepare the way for future generations of successful entrepreneurs.