Transforming Government Through Collaborative Innovation

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F O R E W O R D

On behalf of the IBM Center for The Business of Government, we are pleased to present this report, "Transforming Government Through Collaborative Innovation," by Satish Nambisan. This is a unique report. Professor Nambisan describes how two important tools—collaboration and innovation—can be used together to transform government in the years ahead.

For a decade, the IBM Center for The Business of Government has published research on the role of collaboration within public management. John Kamensky, a senior fellow at the IBM Center, describes collaboration as occurring "when people from different organizations produce something together through joint effort, resources, and decision making, and share ownership of the final product or service. The focus is often on producing or implementing something." With the release of this report, the IBM Center continues its focus on the importance of collaboration in transforming government.

Innovation remains another major area of research for the IBM Center. Based on research supported by the IBM Center, there is general consensus that an innovation is something that is new, usually novel, and aspires to change the way an organization (or part of an organization) operates and delivers service to the public.

The message of the Nambisan report is that government no longer needs to "innovate" all by itself. Government, like the private sector, is now beginning to tap into and deploy the resources of organizations and individuals in other sectors to develop and create innovations, such as new ways to deliver public services.

In the private sector, the once predominant and rather costly model of innovation involved each company having its own in-house R&D laboratory filled with researchers who were employees. In recent years, this has changed dramatically. Many companies are now reaching out for good ideas from across the world—creating "idea contests" or using social networking technologies, such as posting problems on the Internet and asking experts to submit solutions.

Albert Morales

Richard Warrick

In this report, Nambisan describes how Staples holds idea contests, called Invention Quests, in which independent inventors are invited to submit their ideas to Staples. Winning ideas are then commercialized by Staples under its brand name, with the inventor receiving royalties.

Government's challenge is to learn from similar private and nonprofit sector experiences, developing new ways to move beyond the boundaries of individual government agencies and find innovative ideas in what may have been, until today, the least likely of places. This report provides a guidebook for government on ways to reach out.

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EXECUTIVE SUMMARY

The performance of American government in the 21st century will be shaped by how well it adopts collaborative innovation to harness external resources and creativity in addressing the nation's most challenging issues. Often these issues are ill defined or emergent in nature, involve diverse sets of stakeholders, and cross organizational and geographic boundaries.

This report offers a network-based, collaborative innovation framework to explain how government agencies (federal, state, and local) can partner with varied external networks and communities—including citizen networks, nonprofit organizations, and private corporations—and play different types of problem-solving roles to find innovative solutions that drive transformational change in the business of government. The promise and the potential of such a network-based approach to innovation and problem solving have been well demonstrated in the private sector in recent years. The objective of this report is to show how some of the very same approaches that have found success in the private sector can be applied in the public sector.

Network-based collaborative innovation is defined as an externally focused approach to innovation and problem solving that relies on harnessing the resources and capabilities of external networks and communities to amplify or enhance innovation speed and innovation outcomes. It has four foundational principles:

1. A shared set of goals and objectives that acts as the glue to keep the network together and give direction to member activities

2. A shared "worldview" and awareness that enable diverse network members to interpret the dynamic external environment in a consistent manner

3. "Social" knowledge creation that emphasizes new knowledge creation through interactions and dialogue among network members

4. The "architecture of participation," which provides the governance mechanisms for the contributions of the participants to be coordinated, integrated, and synchronized in a manner that benefits or rewards all the network members

The framework offered here considers two critical aspects of collaborative innovation and problem solving: (1) the nature of the innovation or problem, and (2) the nature of the collaboration arrangement or network leadership. Based on this, four distinct roles are identified for the government to play in collaborative innovation:

*   Innovation integrator

*   Innovation seeker

*   Innovation champion

*   Innovation catalyst

The former two roles imply a more active and dominant position for the government and involve directing external partners and/or translating external innovative ideas into new government services and programs; the latter two roles reflect a more supportive function that involves finding common ground with diverse communities and stakeholders to create public good in areas that complement or fall largely outside existing services and programs.

Drawing on examples from varied public sector areas including environmental conservation,

disaster management, education, health care, and local law enforcement, this report illustrates the key characteristics and the critical challenges of the four problem-solving roles. The report also provides examples from the private sector—from companies such as Boeing, IBM, 3M, Procter & Gamble, and Staples—to highlight some of the best practices associated with collaborative innovation.

The different approaches to collaborative innovation and problem solving also imply the need for different types of collaboration competencies and infrastructure. The report focuses on four sets of capabilities that government agencies will need to build:

- An organizational culture of openness and a collaboration mind-set

- The right organizational structure

- Leadership and relational capabilities

- Success metrics

Building these four capabilities and developing the appropriate set of organizational competencies and capabilities are critical for success.

The report concludes with a set of three recommendations that together provide a practical road map for senior leaders of government agencies to promote and lead collaborative innovation and problem-solving initiatives that deliver significant public good.

Introduction

In the early 1990s, a radically new approach to environmental conservation took root in southern Montana to protect the Blackfoot River Valley—the famous setting for Norman MacLean's autobiographical novella *A River Runs Through It*—which was by then an industry-ravaged landscape rapidly losing its wildlife habitat. The movement, the **Blackfoot Challenge**,[1] was a unique initiative. Started by a few private landowners, it gradually involved a diverse set of partners including government agencies, private companies, and nonprofit organizations, all of whom shared in the common vision of restoring the area's ecosystem and preserving the watershed. Over the last 15 years or so, the Blackfoot Challenge has produced remarkable results: More than 1,500 acres of wetlands and 15,000 acres of native grasslands have been restored, and nearly 45,000 acres of private land have been protected with perpetual conservation easements.[2]

The Toronto Transit Commission (TTC) is a public entity that runs the third-largest public transit system in North America (serving approximately 2.4 million riders every day). From the mid-1990s onward, TTC has faced steep increases in its rider population and a considerable decline in funding. Together, these two factors have led to an aging and severely strained infrastructure and highly dissatisfied customers. In February 2007, TTC, under the leadership of its new chairman, Adam Giambrone, embarked on a radical approach to seek out innovative ideas and solutions from its customers to improve the quality of services. Assisted largely by the Toronto blogging community, TTC organized a unique one-day collaborative problem-solving event called the **Toronto Transit Camp**, focused on revitalizing TTC's services as well as its website. The participants (including ordinary riders, transit activists, and technology geeks) came together—both online (using real-time Web 2.0 collaboration tools) and in person—to collaboratively find creative solutions to TTC's website and the user experience of transit in the city. The innovative ideas and solutions sourced from the participants formed the primary input for the TTC to completely revamp its website and operations.[3]

The Blackfoot Challenge and the Toronto Transit Camp portend the complex nature of the problems that government agencies will increasingly be confronted with as well as the unique promise for a diverse network of entities, including citizens, government agencies, private corporations, and nonprofit organizations, to come together and create innovative solutions that address important public sector issues.

Indeed, in many areas of the government ranging from education and health care to homeland security and environmental conservation, the nature of the problems has changed drastically. They are increasingly ill defined or emergent, involve diverse sets of stakeholders, and cross organizational and geographic boundaries.[4] It is evident that the first step toward addressing such issues would be to pursue a policy agenda that is focused more on the problems than on the structures of the agencies charged with solving them.[5] However, importantly, it is also clear that the transformational innovation—in business models, operations, and services offered by government agencies—needed to address such problems is unlikely to always originate from within the four walls of the government. Government agencies will need to "look outside" and harness the creative talent and expertise that reside outside their boundaries.

At the same time, the opportunity for the government to partner with external entities to source innovative ideas and solutions is also increasing rapidly. There has been a significant increase in the number of non-profit organizations and small private companies that possess niche knowledge and capabilities with direct application to the public sector (for example, expertise in the areas of school curriculum development, implementation of health information technologies, and coordination of disaster management activities). There is also a growing number of citizen "experts" or "inventors" whose creativity and domain knowledge can be leveraged to create public good. Further, in recent years, new types of institutional arrangements (for example, innovation intermediaries) and new technological infrastructure (for example, Web 2.0 tools such as blogs and wikis) have emerged that have made it easier to tap into such a diverse network of creative talent.

This innovation context is not unlike the one that many large U.S. corporations such as IBM, 3M, DuPont, and Boeing have faced in recent years. To leverage the benefits of such an expanding horizon of external innovation opportunities, many of these companies have initiated a gradual shift from innovation initiatives that are centered on internal resources to those that are centered on external networks and communities.[6] For example, IBM has successfully partnered with Linux and other open-source software communities. Similarly, consumer product companies such as Procter & Gamble and Dial have partnered with independent inventors to source new product concepts and ideas. Technology companies such as 3M and DuPont have partnered with external scientist networks to source solutions to specific technical problems.

These success stories from the private sector and the imperatives for collaborative problem solving in the public sector discussed earlier together raise two important questions for government leaders. First, are some of the collaborative innovation and problem-solving approaches adopted by the private sector applicable in the government context? Second, are there some practical insights that government leaders can learn from the private sector on managing such collaborative innovation? The answer to both of these questions is an emphatic "yes" and forms the primary motivation for this report.

This report identifies four distinct collaborative innovation and problem-solving contexts that government agencies are likely to face in the 21st century:

- *Government-led collaborative effort with external partners to solve well-defined problems* related to the agency's existing services and programs (for example, developing a new type of weapons system)

- *Government-led collaborative effort to solve emergent or ill-defined problems* related to the agency's existing services and programs (for example, reforming the public school education system)

- *Community-led effort to solve emergent or ill-defined problems* that are related to but not part of the agency's services and programs, that is, problems whose solutions fall outside the agency's operational control (for example, enhancing the adoption rate of health information technologies in the health care industry)

- *Community-led effort to solve well-defined problems* that complement the agency's existing services/programs (for example, developing innovative citizen-based crime prevention programs)

Based on these different contexts, the report identifies four different roles for the government in collaborative innovation and problem solving: innovation integrator, innovation seeker, innovation champion, and innovation catalyst. The report elaborates on these four roles and considers the organizational competencies and capabilities that government agencies would need to acquire to be successful in such collaborative initiatives. In discussing these issues, the report draws on examples from both the private and public sectors.

Network-Based Collaborative Approaches in Government

In Government Operations and Service Delivery

The notion of applying network-based collaborative approaches in the public sector is not really new. Over the last 15 years or so, the traditional hierarchical model of government has increasingly been replaced with a network model where the government executive's core responsibilities center "on organizing resources, often belonging to others, to produce public value."[7] However, this has largely been limited to the production and delivery of government services or operations.

Consider a few examples. In the 1990s, the Arizona Motor Vehicles Department established a network of more than 70 private companies to handle its day-to-day operations such as vehicle title and registration, driver's license services, and vehicle inspections. Private companies that met the compliance standards set by the program and were duly qualified and authorized served as another channel to offer the services to the Arizona public, enabling the agency to enhance customer-service quality without increasing costs. Similarly, in the state of Texas, the delivery of child care services is undertaken by a diverse network of private and nonprofit organizations. The government agency establishes the rules and policies that govern the child care program, provides the funding to run the program, and monitors the performance of the network partners who actually deliver the services.

Still another example is offered by Wisconsin's Welfare Works (W-2) program implemented in the mid-1990s. At the heart of the W-2 program is a network-based welfare-to-work service delivery system that incorporates around 72 W-2 agencies, most of which are private and non-governmental organizations. These private agencies independently deliver a wide range of services—from job training and transportation assistance to day care—but are closely monitored and evaluated by Wisconsin's Department of Workforce Development, which sets the overall performance criteria.

Such network-based, "third-party government" models are evident in many other areas of government at the local, state, and federal level—from military operations, social services, and health care services to more mundane government tasks such as road maintenance and trash collection—and indicate the shift in government's role from being a service provider to a service coordinator. This shift involves establishing a network of partners and empowering them to provide specific services that would normally have been delivered by the government agency.[8]

As many government agencies have discovered in the last decade or so, making such a shift requires overcoming several key challenges—for example, aligning potentially conflicting partner goals and objectives, identifying appropriate market incentives for diverse partners, establishing process standards, and implementing agency-wide metrics to evaluate partner performance. At the same time, the benefits from making such a shift are equally promising—for example, enhanced speed and quality of service delivery, reduced investment of public resources, increased flexibility or ability to reassign resources based on the dynamic external environment, the ability to exploit the "best of breed" service providers, and increased reach to source rare resources and expertise.[9]

The evidence of network-based government service delivery systems continues to grow day-by-day—at all levels of government—and illustrates the relevance and effectiveness of such an approach in today's world, marked by severely limited public resources, greater citizen diversity and the associated complexity in the nature of required services, and highly dynamic economic and technological environments. Importantly, it also indicates the potential to apply a similar network-based collaborative approach toward finding innovative solutions to some of the important problems in the public sector.

In Government Innovation and Problem Solving

The case of the Blackfoot Challenge and the Toronto Transit Camp illustrate the relevance and the power of the network-based approach in government innovation and problem solving. It is clear that an increasing number of problems in the public sector (such as in health care, education, and the environment) overlap with the agendas, goals, and capabilities of both governmental and non-governmental (private and nonprofit) organizations. In such contexts, the network-based approach becomes imperative to find common ground, to seek out appropriate resources and expertise, and to devise innovative solutions—solutions that might lead to new services and programs either within or outside the government.

Network-based collaborative innovation is defined here as an externally focused, collaborative approach to innovation and problem solving in the public sector that relies on harnessing the resources and the creativity of external networks and communities (including citizen networks as well as networks of nonprofits and private corporations) to amplify or enhance the innovation speed as well as the range and quality of innovation outcomes (or solutions). Such a network-based approach will be built on four foundational principles.[10]

- **Shared goals and objectives:** In a network, a shared set of goals and objectives is critical for the members to relate to one another and to develop a sense of cohesiveness. Depending on the nature of the network, such goals and objectives might be devised and promoted by the lead government agency or might emerge

over time through repeated interactions among the network members.

- **Shared worldview and awareness:** A shared worldview implies a common set of assumptions, evaluation methods, and mental frameworks that together enable diverse network members to interpret the dynamic external environment in a consistent manner. The connectedness of the network enables rapid information sharing and thereby facilitates the maintenance of such a shared awareness even as the external environment changes.

- **"Social" knowledge creation:** The concept of social knowledge creation implies that new knowledge will increasingly be created through repeated interactions (or dialogue) among the network members; that is, it emphasizes the collaborative and cumulative nature of knowledge creation. Innovative ideas that emanate from one member will be built upon by other members, and the dialogue among network members becomes the context for such gradual idea evolution. Thus, the social infrastructure in the network that facilitates such dialogue is important to sustain the innovative efforts of the members.

- **Architecture of participation:** A network also has to provide an architecture that supports member participation in the innovation activities.[11] This includes a structure to distribute the innovation work as well as a method to share the innovation "rights" (or the rewards from the innovation) among the network members. The first aspect relates to the mechanisms and methods for individual members' innovation contributions to be coordinated, integrated, and synchronized in a coherent manner. The second aspect relates to the incentive structure by which individual members are rewarded for their contributions to the problem solving.

Depending on the context and the nature of the network-based approach, the real-world manifestations of each of these four principles would vary. Table 1 on page 12 illustrates these principles in the case of the Blackfoot Challenge initiative.

Unlike in the case of government service delivery or operations, the network-based approach in

Table 1: Foundational Principles of Network-Based Collaborative Innovation as Applied to the Blackfoot Challenge

Key Principle	Description	The Principle Applied in the Case of the Blackfoot Challenge
Shared goals and objectives	One or more goals that help bring the network members together and channel their diverse resources and activities	Enhance, conserve, and protect the natural resources and the rural lifestyles of the Blackfoot River Valley for present and future generations
Shared "worldview"	Common assumptions, and mental models related to the innovation and its external environment	Shared understanding of environmentally responsible resource stewardship and the adoption of Best Management Practices (BMPs) both on and off conservation easement lands
"Social" knowledge creation	Emphasis on interactions among network members as the basis for new knowledge creation	Different types of forums and committees facilitate interactions and dialogue among private landowners, federal and state land managers, and local government officials to generate and develop innovative solutions
Architecture of participation	Defines a set of systems, mechanisms, and processes to facilitate participation in value creation and value appropriation	A diverse steering committee represents all interests in the watershed and facilitates widespread participation; newsletters, educational workshops, and tours help diffuse best practices and other relevant information, enabling all partners to benefit from the initiative

government innovation can assume multiple forms—collaboration with different types of external partners to solve different types of problems—with critical implications for the different roles that government agencies will need to play and the capabilities they will need to acquire. To understand these different government roles and their associated benefits and challenges, we need to first consider the underlying dimensions of collaborative innovation in government.

Four Roles for the Government in Collaborative Innovation

Two important dimensions structure the landscape of collaborative innovation and problem solving in government. The first dimension relates to the nature of the innovation or problem—that is, how well the problem is defined and how the innovative idea evolves. The second dimension relates to the nature of the collaboration arrangement or network leadership—that is, how the innovation activities are coordinated and how the network partners share in the decision making.

Consider the first dimension: the nature of *innovation*. The innovation or problem space can be conceptualized as a continuum that has "defined" problems at one end and "emergent" or ill-defined problems at the other end. At the defined end of the continuum, the problem space is framed or defined by existing government services and programs or technology infrastructure and systems; for example, innovations that improve the delivery of existing social welfare programs or technological infrastructure innovations that enhance the effectiveness of tax collection. At the other end of the continuum, the problem space may be less well defined or more emergent in nature; for example, innovations that involve creating new mechanisms and systems for disaster management or those that address emerging public sector issues such as global warming. Although the broad contours of the problem might be known—for example, the target population for a new government service or program—bringing more clarity to the problem might require acquiring inputs from diverse stakeholders.

Figure 1: Four Roles for the Government in Collaborative Innovation[12]

		Network Leadership	
		Government-Led (centralized; formal structure/linkages)	**Community-Led** (diffused; informal structure/linkages)
Innovation Space	**Emergent (**new services/programs; unstructured problem space)	**Government as Innovation Seeker**	**Government as Innovation Champion**
	Defined (existing services/programs; structured problem space)	**Government as Innovation Integrator**	**Government as Innovation Catalyst**

The second dimension, the nature of the collaboration arrangement or *network leadership,* reflects the organization or structure of the network. Network leadership can be conceptualized as a continuum of centralization, ranging from government-led or highly centralized to community-led or diffused. At the centralized end of the continuum, the relevant government agency assumes the role of the dominant partner and leads the network. For example, in most defense-related innovation projects, the lead agency plays such a leadership role. Note that leadership can be exercised in different ways— envisioning and establishing the innovation goals, selecting the network members, and making the critical decisions that affect or shape the nature or process of innovation. At the diffused end of the continuum, the leadership tends to be loosely distributed among the members of the network or community, with the government agency playing a non-dominant role. A good illustration of this in the non-governmental context is the case of open-source software projects, which often have a leadership structure wherein the community members share in the decision-making powers.

These two dimensions define four different roles that government agencies can play in network-based collaborative innovation and problem solving (see Figure 1):

1. Innovation integrator
2. Innovation seeker
3. Innovation champion
4. Innovation catalyst

Each of these four roles emphasizes partnerships with different types of external entities, different types of collaboration arrangements, and different types of innovation outcomes. Next, these four government roles are described in more detail.

Government as Innovation Integrator

The first role—government as the innovation integrator—is one that is well established in several parts of the government, most notably in the defense sector. It reflects a context wherein the problem is well defined in terms of desired goals and objectives and network leadership is provided by the government agency. Further, the solution (or innovation) is owned and deployed by the agency and incorporated within its existing set of services and programs.

As innovation integrator, the government (1) brings together a set of external partners (typically private companies with specific capabilities and expertise) who innovate based on defined innovation architecture, and (2) orchestrates or facilitates the integration of those contributions to develop the final product or service. Innovation processes tend to be highly organized and coordinated, with significant investments made by the government in infrastructure to support the activities of the network members.

A good illustration of such an integrator role in the private sector is the case of Boeing's development of its new airplane, the Dreamliner 787. For developing the 787, Boeing assembled a set of global partners whom it could trust with the process of creating entire sections of the plane, from concept to production. The design and development tasks were not just outsourced to these partners. Instead, partners made financial investments in those tasks. In other words, Boeing made a critical shift from making its partners "build to print" to making them "design and build to performance."[13] Although each global partner had a lot of autonomy with regard to the design of its individual components, there was still a need for a single decision maker on important design and development

issues—and Boeing played that central decision maker role.

The globally dispersed partner companies also needed to converse in real time, interpret the design information gained from others, and integrate that knowledge with the design of the components that they themselves were responsible for. Boeing addressed this challenge by creating a sophisticated virtual Global Collaboration Environment. This was instrumental for Boeing's network partners to rapidly share information and maintain a high level of "situational awareness" critical to adapting to changing technological and market needs.

Boeing's 787 project thus describes a situation wherein a group of entities come together to devise and develop an innovation whose basic architecture is defined and shaped by the dominant network member. The innovation architecture typically emphasizes efficiency over novelty, so there is a heavy emphasis on modularity of the innovation architecture.

Government's role as the innovation integrator is particularly relevant in finding solutions to relatively well-defined but complex problems

	Network Leadership	
	Government-Led	**Community-Led**
Emergent	Innovation Seeker	Innovation Champion
Defined	Innovation Integrator	Innovation Catalyst

(Innovation Space labels the left axis with rows Emergent and Defined)

Table 2: Characteristics of the Role of the Government as Innovation Integrator

Nature of the Innovation or Problem	Nature of Network Leadership	Example	Primary Function of the Government Agency	Key Success Attributes
Well-defined problems that fall within existing services/programs of the lead agency	Government-led; centralized; lead agency controls all the innovation activities	Developing a new type of weapons system	• Envision and define the project • Establish and support the network • Coordinate innovation activities • Achieve final solution integration	• Ability to bring clarity to innovation goals and tasks • Ability to establish trust-based collaborative environment • Ability to get partners committed to or invested in the project

in areas such as defense, homeland security, customs and border protection, and nuclear energy. However, the innovation integrator role also implies the need for government agencies to make a departure from the traditional government-contractor collaboration arrangement evident in most such contexts and move toward a more network-based collaborative approach illustrated by the Boeing example.

Specifically, this involves three aspects of the innovation integrator role:

• The lead agency has to assume the sole responsibility for providing a clear definition of the problem that needs to be solved and to communicate the desired goals and outcomes to the primary network partners. These tasks should not be delegated to any other network partner

• The agency has to not only select the network partners (based on their specialized knowledge or expertise) but also actively involve them in defining the solution (or innovation) architecture that in turn will provide the basis for structuring the activities and contributions of the different partners

• Perhaps most important, as the case of the Boeing 787 illustrated, truly collaborative problem solving requires that the agency does not just "contract out" the design and development tasks to suppliers. Instead, it should enable the

partners to play a more inclusive role and ensure that they are sufficiently invested in the project. This implies that partners will need to assume a greater level of project risk (for example, technological risk and development risk)—as Boeing's partners did in the case of the 787 project—and also share in the rewards. In turn, this calls for greater alignment of goals and incentives among the diverse network partners, and achieving this becomes the key responsibility of the lead agency playing the integrator role.

The leadership provided by the agency is also crucial to ensure that the innovative contributions of the different partners add up to a valuable whole. In certain contexts—particularly in instances where the agency possesses the requisite integration capabilities or where it is difficult to partition the responsibility for integration—the agency may carry out the integration task by itself. In other contexts, the government agency may assign another network partner with the job of driving the integration efforts and limit itself to facilitating the process. Whatever the manner in which such integration is structured, the ultimate responsibility will still remain with the lead agency.

Recommendations

Based on the experience of companies playing the role of innovation integrator in the private sector, the following four recommendations are for government agencies intending to play a similar role in the public sector.

Recommendation 1: Define the problem
The lead agency should assume the primary responsibility for defining the problem that needs to be solved and for communicating the desired goals or outcomes to the primary network partners. These tasks should not be delegated to any other network partner.

Recommendation 2: Collaboratively envision the solution architecture
The lead agency should engage the primary network partners in envisioning and defining the innovation (solution) architecture, with the final decisions resting with the government agency.

Recommendation 3: Ensure partner commitment
The lead agency should make sure that the primary network partners involved in the design and development of the innovation (solution) are sufficiently invested in the project, that is, they assume the risks as well as share in the rewards.

Recommendation 4: Establish the collaborative environment
The lead agency should establish the technological infrastructure to support knowledge sharing and relationship building among network partners.

Government as Innovation Seeker

In this second role as innovation seeker, the government agency seeks out innovative ideas—that it could then develop into new services and programs—from a diverse network of citizens, volunteer scientists and researchers, and nonprofit organizations. The nature of the innovation tends to be emergent, as the specific problems are not always pre-specified by the agency. Instead, innovative ideas or solutions emerge from the network often based on "perceived problems" of key stakeholders. And if those solutions fit with the agency's overall goals and agenda, then they are implemented or transformed into new services and programs. Before we discuss this further, consider the illustration of this role in the private sector.

Several consumer product companies including Procter & Gamble, Dial, Gillette, Sunbeam, and Unilever have discovered that playing the role of innovation seeker can deliver significant benefits in terms of both the range of ideas and the speed of innovation. These companies seek out innovative product ideas from customers, independent inventors, and other such external sources, and then use their proprietary commercialization infrastructure to build on the ideas and bring them to the market as new products and services.

For example, Staples Inc., the leading office supplies company in the United States, holds idea contests called Invention Quests: Independent inventors are invited to submit their ideas to Staples, and winning ideas are commercialized by Staples under the Staples brand name with the inventor receiving a share of the revenues.[14] In pursuing such an approach, the company is able to source ideas from a large and diverse inventor community, significantly increasing its potential to generate valuable product concepts.

The only constraint is that the idea sourced should fit in with the company's broad market goals and objectives. A critical success factor here is the ability of the company to develop a trust-based relationship with the inventor community and to offer a transparent and fair process—thereby positioning itself as the company of choice that independent inventors would reach out to first with their innovative ideas and solutions.

Much of these principles and practices apply in the public sector, too. Government agencies that play the role of the innovation seeker can harness the vast creative potential of the citizenry—either directly or indirectly (through intermediaries)—to create new services or to significantly enhance the quality and effectiveness of existing programs and services. Such a role also underlines the new responsibility of the citizens—as Don Kettl notes, "one that requires them to rethink their connection to and involvement in the pursuit of the public interest."[15]

At a broader level, the innovation or problem-solving context relates to the design and delivery of a wide range of social or public services wherein citizens can contribute based on their knowledge as "customers" of government services. For example,

	Network Leadership	
	Government-Led	**Community-Led**
Innovation Space — **Emergent**	Innovation Seeker	Innovation Champion
Defined	Innovation Integrator	Innovation Catalyst

in government areas such as health and human services, internal revenue services, citizen and immigration services, and transportation, government agencies have the potential to tap into the creativity of citizens and to seek out ideas and solutions to problems that are not always visible to the agency.

Citizen Engagement in Transportation

Consider the case of the Toronto Transit Camp described previously. The Toronto Transit Commission played the role of an innovation seeker by welcoming innovative ideas and solutions from its customers: the traveling public. TTC did not define the specific problems to be solved; instead, it merely identified the broad areas where it was seeking ideas for reform—for example, transit services and TTC's website. The specific problems (and their solutions) were emergent in nature; they evolved from the continued discussions and dialogue among the volunteer citizens who participated in the Transit Camp. The ideas and solutions that fit with the TTC's goals and objectives were then taken up for implementation by the agency.

A wide range of tools and techniques are available for engaging citizens in such activities both offline (such as polling, citizen study circles, and citizen juries) as well as online (such as online dialogue forums and discussion boards, and government blogs and wikis).[16] In the case of the Toronto Transit Camp, collaborative problem solving was made possible by Web 2.0 technologies including blogs, wikis, and social networking sites. Similarly, Neighborhood America has helped the government reach out to volunteer citizens and seek out ideas related to several high-profile public projects including the Imagine New York initiative and the Flight 93 memorial.[17] Finally, Second Life and other three-dimensional social networking platforms have enabled citizens to develop and offer sophisticated prototypes of their innovative solutions (for example, downtown redevelopment plans and layouts) to government agencies.

The above examples of citizen engagement are illustrative of the potential for citizens to be involved in government innovation. Arguably, some of these examples are still only consultative (focused on obtaining feedback from citizens) and do not represent collaborative problem solving (where citizens play an active role in initiating and evolving the

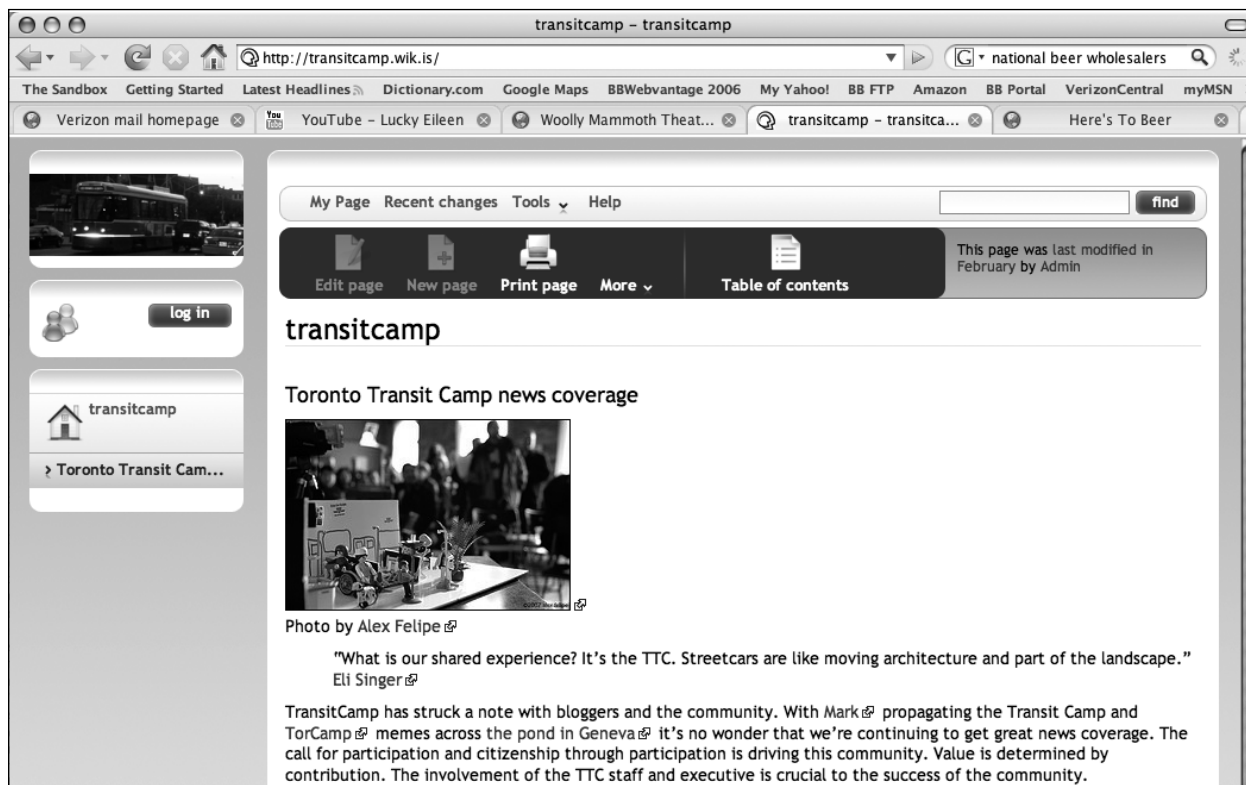**Figure 2: Toronto TransitCamp (www.transitcamp.org)**

Table 3: Characteristics of the Role of the Government as Innovation Seeker

Nature of the Innovation or Problem	Nature of Network Leadership	Example	Primary Function of the Government Agency	Key Success Attributes
Emergent or ill-defined problems that are directly related to existing services/programs of the lead agency	Government-led; centralized; lead agency "owns" the infrastructure for implementing the solution	Reforming public school education system	• Communicate reform agenda • Seek out and evaluate innovative ideas and solutions • Translate ideas into new or improved services/programs	• Ability to attract and retain diverse network of innovators • Ability to bring transparency to the problem-solving process • Ability to transform external ideas into new services/programs

innovation). For that to happen, government agencies will need to actively seek out and sustain long-term relationships with relevant citizen networks and share with them the agency's broader innovation or reform goals—very much the same way that Staples established relationships with independent inventors and shared with them the company's broader market goals. The government agencies will also need to establish the internal infrastructure to seek out and facilitate such citizen innovation and to build on those creative ideas and integrate them with existing programs and services.

Nonprofit Organization Engagement in Education

Citizens are not the only source of such innovative ideas; ideas can be sourced from nonprofit organizations, too. For example, consider the approach adopted by Chancellor Joel Klein to reform the New York City School system.[18] By partnering individual schools with a "school support organization" or a network of nonprofit organizations and giving the school principals more freedom to try out innovative ideas, the city school system has, in effect, become an innovation seeker—able to seek out innovative ideas for curriculum improvement and operational transformation from diverse sources and to implement them rapidly. Note that the dominant player in the network is the individual school (or the city school system) that makes the key decisions related to the selection and implementation of the innovative ideas.

The success of this network-based approach calls for the government agency to be able to establish relationships with a diverse set of partners. Indeed, the greater the partner diversity in the network, the greater the range of ideas sourced. A related challenge is to identify and cultivate the appropriate types of incentives for these different partners to contribute ideas. The incentives that apply to volunteer citizens may not apply to nonprofits. As such, a key task for the agency would be to understand the motivations of the different partners to be engaged in the problem-solving process and to adopt practices that would offer the right incentives.

Further, building transparency into the problem-solving process also helps to keep the citizens engaged. For example, in the case of the TTC, the agency's ability to share with the citizen contributors how the agency processed or acted upon their innovative ideas and solutions is equally important. Such openness enables citizens and other external contributors to perceive themselves as part of the extended organization and enhances their overall commitment.

Finally, the ability of the agency to rapidly transform external ideas into new or improved services and programs is also important. As most private companies have discovered, embracing external innovative ideas and converting them into new products and services often requires making changes in the internal organizational culture, structure, and processes. For example, in the context of the school system described earlier, such changes may include the way

local decisions are made, the success metrics used to evaluate school programs, and the nature of the feedback process. To be successful as an innovation seeker, government agencies will need to be willing to make such bold changes in their internal structures and processes.

Recommendations

Here are four key recommendations for government agencies planning to play the role of innovation seeker to source innovative ideas from citizens, non-profits, and similar external sources.

Recommendation 5: Build the "right" network

The lead agency should attract and sustain a diverse network of independent innovators (for example, volunteer citizens and nonprofits) and offer them an appropriate set of incentives to keep them engaged in the innovation process.

Recommendation 6: Communicate the innovation agenda

The lead agency should identify some broad areas of reform (or problem solving) within its existing service portfolio and communicate that to the network members without in any way constraining the nature of the innovative ideas and solutions generated by them.

Recommendation 7: Establish "open" relationships with partners

The lead agency should enhance the level of transparency in its operations and in the problem-solving process in order to gain the trust and the willingness of citizens and other external partners to continue to contribute innovative ideas.

Recommendation 8: Adapt the organization to embrace external ideas

The lead agency should undertake a careful review of its internal processes and decision-making structures and make appropriate changes so as to be able to accept and implement external ideas and solutions.

Government as Innovation Champion

In certain public sector contexts such as environmental conservation, emergency preparedness, and health care, the government may not be the primary agent for innovation; that is, the problems being solved (as well as the potential solutions), even if related to the broad agenda of a particular government agency, may fall outside its realm of operations. However, the agency may still be able to bring together the relevant set of partners (including citizens, nonprofits, and private corporations) and champion or steer them toward innovative solutions that create significant public good.

The third role—government as innovation champion—emphasizes such a supportive role that a government agency can play in contexts where a community of innovators comes together to collaborate in envisioning and developing innovative solutions to address problems that are emergent in nature and fall mostly outside the existing service portfolio of the agency.

There are two defining characteristics of such a context. First, the innovation space is typically not well defined, and the objectives and direction of the innovation tend to emerge organically from the continued interactions of the network partners. Second, the nature of the problem to be solved is such that it requires contributions from a diverse set of partners, and no one partner would be able to assume a dominant role. The problem-solving process tends to be *community-led* rather than government-led, that is, the responsibility for leading and coordinating the innovation activities is diffused among the network members. To illustrate this type of innovation, let's consider several non-governmental initiatives in various sectors.

Scientific Research

The Tropical Disease Initiative (TDI) is a web-based, collaborative innovation effort aimed at identifying cures for tropical diseases such as malaria and tuberculosis. The project, launched by a group of U.S.-based scientists and academic researchers, aims to bring together computational biologists and other volunteer researchers to work collaboratively on specific tropical diseases. The output from the TDI project—drug leads or targets—are made available in the public domain (for example, published in peer-reviewed journals and licensed through Scientific Commons). Other researchers could use them to guide their own clinical research work or they could be taken up for further development and commercialization by nonprofit pharmaceutical organizations such as the OneWorld Health.[19]

While a core body of founding members provides broad direction for the community and facilitates collaboration and communication among members, scientists from all over the world who form the community share in the project-level decision making. Further, while there is broad focus on tropical diseases, the identification of specific

		Network Leadership	
		Government-Led	**Community-Led**
Innovation Space	**Emergent**	Innovation Seeker	Innovation Champion
	Defined	Innovation Integrator	Innovation Catalyst

Table 4: Characteristics of the Role of the Government as Innovation Champion

Nature of the Innovation or Problem	Nature of Network Leadership	Example	Primary Function of the Government Agency	Key Success Attributes
Emergent or ill-defined problems that relate to but **do not fall** within the lead agency's services/programs	Community-led; diffused; network members share the decision-making powers	Enhancing the adoption rate of health information technologies	• Facilitate coalition building • Establish mechanisms to support member dialogue • Provide infrastructure to support knowledge sharing	• Ability to identify common ground for partners to collaborate • Ability to facilitate the process without controlling it • Ability to support open knowledge sharing

projects (or problems to be solved) is left to individual contributors or community members and tends to emerge organically through member interactions.

Government agencies are currently not playing any role in the TDI network. However, the characteristics of this initiative—community-led, collaborative innovation that can create significant public good—illustrate the potential for the government to play the role of an innovation champion to support and facilitate innovation initiatives in ways that benefit the entire community.

Emergency Management

Another example where such a role is evident is the area of disaster management. Consider the example of the All Hazards Consortium (AHC).[20] AHC is a public-private initiative conceptualized in 2003 by a few government agencies in the states of Virginia, Maryland, and the District of Columbia. It is aimed at adopting a regional approach to natural and terrorist disaster management in the Mid-Atlantic states. The AHC organizes the All Hazards Forum, which brings together private corporations, nonprofits, universities and other educational institutions, volunteer citizens, and government agencies in the Mid-Atlantic states to devise innovative solutions that address key problem areas in the broad areas of disaster management and emergency preparedness.[21]

The lead government agencies that together form the board of directors of AHC play the role of an innovation champion in the network. Specifically, as innovation champion, they carry out three critical tasks:

• Identify potential network members and bring them to the initiative.

• Provide a structure or mechanism for members to conduct dialogue with one another in ways that would lead to the identification of problems to be solved.

• Provide an infrastructure for knowledge sharing among network members and facilitate cumulative knowledge creation or solution development.[22]

Thus, the role of innovation champion emphasizes establishing and supporting a collaborative environment where the varied stakeholders can come together to identify, define, and solve key problems. In the AHC context, the stakeholders include the state or local governments who own the problem; the private sector who owns the assets, technologies, and solutions; the universities who provide the underlying research; and the nonprofits who provide access to critical problem-related information and resources. Importantly, the lead agencies do not set the agenda for the network. The specific problems that need to be tackled emerge through dialogue among the network members and are then dealt with in more detail at technical sessions that involve the key stakeholders. Further, the community members (and not the lead government agency) "own" the solutions that emerge from their discussions that are then taken out for implementation.

Such a network-based, collaborative problem-solving approach assumes relevance only in certain contexts—specifically in contexts where the problems are relatively complex and ill defined, cut across

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About the All Hazards Consortium

The All Hazards Consortium (AHC) is a Maryland nonprofit charitable organization, application for IRS recognition of 501c3 status pending. Donations to the All Hazards Consortium are not tax-deductible for federal income tax purposes. The AHC is guided by the regional states of NC, DC, MD, VA, WV, DE, PA, NJ, and NY. Our mission is to help create new resources and funding opportunities for the states to support regional multi-state collaboration efforts among our stakeholders from government, private sector, higher education, and nonprofit/volunteer organizations.

The All Hazards Consortium was built on the belief that state/local government is ultimately responsible for the protection of the public. Based on this assumption, the AHC sees government as the "owner of the problem." The private sector owns most of the assets, technologies, and solutions; the universities provide research and education to address the problem; and nonprofit organizations provide access to information and people who are focused on a particular segment of the problem. By bringing together all stakeholder groups into regional Advisory Committees, Working Groups, and ad hoc committees, and focusing on specific issues (with state government driving the needs), a powerful environment for collaboration is created to solve tough problems that require resources from every sector.

This "culture of collaboration" is what creates the energy that drives the All Hazards Consortium and its supporters to work together to protect the region's citizens from all types of hazards.

The AHC serves its member states and their local/municipal/tribal governments. In the process, the other stakeholders from private sector, universities and nonprofit/volunteer organizations benefit from the relationships and information sharing efforts.

- **State/local government:** Partner states include NC, VA, WV, DC, MD, DE, PA, NJ, and NY

- **Federal government:** Federal agencies who support the states, including legislators and staff interested in regional homeland security and emergency management issues

- **Non-government:** Private sector firms, higher education, and nonprofit organizations

- **Volunteers:** Private citizens who want to contribute their time and talents to the effort

Source: AHC website (www.ahcusa.org)

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geographic/organizational/domain boundaries, and demand extensive collaboration among a diverse set of stakeholders. The case of the Blackfoot Challenge movement described earlier—and, more generally, the broad area of environmental and energy conservation—is illustrative of such a context.

Health Care Information Technology

Another example that would fit the above criteria is health care, specifically the development and adoption of health information technologies (HIT). The United States currently lags behind other industrialized countries in HIT adoption by at least 10 to 12 years, and this has considerably slowed progress toward realizing the vision of a National Health Information Infrastructure (NHII).[23] Creating innovative solutions to enhance the HIT adoption rate (for example, new business models in health care, new

health care management processes, new health information standards, and new instruments for HIT funding) will require finding common ground among a diverse set of stakeholders that include technology vendors, hospitals and other health care provider organizations, HMOs and health insurance companies, clinicians, and consumers. Although most of the above-mentioned solutions are likely to be implemented in the private or the non-governmental sector, federal and state government agencies have considerable potential to play the role of innovation champion and steer these diverse stakeholders toward solutions that would help to achieve the NHII vision.

In all of the above examples, government agencies have a critical role to play in bringing together network members who own the problem and those who own the solutions, and in facilitating the

building of relationships and partnerships that would lead to the development and implementation of those solutions. Importantly, the agencies' role here is not to "make decisions" but instead to "leverage the actions" of other members in ways that advance the problem-solving process.[24]

Recommendations

The above discussion incorporates three recommendations for government agencies that have the potential to play the role of innovation champion. In this role, there is not a lead agency because innovation leadership is community based.

Recommendation 9: Facilitate coalition building

The government agency should focus on providing diverse opportunities for external partners who "own" the problems and those who "own" the potential solutions to conduct dialogue and build relationships.

Recommendation 10: Refrain from controlling the process

The government agency should refrain from controlling the processes and making decisions, and instead allow the problems and solutions to emerge organically through the continued interactions of the network partners.

Recommendation 11: Provide infrastructure for cumulative knowledge creation

The government agency should invest in and provide appropriate collaboration infrastructure (processes and technologies) to facilitate collective knowledge creation.

Government as Innovation Catalyst

The fourth and final role—government as innovation catalyst—implies a context where an agency's existing services and programs structure the problem space (that is, the problems being solved tend to be defined in terms of existing services). However, the solutions to such problems are reached at collaboratively and "owned" or implemented by the community that has a stake in solving them (including citizens, private companies, and nonprofit agencies). The agency's role is to catalyze such collaborative problem solving by helping to define the problem and sharing with the community the information that would be instrumental for solving it.

Before we examine this role further, consider a similar role in the private sector. In the computer gaming industry, companies that create PC-based video games often make available the source code of such games to the community of gamers, who can then modify and create "mods" or variations of the games. These modifications—which may involve adding new characters, new story lines, and so on—are then distributed for free over the Internet to all community members. Note that while these mods are available free of cost, to play them one would still need the original game, as the mods play on the same game engine.

The benefits from such mods accrue to the community members (for example, more gaming choices and community-based reputational incentives) as well as to the companies who developed the original games (for example, extended product life cycle and larger customer base). This has led to many game developers (such as Epic Games and Valve Software) taking a more proactive approach toward promoting and supporting the innovative activities of the gaming community in ways that open up new

commercial possibilities for the original game as well as enhance the overall gaming experience of the customers.

The innovation context in the gaming example exhibits two key characteristics with significant implications for innovation and problem solving in the public sector. First, it largely involves modifying or complementing an existing product, process, or service, that is, innovation activities that occur within the boundaries of a pre-defined problem space. Second, it is community-led, that is, the entire community shares in the responsibility for coordinating the problem-solving activities and for implementing the final solution. The entity that plays the role of the innovation catalyst offers the context for the innovation (in the example, the PC-based game) and assists the community of innovators by providing appropriate knowledge and tools (in the example, software tools and documentation) for problem solving.

In the public sector context, the role of an innovation catalyst, while relatively nascent, holds considerable potential as a way for the government to engage external partners (particularly citizens and nonprofits) in solving problems that, while related to existing services and programs, might not fall within

	Network Leadership	
	Government-Led	**Community-Led**
Innovation Space — **Emergent**	Innovation Seeker	Innovation Champion
Defined	Innovation Integrator	Innovation Catalyst

Table 5: Characteristics of the Role of the Government as Innovation Catalyst

Nature of the Innovation or Problem	Nature of Network Leadership	Example	Primary Function of the Government Agency	Key Success Attributes
Well-defined problems that relate to and complement but **do not fall** within the lead agency's services/programs	Community-led; diffused; network members share the decision-making powers and co-own the solutions	Developing innovative Neighborhood Watch programs	• Identify problem-solving areas • Provide access to relevant information and resources • Provide access to relevant implementation infrastructure	• Ability to communicate a vision for community-led problem solving • Ability to connect community-owned solutions with existing services

the agency's realm of operations. In such contexts, community-owned solutions may coexist with, as well as complement or enhance the value of, the related services of the agency.

Volunteer Initiatives

Consider the case of Citizen Corps, the federally funded program aimed at creating opportunities for individual citizens to volunteer to help their communities prepare for emergencies. Much of the focus so far has been on educating citizens on emergency preparedness and equipping them for volunteer activities related to homeland security and disaster management. The initiative may also provide the context for government agencies to catalyze community-led problem solving in areas such as crime prevention and local law enforcement. However, to make that happen, the relevant government agencies will need to make a departure from their current approach that is focused on education and training and adopt practices that reflect the essence of the innovation catalyst role.

For example, one of the components of Citizen Corps is the Neighborhood Watch program. By and large, the program trains citizens in crime prevention techniques and facilitates the reporting of crime and suspicious activities in local communities. The next generation of the Neighborhood Watch program may involve facilitating citizen-led collaborative problem solving. The local law enforcement structure that exists as part of the services offered by the government would define the problem space for a

community of stakeholders (such as citizens and nonprofits) to collaborate and create innovative solutions that address issues of particular importance or relevance to them.

As an innovation catalyst, the role of a government agency (say, the city police department in this example) will be threefold:

• Attract the "right" set of community members and share with them a vision of the opportunities that exist for community-led problem solving.

• Provide access to relevant background information and resources that would help the community members "discover" the problems and formulate innovative solutions.

• Facilitate the implementation of those community "owned" solutions by providing appropriate access to the existing service or program infrastructure.

The Citizen Corps

The Citizen Corps initiative is part of the USA Freedom Corps (USAFC) program that the U.S. federal government launched in January 2002 to promote a culture of service, citizenship, and responsibility in America. The USAFC, housed at the White House, facilitates volunteer service in America by partnering with national service programs, working to strengthen the nonprofit sector, recognizing volunteers, and helping to connect individuals with volunteer opportunities. For more details on USAFC, visit www.usafreedomcorps.gov.

Neighborhood Watch Programs

One of the oldest crime prevention programs, Neighborhood Watch was created to unite law enforcement agencies, private organizations, and individual citizens in a massive effort to reduce residential crime. The program is administered by the National Sheriffs' Association, a nonprofit organization, in conjunction with several federal agencies including the Department of Justice. For more details, visit www.usaonwatch.org.

Note that while the solutions might be "owned" and implemented by the community, they would still need to operate within the parameters defined by local law enforcement.

In sum, the innovation catalyst role implies the potential for government agencies to go beyond the current "education" focus in initiatives such as Citizen Corps and adopt an innovation or problem-solving focus so as to facilitate community-led collaborative efforts in areas where the problems and their solutions complement and enhance the value of existing government services and programs.

Recommendations

Government agencies that intend to pursue the role of innovation catalyst should consider the following three recommendations.

Recommendation 12: Identify opportunities for community-led problem solving

The government agency should conduct an internal assessment and identify the areas (related to its existing services/programs) where community-led problem solving would be feasible and valuable and communicate that to relevant partners.

Recommendation 13: Establish processes for knowledge sharing

The government agency should establish appropriate internal systems and processes to identify information that would be relevant for the problem solving and to share such information with the community members.

Recommendation 14: Facilitate implementation of community "owned" solutions

The government agency should establish appropriate budgets to support or facilitate the implementation of community "owned" solutions.

Success Factors in Collaborative Innovation

The diversity of the collaborative innovation roles described in this report implies the need for government agencies to develop new and different types of capabilities and competencies. In this section, some of the important success factors in collaborative innovation are identified.

Success Factor 1: Cultivate a Culture of Openness

For network-based approaches to succeed, it is equally important for the government agency to cultivate a *culture of openness* and embrace external entities as true partners in innovation and problem solving.

First, for external innovative ideas to flourish inside an organization, the critical challenge is to overcome the "not-invented-here" (NIH) or the "we-know-everything" (WKE) syndrome. Many private companies, including DuPont, Kodak, and 3M, with rich and long histories of internal technological achievements have faced such a challenge—an organizational mind-set that is closed to external ideas and knowledge because of the belief that internal knowledge and expertise is sufficient and there is no need for importing external expertise. Overcoming such a mind-set requires explicitly identifying areas within the agency where external innovative contributions would be most valuable and bringing more transparency to the associated internal systems and processes so that external partners can identify opportunities for collaboration and make appropriate contributions.

Second, government agencies would also need to develop the ability to "let go" and involve external partners in decision making when appropriate. This is likely to be particularly challenging for those

agencies used to controlling every aspect of their service or operational agenda. They would also need to be comfortable with sharing information with external partners. In many government agencies, such "proprietary" information is often hoarded and rarely shared with even peer agencies. As such, the notion of sharing that with external partners (for example, citizens) is likely to be particularly difficult to comprehend for many organization members and would call for concerted effort in organizational change from agency heads.

Success Factor 2: Create the Right Organizational Structure

Another important aspect of success relates to whether the government agency has the right organizational structure to participate in collaborative problem solving. There are two key questions to be answered here. First, does the agency need a dedicated unit to lead its network-based collaborative initiatives? Second, should there be staff assigned with the responsibility of leading all such efforts within the agency?

Need for a dedicated organizational unit: In the private sector, while some companies (such as Dial and Procter & Gamble) have established dedicated units to spearhead their network-based innovation initiatives, some others (such as 3M and IBM) have not. Drawing on their experience, government agencies can receive guidance on this issue by considering three questions.

1. Does the agency have a history of collaborating with external networks—either in operations or in problem solving? If so, it can rely on transforming one or more existing units that

already have the experience to take on the new responsibilities related to leading and coordinating the collaborative problem-solving initiatives.

2. Is the nature of the problem the agency wants to focus on clearly defined or more emergent in nature? And how diverse are the innovation partners likely to be—is it just private corporations or citizens and nonprofits as well? Typically, the effectiveness of a central dedicated unit to coordinate activities will be high when the diversity of the partners is low and the problem space is clearly defined. When the problems are ill defined or emergent and the partner network is diverse, the dedicated unit may act less as a process enforcer and more as a clearinghouse for best practices and skills.

3. Are the initiatives being considered by the agency related to its existing programs and services or to radically new services? If it primarily relates to existing services, then there is more

value in establishing a central coordinating unit to connect the external partners with specific internal units that are involved in the day-to-day operations of those services.

Need for a chief innovation officer: It is clear from the discussion so far that the effort to address the cultural challenges (for example, more openness or transparency) should come from senior leaders of the government agency. Some private corporations have explored the role of a chief innovation officer (CIO) to champion such an organization-wide mindset and cultural changes and to communicate the organization's commitment to collaborative innovation initiatives. The need and the value of such a CIO position in the government sector may vary from agency to agency. For example, it may be appropriate in an agency where collaborative problem-solving approaches are likely to be the dominant model of innovation or reform. Further, if the organization is likely to be partnering with a

Table 6: Success Factors Needed in Collaborative Innovation

Collaboration Capabilities	Innovation Integrator	Innovation Seeker	Innovation Champion	Innovation Catalyst
Cultivate a Culture of Openness	Ability to **integrate partners** as part of extended organization	Ability to **embrace non-traditional partners** (and their ideas) in innovation and problem solving	Ability to **play supportive roles** without "controlling" activities	Ability to **share "proprietary" information** to support community-led projects
Create the Right Organizational Structure	Ability to **establish and maintain agency-wide relationships**	Ability to **bring coherence** to diverse partner relationships	Ability to **identify and promote best practices**	Ability to **identify and channel agency resources** to external communities
Develop Appropriate Leadership and Relationship Skills	• Ability to create a **level playing field** for external partners • Ability to **devise and communicate** a shared set of goals and values	• Ability to **enhance partner commitment** to innovation • Ability to **minimize perceptions of power asymmetry**	• Ability to **give "voice"** to diverse sets of stakeholders • Ability to **facilitate development** of a shared set of goals	Ability to **nurture community-led problem solving** by providing visibility to key problem areas
Adopt a Portfolio of Success Metrics	• **Capabilities and reputation** of partners • **Trust and commitment** among partners • **Clarify** innovation goals	• Number of **external ideas** sourced • Number of **new services/programs** generated from external ideas • Number of **partners**	• **Turnover** in innovation community • Extent of **consensus building** • **Speed** of problem identification	• **Intensity** of activity in the community • **Value-added to existing services** and programs

diverse set of partners, the role of the CIO might be particularly helpful for establishing a coherent set of relational practices and processes. Whether or not an agency appoints a CIO, it is quite apparent that the agency head and other senior leaders must take the helm in creating a culture of collaboration and openness that is central to the success of such collaborative problem-solving approaches.

Success Factor 3: Develop Appropriate Leadership and Relationship Skills

Two issues dominate the leadership and relationship skills the government agency must build to be successful. First, in most collaborative problem-solving initiatives that the government gets involved in, there is likely to be significant *asymmetry in power and resources*—between the larger, more resourceful government agency and the smaller, less resourceful external partner (such as nonprofits and citizens). In such contexts, the agency may need to project an image of decisiveness or support without implying a high-handed approach to decision making. Achieving this will require considerable effort in educating the officers in the agency with regard to their day-to-day interactions with the partners.

Second, the ability of the agency to build *trust-based relationships* with diverse partners is equally important. The mechanisms for building such trust would, however, vary with the type of partner. For example, an agency playing the role of innovation integrator—and interacting largely with private corporations—will need to enhance the overall transparency in the innovation processes and decision making in order to build trust-based relationships with its partners. The primary objective here would be to provide a fair playing ground for all the partners. On the other hand, in interacting with volunteer citizens (who contribute innovative ideas), open communication and quick feedback on their ideas are likely to be more important in building trust. Thus, the agency's ability to identify appropriate mechanisms to build trust in different contexts can critically shape its success in collaborative innovation.

Success Factor 4: Adopt a Portfolio of Success Metrics

All of the above capabilities will come to naught if the agency is not able to monitor and measure the performance of its collaborative innovation initiatives. It is widely acknowledged that in the public sector there is greater emphasis on measuring inputs than on evaluating outputs. Measuring success in network-based problem solving will, however, require the adoption of a *portfolio of success metrics* that relate to both inputs as well as outputs—and, more importantly, to both network-level and agency-level performance factors.

Success metrics that relate to the overall network allow a government agency to evaluate whether it is partnering with the "right" network. For example, for an agency that is playing the role of an innovation seeker, a valuable metric would be the reach and geographic scope of its network— say, the number and diversity of citizens or nonprofits that the agency has been able to reach out to. Similarly, for an agency playing the role of innovation champion, a useful measure would relate to the stability of the external community—the number of members in the community as well as the average turnover in membership.

Success metrics that relate to the impact of the collaboration on the agency are equally important. Illustrative questions to ask include:

- How well does the agency implement innovative ideas and solutions sourced from outside (say, from citizens)?

- How many of such external ideas have led to the introduction of new (or improved) services and programs?

- How well do the community-led innovation projects complement the agency's service portfolio?

Connecting the success metrics with existing services and programs enables better evaluation of the agency's investments and efforts in collaborative problem solving, particularly when the outcomes are spread across time and organizational boundaries.

Given that each measure provides a unique view of success in network-based collaborative innovation, it is imperative that agencies adopt a *portfolio of success metrics*. Importantly, the selection of the metrics should reflect the agency's desired focus and role in the collaborative initiatives.

Implementing Collaborative Innovation and Problem Solving

The report concludes with a set of three recommendations to senior managers of government agencies with regard to implementing collaborative innovation and problem-solving initiatives.

Recommendations

Recommendation 15: Determine the appropriate problem-solving role for the agency

Government agencies should first conduct a critical assessment of their broader service or program goals and priorities and the types of problems that are visible in the broad landscape in which they operate. Illustrative questions include:

- Are these problems well defined or more emergent in nature?

- Who "owns" these problems—the agency or external stakeholders?

- Will the potential solutions to such problems become part of or only complement the agency's services?

- What is the nature of the contributions (such as expertise and coordination) that the agency could make toward solving the problems?

The deliverables of this analysis should be an explicit acknowledgement of (1) the nature of the problems that need to be tackled through the network-based collaborative approach and the desired outcomes, and (2) how the agency intends to translate such outcomes into public good in terms of new services, programs, technologies, and the like.

Based on the above deliverables and the framework presented in Figure 1 (see page 13), the government

agency should (1) select one of the four collaborative problem-solving roles described in this report, and (2) develop a clear vision of how it is going to play that role. This requires making explicit the specific responsibilities and activities of the agency in that role.

Many large private companies (such as Procter & Gamble, Dial, and Staples) have conducted similar analyses of their innovation goals and objectives to identify appropriate roles in network-based collaborative innovation. As some of these companies have discovered, different approaches may be found to be appropriate for different divisions or units within the same company. Similarly, a government agency may also discover the relevance of different types of collaborative problem-solving roles in different parts of its service/program portfolio.

Recommendation 16: Clarify the parameters of external collaboration

Agencies should bring clarity to the parameters of collaboration. Specifically:

- What are the broad parameters on which the government agency is committing itself to explore collaborative problem-solving approaches?

- Are there certain approaches that the government agency will not pursue? Is the agency ready to collaborate with non-traditional partners (for example, citizens or independent inventors)?

- How much control and influence is the agency willing to "let go" in these initiatives?

- Will the collaborative approach be broadly applied across the agency's service portfolio or limited to certain parts of the portfolio?

Addressing such questions early on helps government managers evaluate the extent of organizational commitment to collaborative approaches and also understand the "hows" and the "whys" that underlie such commitment.

Decisions on this should be taken carefully after considering the agency's particular history, public goals and agenda, organizational structure, and so on. The objective should be to: (1) identify the most relevant and valuable external partner for problem solving, and (2) to define the nature of partnerships that would be acceptable. Senior managers should assume the responsibility to communicate this effectively to all corners of the organization.

Recommendation 17: Invest in building the infrastructure to support the agency's role

Agencies should conduct an assessment of their capabilities and competencies vis-à-vis the role they plan to play in the collaborative initiative. Based on this assessment, they should take appropriate measures to establish the right process infrastructure and the technological infrastructure as recommended below. It is important that the resource requirements for building such infrastructure be incorporated into relevant project or program budgets early on.

Establish the Right Process Infrastructure:

Government agencies will need to establish appropriate processes to support their external collaboration activities. The first focus should be on the *selection of the services or programs* where the external sourcing of innovative ideas would be most valuable for the agency. What is the nature of the value addition that the agency expects from external partners? How would such contributions enhance the specific services or programs? Another focus should be on the *selection of external partners*. Processes established here should aim to bring a level of coherence to such decisions across the agency. Many government agencies have considerable experience in one-on-one relationships with external partners but limited experience in dealing with a wider network of partners.

Processes are also required for *identifying and managing the risks* associated with collaborative problem solving. Participating in community-led projects poses different types of risks compared to participating in government-led projects. Similarly, collaborating with citizens implies certain types of risks that might not exist in partnering with private corporations. For example, in entertaining ideas and solutions from citizens and independent inventors, there are likely to be intellectual property–related risks, and hence processes might need to be instituted to mitigate these risks. Also, some of the relationships that agencies establish might hold potential legal implications. For example, interactions with private companies have to be carefully carried out, even in community-led problem-solving projects, to adhere to government contracting laws. Managing such risks might involve creating a buffer zone between the agency and the private companies—say, through the establishment of a 501(c)(3) organization that includes members from both sides.

Establish the Right Technological Infrastructure:

An appropriate technological infrastructure is of paramount importance in ensuring the success of collaborative problem solving. Over the past few years, a wide range of information technology (IT)-based tools have emerged that can help government agencies enhance the overall transparency and visibility of their collaborative activities. Some of these tools facilitate communication and knowledge sharing among network members while some other tools support coordination and management of collaborative processes.

The virtual Global Collaboration Environment that Boeing established for its 787 development partners shows the benefits of such an IT-based infrastructure, particularly in the context of the innovation integrator role. Similarly, recent examples of Web 2.0 technologies and solutions used to reach out to volunteer citizens (the Web Lab at www.weblab.org and Transit Camp at www.transitcamp.org) indicate the value of IT-based infrastructure to support open dialogue among diverse partners. The more integrated the tools are with the underlying problem-solving processes in the network and the capabilities of the partners, the greater the potential returns from such tools. Thus, government agencies should devise and establish integrated IT infrastructures that would embrace their network partners as part of the extended organization and bring coherence to their activities and contributions.

Looking Ahead

The performance of American government in the 21st century will be shaped by how well it adopts collaborative innovation to harness external resources and creativity in addressing the nation's most challenging issues.

The promise and the potential of a network-based collaborative approach to innovation and problem solving have been well demonstrated in the private sector in recent years. The objective of this report has been to discuss how some of the very same approaches that have found success in the private sector can be applied in the public sector.

It is hoped that by bringing more clarity to the different collaborative approaches and their pre-conditions for success, this report will help government agencies at every level—federal, state, and local—evaluate and pursue opportunities to engage diverse external partners in collaborative innovation initiatives.

Endnotes

1. Visit the website www.blackfootchallenge.org for more details on the objectives of this community-led initiative and the results realized so far.

2. The Blackfoot Challenge has received numerous awards in recent years including the Innovations in American Government Award from the Ash Institute for Democratic Governance and Innovation at Harvard University.

3. For more details on the Toronto Transit Camp, visit www.transitcamp.org.

4. Also read M. Abramson, J. D. Breul, and J. M. Kamensky, "Six Trends Transforming Government," IBM Center for The Business of Government, 2006.

5. D. F. Kettl, "The *Next* Government of the United States: Challenges for Performance in the 21st Century," IBM Center for The Business of Government, 2007.

6. S. Nambisan and M. Sawhney, "The Global Brain: Your Roadmap for Innovating Faster and Smarter in a Networked World," Wharton School Publishing, October 2007.

7. S. Goldsmith and W. D. Eggers, "Governing by Network," Brookings Institution Press, 2004, p. 8.

8. Also read S. Goldsmith, "Can business really do business with Government," *Harvard Business Review,* May–June 1997.

9. S. Goldsmith and W. D. Eggers, 2004, p. 25.

10. Also see S. Nambisan and M. Sawhney, 2007, p. 35.

11. The phrase "Architecture of Participation" was originally coined by Tim O'Reilly (see http://tim.oreilly.com/articles/paradigmshift_0504.html).

12. This figure is adapted from S. Nambisan and M. Sawhney, 2007, p. 57.

13. "Sharing the Dream," *Boeing Frontiers* (August 2006).

14. "Staples Turns to Inventors for New Product Ideas," William Bulkeley, *The Wall Street Journal* (July 13, 2006; B1).

15. D. F. Kettl, 2007, p. 15.

16. For more on citizen engagement models and frameworks, read C. Lukensmeyer and L. H. Torres, "Public Deliberation: A Manager's Guide to Citizen Engagement," IBM Center for The Business of Government, 2006.

17. For more details, visit www.neighborhoodamerica.com.

18. "Klein specifies restructuring of city schools," David Herszenhorn, *The New York Times,* April 17, 2007.

19. For more details on TDI, visit their website at www.tropicaldisease.org. Also read, S. M. Maurer, A. Rai, and A. Sali (2004). "Finding Cures for Tropical Diseases: Is Open Source an Answer?" *PLoS Medicine* 1(3):56; doi:10.1371/journal.pmed.0010056.

20. Visit the AHC website at www.ahcusa.org.

21. Information about the All Hazards Forum and its annual conferences and reports are available at www.allhazardsforum.com.

22. Author's interview with John Contestabile, chairperson of the All Hazards Consortium on August 14, 2007.

23. G. F. Anderson, B. K. Frogner, R. A. Johns, U. E. Reinhardt, "Health care spending and use of information technology in OECD countries," *Health Affairs,* 2006, 25(3): 819–31.

24. D. F. Kettl, 2007, p. 14.

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Satish Nambisan is Associate Professor of Technology Management & Strategy in the Lally School of Management & Technology at Rensselaer Polytechnic Institute. A widely recognized researcher and thought leader in the area of technology and innovation management, he also holds a joint appointment with the IT Program in the School of Science at RPI.

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Mark A. Abramson and Paul R. Lawrence, editors

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