## FROM IDEA TO IMPLEMENTATION: MEASURING THE IMPACT OF INNOVATION ACTIVITIES IN GOVERNMENT



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## Increasing Innovation in Government

Government organizations are increasingly recognizing the need to innovate to more effectively fulfill their missions. Agencies across government are seeking new approaches and solutions to challenges such as improving services for citizens, countering growing capabilities of foreign adversaries, and adapting to the accelerating rate of technological change.

Public sector organizations are adopting many of the approaches and techniques that have served as innovation catalysts for industry. For example, government organizations are providing maker spaces, sponsoring challenges, and hosting networking events. Organizations are creating new positions such as Chief Data Officer and Chief Innovation Officer. Government agencies are also creating new offices and affiliating with organizations focused on accelerating the development and adoption of innovative tools and practices.

As government innovation organizations proliferate, so is interest in measuring their results. Appropriate metrics enable organizations to track progress, identify their most effective activities, and communicate results and value to both the creators and consumers of innovative solutions. Moreover, metrics can drive the direction of an organization. Measures that are properly aligned with an organization's mission and role improve its chances of achieving success, whereas misaligned or superficial metrics increase the probability that an organization will veer from its intended purpose. Researchers from The MITRE Corporation investigated how government-focused innovation organizations advance innovation and evaluate their results. The research collected information from nearly 40 government innovation organizations to understand their roles, activities, and measures of success.<sup>1</sup>

# The Government Innovation Landscape

Historically, innovation in government has come from organizations such as laboratories, federally funded research and development centers (FFRDCs), and contracted commercial vendors. More recently, agencies have created or partnered with smaller organizations dedicated to increasing innovation. Those organizations – typically operated by the government or non-profits – are responsible for pursuing multiple paths to innovation.

Government innovation organizations now support a wide range of agencies, missions, and technical domains. These organizations foster innovation through various roles, depending on the needs and desired outcomes of their customers. Although government innovation organizations primarily support their parent organization, some also provide services to other government agencies. Partnerships and collaborations among innovation organizations are common.

Despite growing interest in the government innovation ecosystem, there is currently no comprehensive directory of innovation

<sup>&</sup>lt;sup>1</sup> This document is an abbreviated summary of the research performed; a full report is undergoing peer review for publication. To access the full report, please contact Dr. Justin F. Brunelle (jbrunelle@mitre.org).

organizations. Consequently, the burden of discovering innovation organizations and their capabilities largely falls on potential customers, users, and partners. While multiple attempts to map and characterize government innovation organizations are underway, the rapidly changing environment exacerbates the challenge of staying current on the innovation resources available to government agencies.

## Types of Government Innovation Organizations

There are seven distinct types of government innovation organizations, categorized based on their roles in promoting and implementing innovation. **The different types of government innovation organizations typically support different stages of the innovation process, as solutions move from ideation to development to wide-scale adoption** (Figure 1). For example, developer organizations focus on the early innovation process steps of design, prototyping, and testing. Accelerator organizations, in contrast, focus on rapidly increasing adoption of innovative solutions towards the end of the process. Networker and educator/advisor organizations have roles that are consistently valuable across all stages of the innovation process.

MITRE found that networkers are the most common type of innovation organization supporting government, followed by educator/advisor organizations (Figure 2). Developers and accelerators are the least frequent types of organizations in the government innovation ecosystem. The prevalence of different types of innovation organizations may reflect the relative demand for their services. However, the frequencies could also indicate that innovation organizations with minimal resources may be more likely to fill roles that do not require high levels of funding or staffing. Innovation organizations are often significantly smaller in both budget and staffing levels than national labs and FFRDCs.

#### Figure 1: Types of Innovation Organizations and Their Roles in the Innovation Process



Figure 2: Types and Prevalence of Government Innovation Organizations



Government innovation organizations frequently perform multiple roles and are not restricted to a single category. For example, MITRE found that most investor organizations also perform a networker function, and many accelerators also facilitate acquisition.

The blending of multiple roles within a single innovation organization may be the result of leveraging common activities and expertise across categories (e.g., a hackathon is a design exercise and a networking event). Organizations fulfilling multiple roles may also be able to provide end-to-end support to propel solutions through all stages of the innovation process. Another possible explanation is that relatively new government innovation organizations are performing a variety of activities to discover what resonates with their customers and will narrow their focus on specific aspects of innovation as they become more established.

## Activities Performed by Government Innovation Organizations

Government innovation organizations perform a variety of activities to advance innovation. These activities typically align to the organizations' multiple roles and the needs of their customers. Organizations' activities also inform their selection of metrics.

All activities performed by government innovation organizations fall into five broad categories:

- **FINANCIAL ACTIVITIES** providing funding for any stage of the innovation process.
- OUTREACH AND NETWORKING ACTIVITIES engaging and collaborating within and across organizations and domains.
- TECHNICAL ACTIVITIES creating and improving innovative solutions.
- CONTRACTING ACTIVITIES helping organizations acquire products and services.
- INFORMATION GATHERING AND SHARING ACTIVITIES – researching and propagating innovative approaches and thinking.

MITRE's research indicates that **the most frequent** activities across all types of government innovation organizations are networking events and providing funding (Figure 3). Other common activities include providing coaching and guidance, technical assessments, and contracting facilitation.

The five most common activities each fall within a different activity category, indicating that government innovation organizations offer a wide range of activities.





Although MITRE did not ask organizations to distinguish which activities they perform specifically for each of their roles, **certain categories of activities appear to be more prevalent among certain types of organizations** (Figure 4). For example, technical activities are most frequently associated with developer organizations; contracting activities are most frequently associated with acquisition facilitator organizations. Conversely, all types of organizations regularly perform networking and outreach activities. Although these activities are most closely tied to networker organizations, all types of innovation organizations typically have a networking or outreach component to their operations.

#### Figure 4: Categories of Activities Typically Associated with Types of Innovation Organizations

		INNOVATION ORGANIZATION TYPE						
		cator or Ivisor	worker	eloper	/estor	uisition İlitator	ubator	lerator
ACTIVIT	γ	Educ	Net	Dev	<u>e</u>	Acq Fac	Inc	Acce
Financial								
Outreach	a & Networking							
Technical	I							
Contract	ing							
Informat	ion Gathering & Sharing							

## Metrics Collected by Government Innovation Organizations

Tracking metrics enables organizations to establish and communicate their priorities and evaluate their performance. Relevant metrics also help demonstrate an organization's value to its customers. MITRE found that metrics collected by government innovation organizations fall into four categories, each measuring a different aspect of the organization's activities or results (Figure 5). Each of these categories has multiple examples of metrics that are currently used by government innovation organizations.

WORKLOAD METRICS	ENGAGEMENT METRICS					
Measure incoming work and ongoing efforts, often in terms of projects, customers, or funding.	Measure success in generating participation, awareness, and collaboration through activities such as networking, partnering, social media outreach.					
<ul> <li>Number of Projects - counts programs, products, pilots, etc.</li> <li>Costs - measures financial obligations via budgets, costs per project, etc.</li> <li>Number of Events - counts networking events, hackathons, challenges, workshops, etc.</li> <li>Number of Customers - counts organizations or individuals employing innovation organizations</li> </ul>	<ul> <li>Number of Participants - counts individuals or organizations participating in innovation activities</li> <li>Number of Partners - counts partnerships with other organizations</li> <li>Number of Virtual Participants - counts virtual participation, social media followers, contributors, etc.</li> <li>Diversity of Customers or Innovators - measures breadth based on organization, domain, etc.</li> </ul>					
OUTPUT METRICS	OUTCOME METRICS					
Measure success in delivering information, products, and services to users. Metrics typically track the type of deliverable, frequency, and timeliness.	Measure the impact of solutions that are delivered to users, such as cost savings, mission effectiveness, patient health, or customer satisfaction.					
<ul> <li>Number of Transitions - counts transitions of solutions to users, in terms of new programs of record, consignments of tools, etc.</li> <li>Number of Knowledge Transfers - counts transitions of new insights, ideas, or practices to users</li> <li>Adoption Rates - measures extent of a transition's adoption in a user community</li> <li>Time to Transition - measures time required to provide a solution to users</li> <li>Number of Contracts Awarded - counts contracts awarded as a result of efforts by innovation organizations</li> <li>Number of Reports or Guidance Released - counts publications for internal use or external release</li> <li>Number of Gaps Informed - counts instances when innovation organizations pass along information or solutions that directly addressed a user need</li> </ul>	<ul> <li>Mission Impact - measures contributions of innovative solutions to user's mission success</li> <li>Costs Saved - measures dollars saved due to solutions</li> <li>Success Stories - anecdotes describing benefits of innovation organization efforts</li> <li>Number of Startups Created - counts number of new businesses or organizations that arose from innovation organization efforts</li> </ul>					

#### Figure 5: Categories of Metrics and Examples Currently Used by Government Innovations Organizations

Most government innovation organizations collect multiple metrics to track their activities and evaluate their performance. MITRE's research reveals that organizations most frequently collect output measures, followed by engagement and then workload metrics. Outcome metrics are the least common (Figure 6).

Most metrics reported by innovation organizations involve some type of count, including the three most frequently used measures: number of transitions, number of projects, and number of participants. Other common counting metrics included the number of partners and the number of knowledge transfers (a measure similar to the number of transitions but pertaining to concepts and practices rather than products). Counting metrics can often be collected immediately and do not require significant resources or follow-up. Counting metrics typically provide the most insight when they are used to track trends over time or are compared to established benchmarks. Outcome metrics are critical to connecting the activities of innovation organizations to the missions and goals of their parent organizations, despite being the least prevalent among government innovation organizations. Ultimately, the value of an innovation organization is measured by its ability to generate positive outcomes for its users. In order to establish effective outcome metrics, an organization must translate its mission into indicators of success and create processes for ongoing data collection and analysis. Innovation organizations have the added challenge of coordinating with the end-users of innovative solutions to capture outcome metrics, possibly for a period well after the innovation organization has transitioned its solution.

Government innovation organizations recognize their shortfalls in metrics collection. Many organizations believe their current metrics are insufficient and they understand their metrics are not adequately tailored to their mission space. This dissatisfaction likely reflects the difficulties in selecting and capturing meaningful outcome measures.



#### Figure 6: Metrics Collected by at Least Ten Percent of Government Innovation Organizations

### **Recommended Metrics for Innovation Organizations**

Innovation organizations should identify and collect metrics that provide insight on their workload, reach, productivity, and impact. Metrics should align with the organization's role and, most importantly, measure its contribution to intended outcomes.

Organizations should avoid collecting metrics solely because of convenience or to fulfill bureaucratic requirements; such measures may incentivize activity contrary to its goals.

Organizations should also consider the costs and benefits of collecting specific metrics and normalize metrics when possible to control for differences in scale. For example, an organization with a larger budget would presumably transition a greater number of innovations than a similar organization with a smaller budget.

Based on the findings and observations made over the course of this research, MITRE also recommends specific, commonly used metrics for each category of innovation organization (Figure 7). While some measures pertain to specific innovation organization types, all organizations should collect metrics from each of the four metrics categories. Note the mission impact outcome metric is recommended across all types of organizations.

Additional details and examples of recommended metrics can be found in MITRE's full report.

MITRE recommends the various types of government innovation organizations focus on measuring the following aspects of their operations:

- EDUCATOR/ADVISOR METRICS the breadth and effectiveness of imparting knowledge, providing guidance, and affecting organizational culture.
- NETWORKER METRICS the frequency, breadth, and results of in-person and virtual interactions across technical domains, locations, and organizations.
- DEVELOPER METRICS the effectiveness of the development process and the impact of the solutions transitioned to users.
- INVESTOR METRICS the output and impact of funded projects.
- ACQUISITION FACILITATOR METRICS the number and speed of contracts awarded and the resulting impact on mission effectiveness.
- INCUBATOR METRICS the effectiveness in maturing innovative ideas into solutions that can be transitioned to users.
- ACCELERATOR METRICS effectiveness and speed of identifying and engaging with possible users; as well as the impact of transitioned products, services, and processes.

			INNOVATION ORGANIZATION TYPE				/PE		
			ator or visor	vorker	eloper	estor	isition itator	bator	erator
	MEASUREMENT CATEGORY	RECOMMENDED METRIC	Educa	Netv	Deve	Inve	Acqu Facil	lncu	Accel
Workl	Washland	Number of Events							
	workload	Number of Projects							
E		Number of Participants							
	Engagement	Number of Partners							
		Diversity of Projects/Participants/Partners							
	Output	Number of Transitions							
		Adoption Rate							
		Time to Transition/Contract Award							
	Outcome	Participant/Customer Satisfaction							
Outcome	Outcome	Mission Impact							

Figure 7. Recommended Metrics Based on Type of Government Innovation Organization

## Recommendations for Government Innovation Organization Processes

In addition to recommendations on metrics to collect, MITRE identified procedural recommendations for government innovation organizations. Innovation organizations – particularly those early in their lifecycle – can improve their impact by following several best practices and lessons learned from the government innovation ecosystem.

Innovation organizations should clearly establish their roles in advancing innovation. The diversity of roles accentuates the importance for organizations to establish and communicate the types of services they provide. Clearly characterizing the functions of an innovation organization helps broadcast its value and capabilities to potential customers and users. A well-defined role also enables organizations to select the most appropriate activities and metrics. Innovation organizations should track metrics and coordinate data collection as part of their regular operations. MITRE observed that metrics selection and collection was ad hoc or underdeveloped for many participating organizations. Establishing a process for collecting metrics early in the life of an organization provides valuable feedback from users and helps identify the most effective activities for that organization. In particular, tracking outcome metrics typically requires that innovation organizations regularly follow up with their users. This communication helps ensure that innovation organizations are continuously aligned with users' missions.

Innovation organizations should be transparent with their metrics through APIs, publications, or other open reporting. Metrics transparency communicates organizational goals to the innovation community – including customers, users, and employees – and allows them to track progress. Transparency also helps end users understand their role in measurement and may encourage user organizations to be more willing to collect and provide the appropriate data.

Innovation organizations should coordinate to build and maintain a directory of innovation services available within the government. As the government innovation ecosystem expands, organizations should make their roles and capabilities evident to the community. MITRE observed a lack of clarity regarding the services innovation organizations provide and how to engage them. The rapid growth in the number of innovation organizations exacerbates the challenge of maintaining awareness of players and services in the space. Future efforts should focus on a service for self-registry, advertising, and discovery of government innovation organizations by customers, peers, users, and potential partners. The directory will also provide a platform for organizations to share metrics and best practices for measuring innovation.

### **Summary**

Departments and agencies across the government are increasing their emphasis on innovation. As a result, organizations dedicated to fostering government innovation have proliferated. These organizations encourage new approaches and solutions through a variety of activities, such as prototyping, collaboration, and competitions for funding. As the government allocates increasing resources to innovation, questions arise as to how innovation organizations measure their performance, and ultimately, their effectiveness in supporting government missions.

Researchers from The MITRE Corporation assessed how government-focused innovation organizations advance innovation and evaluate their results. The research team collected information on 39 government innovation organizations to understand their roles, activities, and measures of success. MITRE found that most government innovation organizations collect metrics, but most organizations. also did not believe that their metrics were sufficient. The metrics used most frequently by innovation organizations were counts of the numbers of customers, participants, and instances when solutions were transitioned to users. While these types of metrics are useful for tracking an organization's workload and output, they do not measure outcomes or impact. Outcome metrics were not commonly collected by innovation organizations, possibly a consequence of the challenges of connecting an organization's activities to desired outcomes and capturing appropriate data. MITRE recommends that innovation organizations focus on identifying and collecting outcome metrics that are critical to aligning innovation activities and products with government missions.



