

Technology Leadership and Strategy Initiative

2009-2011

Overview & Key Recommendations



Compete.

Council on
Competitiveness

Setting the Stage

Private sector leaders formed the Council on Competitiveness in the mid-1980s in response to Japan posing the first real challenge to America's economic leadership since the end of World War II. Technology, trade, and market access in sectors like semiconductors, supercomputers, satellites and electronics played a significant role in the competition, alongside concerns about product quality management.

Shortly thereafter, the end of the Cold War and the dawn of the Internet age shifted the competitiveness landscape again. Countries moved toward more open market-based economies. Several forms of work could be done remotely. Firms began to distribute economic assets and activities across the globe where they would be most competitive.

In this increasingly competitive world, the Council was among the first to recognize that the capacity to innovate and commercialize technology differentiates national and regional economies. The Council published in 2001 *Clusters of Innovation: Regional Foundations of U.S. Competitiveness*. This groundbreaking report and initiative offered a framework to evaluate regional cluster development and innovation performance, setting off an explosion of activity to foster innovation across America and throughout the world.

Nations copied—and in some cases built on—the U.S. innovation model, investing in talent, research, and high technology infrastructure. Political leaders and economic development officials worldwide still seek to build and strengthen innovation clusters that attract investment and generate high margin companies around new technologies.

Other Council initiatives:

- Supplied tools for building innovation-led regional economies;
- Illustrated success through case studies; and
- Explained how regions can engage business leaders and map their assets.

The Council also pioneered the country's innovation movement, starting with the first-ever National Innovation Summit at MIT in 1998 and followed by a major, CEO-led National Innovation Initiative in 2003-2005. The resulting *Innovate America* report explained how innovation was changing, outlined its central role in competitiveness, and put forth a national agenda that culminated in the America COMPETES legislation.

New management strategies, better public policies, and new forms of collaboration are needed to compete in technology markets that offer short windows for growth and rapid rates of obsolescence.

In 2009, the Technology Leadership and Strategy Initiative (TLSI) strode into this ever-evolving fray defined by new challenges. In the wake of a recession and growing U.S. fiscal imbalances, federal investment in basic research is under intense pressure as enterprises struggle to find and develop the talent they need, and to react strategically to rapidly evolving and globally diffuse technology advances.

America's economic and security interests require new management strategies, better public policies, and new forms of collaboration between the principal stakeholders—industry, government, universities, national laboratories and the risk capital community. Corporations that operate global research functions report that many educational and research institutions outside the United States offer more favorable terms to collaborate and innovate. Defense, intelligence, and homeland security officials realize that best-of-breed technologies critical to their missions are often developed by the private sector—often outside the United States.

For the past three years, the TLSI has helped to understand these changes, challenges, and opportunities—and to suggest ways to strengthen America's technology leadership. The United States needs a senior technology leadership group to articulate priorities and offer an informed voice. By convening corporate chief technology officers with their peers at top research universities and the national laboratories, the TLSI has emerged as a proven national asset to America's public sector leaders who have regularly engaged in twice-yearly TLSI Dialogues.

Elements of the TLSI

The TLSI has conducted its work through several channels:

1. **A twice-yearly progressive dialogue series from 2009 to 2012.** The Council has engaged TLSI members and outside participants from industry, academia, the national laboratories and the public sector in a series of progressive dialogues, each building on the results and findings of the preceding session. The dialogues are the foundation of the TLSI, bringing together America's senior technology leaders. Linked to each dialogue is a special report that disseminates a set of provocations, findings, and insights about innovation competitiveness. The reports also capture the content of the discussions.
2. **A CTO survey** to tap the insights and experiences of almost 150 technology and research thought leaders, including the TLSI membership. The survey asked a series of 32 questions to understand the changing landscape of global innovation and how various innovation stakeholders should collaborate and co-invest in America's future. The findings were made available to all TLSI members, participants, and supporters.
3. **A State of Innovation Summit**, partnering with Seed Media Group. The Summit gathered the members of the TLSI and other C-suite luminaries and thought leaders to explore how science, technology and innovation are re-drawing the business landscape of the 21st century.

Speakers included Chad Holliday, then chairman of DuPont; Wayne Clough, secretary of the Smithsonian Institution; and George Campbell, then president of the Cooper Union for the Advancement of Science and Art. The summit also brought together prominent thinkers such as two-time Pulitzer Prize winning Harvard biologist E.O. Wilson and David Shaw, a noted computational biochemist and hedge fund manager from Columbia University who serves on the President's Council of Advisors on Science and Technology. Claudia Kotchka, former vice president for design innovation and strategy for Procter & Gamble, and Julie Lasky, editor of the publication *Change Observer*, spoke of the role of design in innovation. Cory Ondrejka, a founder and former CTO of Second Life, shared his insights on the business of managing innovation.

Goals of the TLSI

- To convene technology leaders from America's premier companies, universities, and national laboratories to understand technology investment drivers and strategies.
 - To establish a new paradigm for collaboration between the public and private sectors to optimize America's investments in research, talent and technology.
 - To identify critical technology and policy roadmaps to assure that the United States sustains the innovation and technology advantage required for national security and economic competitiveness.
4. **TLSI Working Groups** that came together nearly two dozen times between September 2010 and October 2011. The working groups put forward recommendations that would: accelerate innovation at labs and universities, reform key policies and regulations, strengthen education and training, extend the benefits of high performance computing, and educate policymakers and the public about the value of innovation. Several of the recommendations have already been acted upon.

5. Partnerships with the Council's High Performance Computing Advisory Committee (HPCAC) and U.S. Manufacturing Competitiveness Initiative (USMCI).

The TLSI complements and is strengthened by two key Council efforts, the USMCI and the HPCAC. The linkages between the TLSI and the USMCI became apparent almost immediately. Product, process, and service innovation that lie at the heart of manufacturing competitiveness are associated directly with the research and technology agenda pursued by the TLSI. USMCI participants also noted that production insights fuel research agendas. Manufacturers account for almost 70 percent of all U.S. domestic research and development spending by companies. Furthermore, the Council asserts that in order to capture the maximum economic benefit from federal research investment, the nation cannot follow an "invent here, produce there" strategy.

As a result, the co-chairs of the TLSI agreed to serve as the "technology think tank" of the USMCI and to integrate its ideas into the recommendations of the USMCI. TLSI participants joined and even hosted some of the "Out of the Blue" Dialogues of the USMCI around the country to generate ideas and build a larger national coalition around the innovation and production challenges faced by the United States.

The HPCAC aims to facilitate wider use of high performance computing across the private sector, conferring competitive advantages through activities such as modeling, simulation, and discovery. The initiative also seeks to ensure that the United States leads in the development of exascale computing. TLSI participants include several national leaders in HPC. In early TLSI Dialogues it became clear that leadership in HPC technologies and applications have important implications for work on climate research, drug development, oil and gas discovery, defense and aerospace advances, industrial design, and financial forecasting. For these reasons, TLSI participants are briefed regularly at the Dialogues by HPCAC leaders, and the HPCAC agreed to submit recommendations as a TLSI working group.

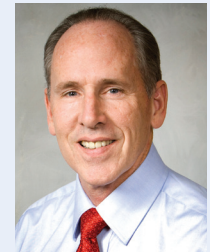
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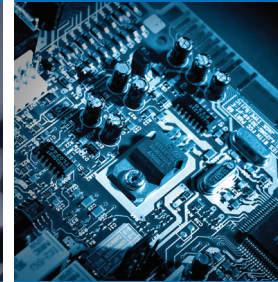

Results

The TLSI has built a powerful coalition of the nation's top technology leaders. It has ignited a robust national conversation and identified public policies and private practices that would improve the speed and volume of technologies that move from lab to market, including technologies utilized to achieve government missions. The TLSI also has identified several grand challenges and strategic technologies that could help solve them.

On the policy front, the TLSI has contributed directly or indirectly to reform efforts on topics such as intellectual property, export controls, basic research, community colleges, manufacturing, immigration, STEM education, and high performance computing. The TLSI's engagement with the U.S. Department of Energy played a direct role in the department's effort to boost corporate collaboration with the national laboratories through the Agreements for Commercializing Technology (ACT). The ACT initiative was announced at the Council's National Manufacturing Competitiveness Summit in 2011.

Spurred by TLSI Dialogues and reports, participants have spread the initiative's ideas to other coalitions and advisory bodies, testified before Congress, and reached out through the media and conferences. The Council, too, has ensured that its membership and broad national networks are aware of the TLSI's intellectual contributions.

TLSI Key Recommendations

Accelerating Innovation	Regulation / Policy	Talent	Innovation Outreach	High Performance Computing
				
<ol style="list-style-type: none"> 1. Define shared outcomes that motivate and coalesce teams. 2. Build communities of commercialization and entrepreneurialism. 3. Facilitate greater sharing of IP. 4. Create innovation-friendly policy environment. 5. Bridge gaps in the innovation-to-market pipeline. 	<ol style="list-style-type: none"> 1. Reform ITAR rules. 2. Retain highly-skilled immigrants educated in the United States. 3. Streamline and modernize the patent process. 4. Remove conflicts in regulations impacting research enterprise (IRS, ITAR, NSF, etc.). 	<ol style="list-style-type: none"> 1. Identify best community college practices and create model curriculums. 2. Expand training in the use of modeling and simulation. 3. Incentivize coop and internship programs for mature workers. 4. Create partnerships between stakeholders to establish these programs. 	<ol style="list-style-type: none"> 1. Develop messaging and reach out to target federal and state officials. 2. Create science and technology advisory boards for long-term policymaker education. 3. Promote programs that inspire students to pursue STEM and entrepreneurship. 4. Leverage advisory boards to speak with targeted media. 	<ol style="list-style-type: none"> 1. Expand business access to HPC. 2. Collaborate and compete globally to have best-of-breed capabilities. 3. Train more computer scientists. 4. Build exascale machine (1,000x faster) by end of decade.
<div style="text-align: center;">  <p>TLSI Working Groups</p> </div>				

TLSI Timeline

CTO Survey

The Council on Competitiveness conducted, with "Seed Magazine," its first-ever CTO survey, tapping the insights and experiences of almost 150 technology and research thought leaders.

MAY

Dialogue 2: Examining Further the Changing Landscape for Global Competitiveness and Exploring New Frontiers

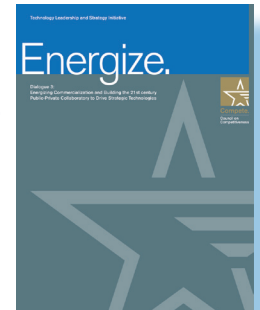
What are some of the most pressing grand challenges facing the United States, and how might innovation and technology be applied to more effectively address them?



NOVEMBER 9

Dialogue 3: Energizing Commercialization and Building the 21st Century Public-Private Collaboratory to Drive Strategic Technologies

What roles do industry, government, and universities play in the U.S. research enterprise and how might those entities interact more effectively?



JUNE 24

2009

2010

JUNE 22

Dialogue 1: The Changing Global Landscape for Technology Leadership

In a world of global science and research networks, how do countries capture competitive advantage from investments and advances in science and technology?



JUNE 23

The State of Innovation Summit: Moving Beyond Lab and Boardroom

The Council organized a private-sector funded, one-day conference on June 23, 2009, in conjunction with TLSI Dialogue 1. The Summit explored how science, technology, and innovation are re-drawing the business landscape of the 21st century.

NOVEMBER 5

Dialogue 4: Preliminary Findings and Recommendations from the TLSI Working Groups

What are some of the priority actions that could increase public-private collaboration, and improve the speed and volume of inventions that are successfully commercialized?



Dialogue 5: Ensuring U.S. Leadership in Strategic Technologies

How can the United States improve decision making across the federal research enterprise and how well does the nation take action to lead in strategic technologies?



JULY 14

Dialogue 7: Reforming the American Innovation System for a New Century of Leadership

What are the emerging challenges and great opportunities Americans should pursue? How should innovation stakeholders adapt our practices to remain competitive?



JUNE 28

2011

2012

OCTOBER 24

Dialogue 6: Changing the U.S. Innovation Landscape—the Path from Words to Deeds

What is happening in the policy arena that is relevant for the TLSI and how should the Council on Competitiveness work in 2012 toward implementing TLSI recommendations?



OCTOBER 22

Dialogue 8: New Collaboration Dynamics at Home and Abroad

How is the link between research and manufacturing evolving? Which new methods are emerging to access innovation and talent? How are regions tapping into global networks of expertise?



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