



# Advancing AI in Federal Government

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**A**rtificial Intelligence (AI) is a hot topic with many implications for government service contractors. That's why the Professional Services Council is advocating for guiding principles that will make AI implementation successful across the federal government.

Successful application and integration of AI across the federal government requires four lines of effort:

- An understanding of available existing and future technology;
- How that technology can serve government needs;
- Coordinated agency planning, and;
- Identifying and empowering change agents to facilitate rapid adoption of these emerging technologies.

Contractors have critical roles to play across all four of these lines of effort, but in this article, I will focus on the last two as federal agencies and their supporting contractors work together to advance AI in government.

### Coordinated Agency Planning

Should the government's approach to developing and implementing AI solutions be driven from the top down, from the bottom up, or both? In my view, it is a balance of both.

For changes of this magnitude and duration, we need department leadership at the top providing strategic direction, support for adequate resources, and a safe environment for new ideas. That's the top-down approach.

For the operators, we also need to make sure recommended solutions at the ground level make sense. That's the common-sense, bottom-up approach in which end-users interface with technology to perform their jobs.

Why do we need both? Evidence, experience, and history show that efforts at the ground level will likely fail in the face of institutional resistance and alignment disconnect without top cover and strategic direction.

Contractors can bridge the two through the first two lines of effort, by understanding available technology and the needs of the people in the field, as well as the broader strategic framework within which both the government and its supporting companies have to operate.

### Top-Down Action Underway

The White House is already moving in this top-down approach on a more macro level. In May, the White House convened a summit on artificial intelligence (AI)<sup>1</sup>, an encouraging sign of American government and industry collaborating to advance this transformative technology.

At the same time, the White House established a select committee to improve coordination of Federal efforts related to AI. On June 27, two subcommittees were formed<sup>2</sup> to focus on implementing actions in Machine Learning and AI (MLAI), and the Networking and Information Technology Research and Development (NITR). These implementation-focused subcommittees further demonstrate commitment by the White House to promote action of ideas.

### A Sense of Urgency

How can government encourage adoption of AI solutions in institutions resistant to change? It is incumbent on leadership to instill a sense of urgency.

<sup>1</sup> <https://www.whitehouse.gov/wp-content/uploads/2018/05/Summary-Report-of-White-House-AI-Summit.pdf>

<sup>2</sup> <https://www.nextgov.com/emerging-tech/2018/06/heres-what-white-houses-ai-committee-will-focus/149382/>

America's defense leadership has shown that it already grasps the critical importance of harnessing the power of AI for national security. Defense Secretary Jim Mattis recently told a Congressional committee that the Department of Defense (DoD) is "not going to have more papers, we're going to move." DoD is broadly pursuing

## NDA PROVISIONS ON AI

Congress has recognized the need for action on and integration of artificial intelligence by including a series of provisions in the House and Senate versions of the National Defense Authorization Act for Fiscal Year 2019. These provisions are designed to help maintain our technical advantage in emerging technologies and better harness their power to protect our national security, with a strong focus on artificial intelligence and machine learning. At the time of publication, these provisions had not been reconciled in the conference version of the bill. PSC will continue to track this issue and will report on the provisions of the final bill in a future issue of this magazine.

### House

- Requires the Secretary of Defense to develop and implement a "National Security Science and Technology Strategy" to prioritize the Department's science and technology efforts and investments.
- Establishes an "Artificial Intelligence and Machine Learning Policy and Oversight Council" at the Department of Defense to develop and continuously improve research, innovation, and policy around artificial intelligence and machine learning.
- Establishes a "National Security Commission on Artificial Intelligence," an independent 15 member Commission to review advances in artificial intelligence and its impact on US competitiveness, our technical advantage, and workforce.
- Requires the Secretary of Defense to conduct a study to determine how to attract students with educational backgrounds in science, technology, engineering, and mathematics—including the fields of artificial intelligence, machine learning, and cybersecurity—into the Department's workforce.

### Senate

- Requires the designation of a senior official with principal responsibility for the coordination of activities relating to the development and demonstration of artificial intelligence and machine learning, and tasked the designee with providing a detailed strategic plan to develop, mature, adopt, and transition artificial intelligence technologies into operational use.
- Directs the Director of the Defense Intelligence Agency to compile a report that directly compares the capabilities of the United States in emerging technology areas and the capabilities of adversaries of the United States.
- Allows the Air Force to spend up to \$42.8 million for nontraditional technologies to increase the availability of aircraft and decrease backlogs for the production of spare parts for such aircraft.
- Grants the Under Secretary of Defense for Research and Engineering one-year authority to direct the military departments and other elements of the Department on four priority emerging technologies: hypersonics, directed energy, space satellite architectures, and artificial intelligence.



AI, not just as another set of programs, but also as a powerful enabler for nearly every defense mission and function.

Strategic competitors<sup>3</sup> are not standing idly by as they reshape their economies to increasingly service-based industries bolstered by technology. The U.S. commercial sector also is driven to pursue faster AI development, in the face of growing international competition.

Federal civilian agencies need a similar sense of urgency when it comes to leveraging AI and machine learning to improve performance in their missions and functions. White House driven initiatives will spur efforts to bring more innovation like AI into agencies across the federal government. Fortunately, work has been underway for some time.

Both last year's "Report to the President on IT Modernization"<sup>4</sup> and this spring's President's Management Agenda emphasize leveraging IT and data for better service delivery. One example is the Agriculture Department, an early test bed for new federal IT modernization Centers of Excellence. In addition, the first projects have been approved under the Technology Modernization Fund, a bold initiative to modernize legacy systems and reap savings as well as better performance.

Upgrading aging IT systems across the federal government is a crucial step, but it's only the beginning. As agencies continue to put in place increasingly modern IT architectures and systems, such as cloud computing infrastructure, they can better leverage new innovations to improve performance and deliver better services to citizens.

## The Role of the Private Sector

How should the government advance AI for its purposes? To what extent do federal agencies develop their own, and how much should they draw from the commercial private sector? That depends on the extent to which commercial offerings directly meet the requirements of the customer.

Commercial private sector R&D has led to amazing technology development and advances in AI. Today, the U.S. government's investment in research and development is less than 5 percent of the global total. For AI and other emerging technologies, government agencies can leverage and build on capabilities already developed in the private sector. Commercial companies develop unique capabilities that cannot be affordably matched by the government, but those commercial AI applications don't always translate directly to their desired applications - especially in areas of national security. In such cases, more federal engagement is required.

Today's contractors have a demonstrated track record that indicates they can play key roles in matching existing and emerging AI capability to the customer requirements, tailoring it where necessary. They have done this with new technology, systems, and processes for decades. This approach will help the government capture the benefit of commercial research and development (R&D) while still being able to meet unique government needs.

Our military and civilian agencies need rapid access to innovation from government, contractor, and commercial sources. Regardless of who develops AI, or for what uses, what matters is improving government operations and staying ahead of our competitors.

Contractors play essential roles in developing and delivering those capabilities to government agencies across the board.

## Bottom-Up Actions

Applications of AI and machine learning have been underway across government for several years. The Department of Veterans Affairs uses AI to improve predictions of medical complications and treatment for combat wounds at Walter Reed Medical Center. The Department of Homeland Security has AI tools for detecting cyber network intrusions and malicious activities. The Defense Advanced Research Projects Agency developed a Digital Tutor for computer skills learning that led to unprecedented performance by Navy students in training assessments. The Bureau of Labor Statistics is using AI to help analyze data for workplace injuries faster<sup>5</sup>, completing in one day what a human alone took one month to do. AI tools are becoming increasingly important for agencies to deliver citizen services and a high-performance government.

Looking forward, the 2018 President's Management Agenda calls for using automation software to improve efficiency of government services. Machine learning and AI tools hold great promise, from combatting improper payments to deploying agency assets effectively in response to natural disasters. However, the 2016 National Science and Technology Council report on AI noted<sup>6</sup> that there is wide variance in agency capacity to foster and harness innovation. Many agencies lack the key attributes of significant R&D budgets, a workforce with many scientists and engineers, and ongoing collaborations with private-sector innovators.

## The Importance of Leadership

Strong leadership and innovative use of available contractor support will be needed to bring innovation from America's technology sector into our government. The White House, perhaps drawing from work by the recently-created Select Committee on Artificial Intelligence, can accelerate AI in government by issuing a strategic vision and then providing implementation-level guidance. Improved data sharing will help connect top-down guidance to bottom-up needs and programs.

Continued White House leadership and engagement with industry and academia will also be required for federal policy updates, including AI technical and governance standards that will need to evolve rapidly to ensure federal adoption of AI technologies.

In addition, while AI technologies may augment or displace some types of work performed by federal employees, AI tools will enhance—rather than replace—the role of many workers.

The ability to leverage emerging technologies such as AI—with the critical help of the private sector—will help agencies protect national security, redesign business processes, and improve service delivery to the American people. PSC looks forward to working with our government partners every step of the way. ■

<sup>3</sup> <http://www.wired.co.uk/article/why-china-will-win-the-global-battle-for-ai-dominance>

<sup>4</sup> <https://itmodernization.cio.gov/assets/report/Report%20to%20the%20President%20on%20IT%20Modernization.pdf>

<sup>5</sup> <http://www.businessofgovernment.org/node/2661>

<sup>6</sup> <https://bit.ly/2j3XA4k>