

Deploying AI for Strategic Impact

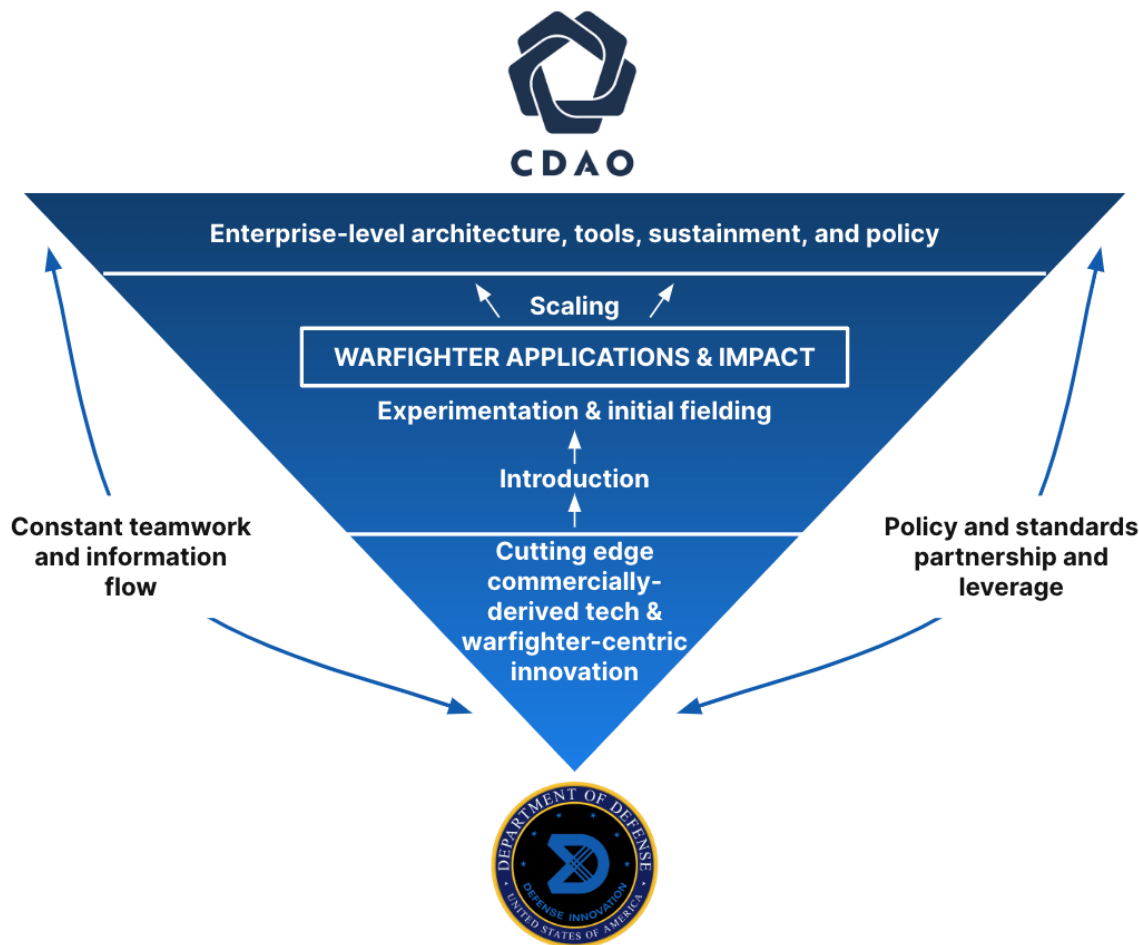
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Deploying AI with speed—and responsibly using it to deliver concrete, practical effect that achieves strategic impact—is already a centrally critical imperative for the Department of Defense (DoD). This will only become more true over time, as AI, whether the most exquisite large language models or the more basic machine learning tools, intersects with virtually every critical function across the innovation ecosystem, and potentially impacts virtually every category of warfighter challenges at the tactical, operational, and strategic level. As a result, the United States’ ability to deter future conflict—or win if forced to fight—depends on DoD’s ability to rapidly inject transformational new capabilities not only into our systems, but into the way we train, signal, and fight. The use of AI to tackle a wide variety of tasks at unprecedented speed, unprecedented scale, and with unparalleled levels of performance means that our teams must leverage it to get the most out of every dollar the Department spends and create overmatch on the battlefield. Doing this well will literally save lives, both by *avoiding* war through credible deterrence, and swiftly *winning* wars that we cannot avoid.

DoD simply cannot achieve this without close partnership with the commercial companies whose efforts are at the absolute cutting edge of the related technologies. Commercial companies are reshaping a dizzyingly broad range of arenas of human endeavor, spurred on by the relentless demand for change from billions of consumers around the world and the enterprises that serve them. As a result, while AI has deep roots in the historical collaboration between the public sector, private sector, and academia, the commercial tech sector continues to lead the deployment of the data, software, and compute that underlie modern AI systems. The current crop of capabilities based on large foundation models that industry has already invested in is a primary example of an area in which DoD must not only leverage rapid advancement of technology driven by industry, but learn from the processes by which the private sector makes use of that technology, and by the applications that a constantly evolving private ecosystem deploys to convert that into impact.

The [Defense Innovation Unit](#) and the [Chief Digital and Artificial Intelligence Office \(CDAO\)](#), representing the Department’s two newest “Principal Staff Assistants” to the Secretary of Defense, responsible for driving a functional area for the Department as a whole, are partnered at the hip to ensure the DoD is able to take full advantage of all that innovation, and to deploy it in a way that meets the special responsibility for responsible speed and scale required by the demands of national security and potential power of its applications of technology. CDAO leads the Department’s efforts to deliver enterprise-level architecture, tools, sustainment, and policy for AI, data, and digital capabilities. DIU is the Department’s lead for bringing commercial technologies across AI, autonomy, cyber, energy, human systems, space, and emerging areas like quantum, into the Department to address warfighters’ needs with the focus, speed, and scale required for strategic effect. DIU leverages a unique cadre of “dual fluency” talent and deep partnership with the warfighter to help bring the capabilities of commercial and nontraditional vendors to bear on the most critical needs those warfighters have, leveraging decades of private-sector innovation with best-of-breed solutions and the billions—sometimes trillions—of dollars of private capital that have helped make them a reality. CDAO ensures that these capabilities—whether in AI specifically or in the many areas that rely on AI—can scale their use of data and AI-enabled processes and tools to the rest of the Department via CDAO-managed infrastructure. CDAO also ensures that the policies, standards, and guidelines are established, executable, and transparent so the Department can achieve this with speed, responsibility, and cost-effective scale across the entire enterprise. Both then work closely, frequently together, with the

Services—the Department’s true “engines of scale”—and with others across the Department ranging from the Combatant Commands to the Joint Staff and others in the Office of the Secretary of Defense to agencies in areas as diverse as health, logistics, and intelligence to ensure these technologies deliver. Together, our mission is to ensure that our Soldiers, Sailors, Airmen, Marines, and Guardians not only have the best AI at their fingertips, but are trained to employ it to maximum effect—and that these capabilities are then integrated into the way we fight. The below graphic gives a visual for how this works.



At CDAO, we are further laser-focused on establishing a solid foundation upon which the Department can build AI-driven capabilities. To start, this means making sure DoD’s data is available, accessible, and shareable; ensuring that the Department has access to the necessary computational resources both to train AI models on this data and deploy them to a heterogeneous set of systems; and leveraging the best of both open source and commercial software so that AI developers working on behalf of DoD can move as quickly as possible while maintaining close alignment with the Department’s risk management principles.

The work that DIU and CDAO have done to deploy Machine Learning Operations (MLOps) over the last several years alongside the mine countermeasure community is a good example, and a microcosm of how we can and should work together to enable private industry to solve DoD problems. In this particular case, the Navy found that a set of mine-hunting unmanned underwater vehicles (UUVs) were experiencing false positives in their computer vision system when moved from one locale to another. This is a familiar problem for AI developers—distribution shift often causes a new error mode. Whereas in industry, developers would quickly

update the training set, retrain a model, retest it, put it through continuous integration and deployment, and push out an update, in the DoD's federated information security environment, that process required physically flying hard drives around and took six months, which is far, far too slow. To resolve this, DIU, CDAO, the Navy, and other parts of the Pentagon coordinated to run a competitive program via a [DIU Commercial Solutions Opening \(CSO\)](#) to pull in MLOps tools that are already used in industry to build and deploy models at scale. DIU and the Navy recently deployed these tools within a DoD exercise, helping reduce the time to update models from six months down to just a few days. Now that this concept has been proven for UUVs, these capabilities are in the process of being deployed to a broad range of environments and platforms throughout the DoD—in a way that leverages CDAO's enterprise-wide infrastructure, standards, and processes.

This is just one small example of something that can and must happen on a rapid drumbeat and massive scale, and on increasingly central warfighting functions. The partnership between DIU and CDAO, and the partnership of the two together with the rest of the Department, is therefore a strategically critical imperative for national security. Our organizations are constant, close partners in ensuring that DoD invests in modern infrastructure to scale best-of-breed data and AI capabilities. CDAO is heavily focused on providing the core infrastructure upon which the Services and warfighters will execute a number of data-driven applications, while DIU runs milestone-driven prototypes to address specific needs with the intent that companies leverage data, compute, and software provided via CDAO. Our organizations work together to improve the Department's AI infrastructure via the feedback loop among Service users, commercial vendors, and infrastructure owners. In each of these cases, DIU and CDAO coordinate closely to make best use of mechanisms like the DIU CSO process and the [GIDE industry day](#) to jointly communicate a clear demand signal from DoD to industry, and to scale successfully prototyped capabilities to the joint force via mechanisms like CDAO's [Tradewinds marketplace](#) as well as existing Service acquisition mechanisms.

Our organizations are also working together to move with responsible speed to integrate the latest innovations in AI. As an example, while we continue to make progress on procuring basic compute and labeled data assets necessary to broadly support supervised machine learning, we're also thinking about how to pull in foundational models to reduce labeling requirements, leverage self-supervision on DoD-specific data modalities, and utilize purpose-built compute hardware to reduce power requirements. To make sure that we are doing this in a way that aligns with U.S. values, DIU and CDAO have worked closely together on the [CDAO's Responsible AI \(RAI\) Toolkit](#). In fact, the [DIU RAI Guidelines](#) developed over the last several years with multiple commercial partners are a core component of it. We've witnessed firsthand that not only have companies benefited from using these guidelines within DoD, but they have actually experienced more success in their private sector endeavors by passing DoD's rigor for deployed applications. The transparency and concrete application of standards enables onboarding of commercial technology in a way that can rapidly scale.

As we work to make progress on all of the above, we are also cognizant of how difficult the next major step in DoD's AI journey will be: practicing how we play. To trust AI-driven capabilities in a real-world situation and convince ourselves that they enable us to operate at a favorable place on the risk-reward curve, we need to be practicing with them every single day from the command level down to the tip of the spear. We need to be characterizing failures, iterating on CONOPs, and helping the Services train our people.

As we build the muscles to use AI in warfighting applications, we are also aware that aiming to emulate the processes and mindset that made the scalable computing paradigms will also require the private sector to be heavily involved in our DoD efforts. One example is the fact that many of the best companies in software and AI are maniacally focused on programmatic interfaces to data and software services—or application programming interface (APIs). DoD is not an API-driven organization, which is a result of decades of history and acquisition structures

that were not designed for a software and data-centric world. We are changing that. When DIU and CDAO acquire or ingest a technology, we expect both our commercial vendors and government partners to provide open APIs (see the [SeaVision Maritime Domain Awareness program's public API](#) for an example of what right looks like from the Government side). We expect vendors to deliver AI models with evaluation datasets for regression tests. We expect that our vendors will not make us spend precious time and effort prying taxpayer-funded data from their platform. We will prioritize vendors and DoD mission partners that align with these principles, because this is the only way that DoD and industry can create the type of environment needed for success.

Indeed, these are some of the core ideas behind a new CDAO construct, [Open DAGIR](#), which stands for Open Data and Applications Government-owned Interoperable Repositories. Blending enterprise-level infrastructure to ensure reliable, enduring access to the government-owned, contractor-operated data stacks with enterprise licenses to facilitate access to mature applications that can be deployed at scale with agile requirements and acquisition processes — in many cases utilizing DIU to rapidly access the very best tech—will accelerate procurement of digital capabilities prototypes. This effort will provide the infrastructure that aligns with these ideas to enable DoD and industry developers to build AI applications with the speed, scale, and agility of relevance.

These concepts are also at the core of another new structure, the AI Rapid Capabilities Cell (AIRCC), which CDAO and DIU are working together to stand up. The AIRCC will focus on the development and deployment of advanced and frontier AI capabilities to help accelerate the execution of cutting-edge technology by conducting rapid material development and delivery to address immediate, near-term, and mid-term needs focused on intra-agency and defense-wide requirements. It will also stimulate aggressive, proactive AI capability development and utilize public-private partnerships to identify where AI frontier technological opportunities could be leveraged to deliver warfighting capability to our operating forces, as well as enterprise management capability to support performance improvement objectives. The AIRCC will be housed within CDAO, staffed with leadership from DIU, and governed by a board chaired by the CDAO and DIU Director. Setting it up this way will ensure that this team is able to get the very best of both organizations' capabilities and move fast with the best AI technology that is centered on concrete warfighter needs, and then move fast again to scale rapidly at the enterprise-wide level while reflecting the principles for responsible, cost-effective AI leadership.

Adopting and responsibly accelerating AI use in the DoD is an imperative to deter major conflict—or win if forced to fight—in the twenty-first century. While the work required to develop and deploy AI capabilities can be intimidating, our adversaries around the world are not resting, and we must build and maintain a robust leadership in responsible AI deployment in order to remain the bulwark of the free and open international order. On this front, we need all of the companies reading this to pitch in—your technology, your thoughtfulness, your moral compass, and your commitment to building a better America—to help us win the future with AI. At DIU and CDAO, we look forward to being your teammates and supporters, and to working with you to shape, build, and secure the future, every step of the way.

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