The Center of Innovation: Creating an "Innovation Ecosystem" Driven by Public-Private Partnerships for the Benefit of the Homeland Security Enterprise

Randel L. Zeller
Director, Interagency Office
Science & Technology Directorate
U.S. Department of Homeland Security

Terry C. Pierce
Director, Center of Innovation
Science & Technology Directorate
U.S. Department of Homeland Security

Thomas A. Cellucci
Director (Acting), R&D Partnerships Group
Science & Technology Directorate
U.S. Department of Homeland Security

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Department of Homeland Security Science and Technology Center of Innovation: Creating an "Innovation Ecosystem" Driven by Public-Private Partnerships for the Benefit of the Homeland Security Enterprise

Randel L. Zeller, Terry C. Pierce, and Thomas A. Cellucci of the U.S. Department of Homeland Security: Science and Technology Directorate, Washington, D.C.

The United States Air Force Academy (USAFA) Center of Innovation (CoI), which is managed by the Department of Homeland Security Science and Technology Directorate (DHS S&T), is designed to create novel capabilities from emerging industry research technologies that eventually enable Commercial Off-The-Shelf (COTS) products. Located at the United States Air Force Academy (USAFA) and near U.S. Northern Command, the CoI leverages the Academy's state-of-the-art supercomputer and millennial generation cadets to create a truly interagency center. The CoI, the result of a collaborative agreement between USAFA and DHS S&T, has enabled the federal government to conduct cooperative research with private industry technology companies like Intel Corporation.

The CoI has had several major successes:

In July 2009, the CoI conducted the *USAFA Mission Fabric Collaboration Experiment*, co-sponsored by the Human Factors and Infrastructure Protection and Disaster Management Divisions for DHS S&T, as well as Department of Defense (Rapid Technology Fielding) to evaluate the impact of cutting-edge technology on distributed collaboration. The experiment participants included members from DHS's Customs and Border Patrol Air/Marine Operations Center, multiple U.S. warfighting commands as well as academic institutions including USAFA cadets.

In December 2010, USAFA signed a unique cooperative agreement for research with Intel Corporation, on behalf of the CoI. This significant achievement established an innovative public-private partnerships model in the Federal government. The CoI is pursuing additional agreements with Cisco Systems and IBM for DHS S&T. The combinations of these three market-shaping organizations represent over $20 billion in corporate Research and Development (R&D) annually. The CoI is funding service academy cadets to perform research with Intel Corporation and the IBM Watson Research Center related to closing DHS capability gaps.

In March 2011, the CoI initiated several iterations in its Rare Event Scenario (RES) Framework. The first experiment is being played in a 2-D space, and will serve as a baseline for future iterations, which will be played in 3-D virtual environments. The RES Field testing will include several more games through December 2011. Future RESs will also field test private sector partner research technologies in creating a new, layered cyber security model called Flexible Distributed Security (FDS).

The Current Public/Private Cyber-Space Partnership Model:

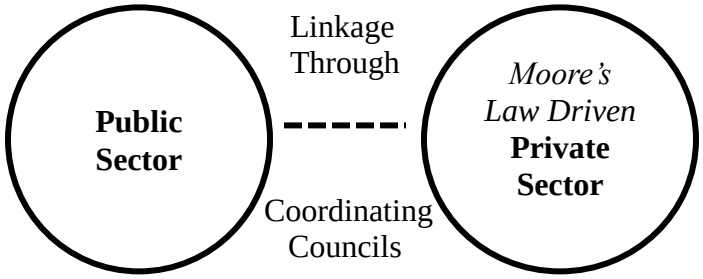


Figure 1
Typical Public-Private Cyberspace Partnership Model

**A key aim is to integrate and field test research prototypes emerging from Moore's Law, which holds that information technology capabilities double every 18 months.*

To understand the uniqueness of the cooperative agreement the CoI has executed with the private sector, it is useful to examine how this kind of model compares to more conventional models. The typical or current public-private cyberspace partnership model is shown in Figure 1. While "partnerships" are a popular concept, it has been recognized that the reality of this kind of partnership does not yield optimal solutions.

A July 2010 Government Accounting Office (GAO) report found that Federal stakeholders felt that improvements could be made in the partnership if private sector stakeholders would share sensitive information. Figure 1 demonstrates the GAO finding that the private sector stakeholders are hesitant to share their research with the Federal government for a variety of reasons, including fear of public disclosure of proprietary or business sensitive information that could potentially result in the loss of shareholder returns. Therefore, Coordinating Councils alone do not always address the needs of both sides to enable collaborative research, especially in highly-charged, emerging trade space.

Continued implementation of partnerships that strive to meet commercial expectations is an effective means of building the desired ecosystem, which is required to prevent pervasive and sustained computer based attacks.

The CoI Public/Private Cyber-Space Partnership Model:

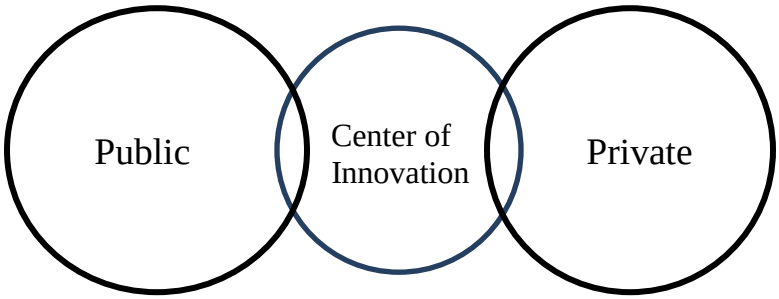


Figure 2
CoI Public-Private Cyberspace Partnership Model

As illustrated in Figure 2, the CoI is successfully exploring ways to build cooperative relationships with industry to further these goals. Using cooperative agreements for research, many of which are already underway with companies like Intel Corporation and the IBM Watson Research Center, the CoI is able to jointly conduct research with private sector companies (driven by Moore's Law) in an established framework for federally-assisted research. The CoI holds that these types of research vehicles address some of the challenges highlighted in the GAO report that constrain private stakeholders from engaging in cooperative research with the Federal government because of the legitimate fear of losing sustainable competitive business advantage.

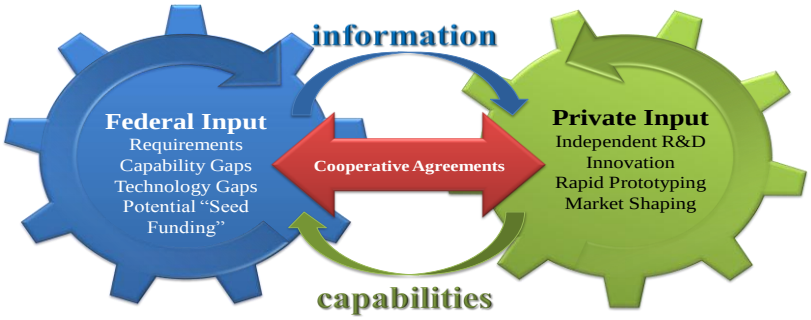


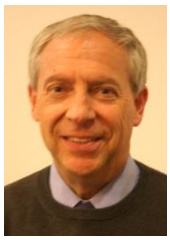
Figure 3
CoI leverages cooperative agreements that facilitate open communication and cooperative research and development.

Figure 3 demonstrates how the CoI accepts funding from several government sources to link private sector research technologies in novel ways to create game-changing innovations. Most importantly, these private research technologies have a greater probability of being COTS products within the next 1-3 years.

Cutting Edge Technologies and Game-Changing Process Innovations

Through this process, the CoI has created an engine of innovation driven by public-private partnerships and open cooperation. With DHS S&T and the CoI pioneering collaborative partnerships, these industry titans are opening their research departments to the Federal government to advance technology development toward a common goal. The CoI is in the process of integrating several private industry research technologies to discover the "Art of the Possible" for better communication and collaboration among Federal government organizations. Current CoI efforts are focused on providing start-up companies the same opportunities in this public-private innovation cauldron.

The CoI is managed by a newly formed organization at DHS S&T called the Research and Development Partnerships Group (RDP). RDP serves as the primary collaborative group for DHS S&T. The Interagency Office supports RDP and the Directorate by serving as S&T's lead facilitator and systems integrator for helping our internal and external members of the Homeland Security Enterprise achieve their respective missions. RDP enables a collaborative and innovative "ecosystem" consisting of interagency partnerships, public-private partnerships, and state, local, territorial and tribal partnerships to identify, test, and eventually field innovative and game changing technologies.



Terry C. Pierce, D.P.A., M.A., is the Director of the Center of Innovation, Science and Technology Directorate, U.S. Department of Homeland Security. He focuses on creating public-private partnerships to enable game-changing innovations for the homeland security enterprise. He has written several articles and a book on championing disruptive innovations in the federal government and is a retired officer of the U.S. Navy.

Randel L. Zeller, M.S., is the Director of the Interagency Office in the Science and Technology Directorate, U.S. Department of Homeland Security. He leads homeland security stakeholder collaboration efforts. A member of the Senior Executive Service, he also serves as adjunct faculty in the Harvard University National Preparedness Leadership Initiative.

Thomas A. Cellucci, Ph.D., MBA is the U.S. Department of Homeland Security's Director of Research & Development Partnerships Group (Acting) and the first Chief Commercialization Officer in the Department. He leads the private sector outreach initiatives for DHS S&T has written a series of reference guides to facilitate the development and articulation of operational requirements for DHS stakeholders.