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An Innovation Strategy for the Decisive Decade

National Defense Science & Technology Strategy Review Task Force

July 17, 2023

The Defense Innovation Board was tasked to assess the National Defense Science and Technology (S&T) Strategy in meeting Congressional requirements and National Defense Strategy priorities. The Task Force conducted this effort in the larger context of geopolitical and technological developments. The Task Force engaged military and civilian leaders within the Office of the Secretary of Defense, Joint Staff, Services, and Combatant Commands; industry – both traditional and non-traditional companies and start-ups, as well as industry and trade associations; and academic research institutions of various sizes and histories working on critical S&T for our nation.

The Task Force arrived unanimously at one overriding conclusion: **the Pentagon is not moving at the speed necessary to meet the national security needs of the United States.**

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Overview

Our nation is awash in innovation, and we believe that the Department of Defense's (DoD) challenges are not primarily about technology but instead center around culture and process. It takes far too long to transition technology to the warfighter, and DoD's process-focused, risk-averse culture creates enough obstacles to make it nearly impossible for non-traditional defense companies to contribute to the DoD mission. Many studies have made recommendations to address DoD's innovation adoption and scaling problem, but the solution boils down to changing a culture that favors caution and existing processes into a culture of innovation that embraces experimentation, agility, learning, and risk. We must create a defense innovation ecosystem that brings innovators closer to the warfighter and can rapidly adopt and scale innovative solutions. While established military research labs and traditional defense primes have an integral role to play, they cannot be the de facto arbiters and gatekeepers of innovation. The 20th century defense innovation ecosystem will not win a 21st century conflict. It is imperative for the Department to engage a wider, more diverse network of innovators, drawing on the strengths and ingenuity of our whole nation, as well as those of key partners and allies, to meet the national security challenges of this century. Having a National Defense S&T Strategy (NDSTS), the first-ever for DoD, is important and can reinforce key tenets of the National Defense Strategy, but it only matters if the Department actually delivers technological advantage to the warfighter. We believe doing so requires a sense of urgency, strict accountability for outcomes, and inspiring talent to contribute to the mission.

The innovations needed to deliver decisive advantage are not found solely within the traditional defense industrial enterprise, and decisive advantage will not be gained using traditional approaches. We are obligated to equip our service men and women with the best and most cutting-edge capabilities the nation can produce; leaving them vulnerable with anything

less is morally indefensible. With potential adversaries threatening to surpass the United States in certain technologies, we run the risk of falling behind.

“Our military’s excellence isn’t a birthright ... we can’t take it for granted in the 21st century ... that’s what this is all about: innovating to stay the best.” – The Hon. Ash Carter, Former Secretary of Defense

An innovation strategy fit for this decisive decade needs to provide a clear roadmap to institute a new, more rapid, agile, and innovative culture with incentives aligned across the defense and private sector enterprises to harness the best our nation can provide for our warfighters. While we commend the Department –

and Congress for the first-ever NDSTS, we are not convinced this strategy will achieve that objective.

Assessment

In the course of our research and examination of the NDSTS, we arrived at some initial observations:

- The NDSTS outlines worthy and important lines of effort and guiding principles and acknowledges the need to “*incentivize ... systems that can rapidly incorporate cutting-edge technologies*” and “*reward rapid experimentation, acquisition, and fielding*”, but the question remains whether and how it can and will achieve those aims.
- The NDSTS did not acknowledge challenges and obstacles in the system, with only a single mention of the need to “*overhaul ... business management practices*”; it does not effectively address trade-offs and how to gain speed in the system (e.g., process or culture change).
- The NDSTS does not give confidence that the Department will change how it does business, and thus fails to make a strong business case for companies or investors to focus on defense challenges.

What Is Required

The DIB is one of many organizations working to remove obstacles to innovation in the Department. Several others have produced insightful recommendations, and we have not attempted to duplicate or reiterate their work. We believe, however, that any successful S&T strategy must focus on three essential elements.

1. Urgency: The Department must act with the sense of urgency that the situation demands. Currently, it does not.

Dramatic changes are taking place in the strategic environment; technologies are accelerating at a breathtaking pace; and the Department faces a greater range of challenges across more domains than ever before. The NDSTS does little to mitigate concerns that DoD is unfocused, lethargic, and even, one industry respondent described, “disconnected from reality.”

DoD has demonstrated an ability to move fast in times of crisis – with Operation Warp Speed following Covid-19 and with the Joint Improvised Explosive Device Defeat Organization (JIEDDO) during the Iraq War, for example. But now DoD must figure out how to act with a

wartime sense of urgency without suffering the brutal costs of war. Failure to do so may well result in the United States losing the next global conflict without a shot being fired.

The task force believes the primary obstacles to developing, adopting, and using technology faster are largely cultural and the result of misaligned incentives. DoD elements across the spectrum from Acquisition & Sustainment to Research & Engineering, to the Services, Labs, and Joint Staff are more focused on professionalizing process than delivering results, and on increasing budgets or staff without increasing output. Furthermore, they are risk-averse to new ideas or approaches either out of unfamiliarity or fear – neither of which breed a culture poised to win in a complex, dynamic, and ever-changing environment. We know of no way to overcome those obstacles other than through strong, consistent leader engagement, pushing every part of the system, and resetting incentives linked to outcomes. In DoD, this will require the personal investment and involvement of the Secretary and the Deputy Secretary. No one else has both the responsibility and the authority to break down barriers, override bureaucratic inertia, and force action. DoD culture is also influenced by Congress, and the top leadership there, including the relevant committee chairs and ranking members, must be personally involved too.

“You can’t build the military of the future in a culture of fear.” – Lt. Gen. (Ret.) S. Clinton Hinote

One of the wisest comments we heard over the last seven months was that the culture of obstruction will not change until it is explicitly called out. We call it out now, not with blame but with candor. A culture of obstruction impedes support for the warfighter; a culture of obstruction hinders our ability to defend the nation; a culture of obstruction disrupts our ability to work with allies and partners. The culture of obstruction must change. And that change will require the personal, consistent, strong involvement of the two top leaders in the Pentagon and those in Congress. Leadership from the President would add even more; the two branches of government must act, and act together.

A key issue affecting urgency and speed is funding. We cannot move at required speed with the current budget and funding process. While awaiting the recommendations of the Planning, Programming, Budgeting, and Execution (PPBE) Reform Commission, Congress should grant DoD greater flexibility in funding, whether through limited portfolio funding or another mechanism. A Defense Innovation Unit (DIU)-led “hedge portfolio” introduced in the House Defense Appropriations Subcommittee Committee’s Fiscal Year 2024 appropriations bill offers a promising start.¹

Additional changes that streamline pathways to work with DoD and collaborate across the defense industrial base are needed as well. The approaches of the Rapid Defense Experimentation Reserve (RDER) and Accelerate the Procurement and Fielding of Innovative Technologies (APFIT) pilot have potential, so long as they can maintain a culture of experimentation and agility. Allowing certain companies to obtain facility security clearances faster, making it easier to shift research funds among programs and technologies, would help further lower barriers to speed. Increasing the number of DoD acquisitions professionals trained in DIU’s contracting authorities is also crucial. And, updates to the International Traffic in Arms

¹ <https://docs.house.gov/meetings/AP/AP00/20230622/116151/HMKP-118-AP00-20230622-SD002.pdf>

Regulations (ITAR) are essential to support the American warfighter as well as allies and partners who depend on U.S. weapons and equipment.

While we have seen some progress in innovative pockets and organizations across DoD, no one should be under the illusion that a handful of scattered offices, programs, and initiatives will enable us to meet our most challenging national security problems. Only a fundamental cultural change that evinces a wartime sense of urgency will suffice. And while moving faster inevitably increases the risk that mistakes will be made, the right incentives, rewards, and culture change will allow DoD to become attuned to the benefits of failing, learning, and trying again, while being judged on results.

2. Accountability: Change in DoD requires accountability with clear, specific, concrete metrics that are tied to resources and applied across the Department.

To reiterate, only the Secretary and Deputy Secretary have both the authority and the visibility across the Department to make change happen. We acknowledge these two leaders have incredible demands on their time and attention. But if getting innovative tools into the hands of the warfighter is a top priority, there is no substitute for the persistent, personal involvement of these two officials.

The Service Secretaries and Chiefs need to be empowered to make difficult budgetary and procurement choices, such as canceling programs of lower value to fund initiatives with greater potential but that may not garner an immediate return on investment. Air Force Secretary Frank Kendall's seven operational imperatives for defining future air power offer a glimpse of how Service leadership can focus and encourage a force to innovate and drive accountability.²

"On any matter that requires urgency, it doesn't happen unless the Secretary or the Deputy Secretary grabs it." – The Hon. Robert Gates, Former Secretary of Defense

Budget decisions should reward progress with additional funding and punish obstruction with program cuts. Performance should be rigorously evaluated using a scorecard to track efforts to close capability gaps that result in tangible outcomes. Rather than creating a new system with added bureaucracy, these metrics could model and/or utilize existing reporting requirements and standards nested within the Defense Readiness Reporting System (DRRS). Leaders must be willing to root out program executive offices that are risk avoidant and overly focused on process and, simultaneously, promote those who take risks and focus on results.

Changes that the NDSTS went through in its coordination process reinforce the futility of relying on coordination by committee or steering groups to deliver meaningful change. Most often, they are a mechanism for parochial interest protection and delay and result in the dilution or deferral of hard trade-offs. In order to instill greater accountability and opportunity for collaboration with the innovation base, any NDSTS implementation plan should be unclassified to the extent possible. Industry, research institutions, investors, media, and the public should be

² https://www.af.mil/Portals/1/documents/2023SAF/OPERATIONAL_IMPARITIVES_INFOGRAPHIC.pdf

able to know what is expected and how performance, outcome, and accountability will be assessed.

3. Talent: DoD is in a race for talent and must attract the best and brightest from across the nation – and the world – to work in national security.

Leaders in DoD, the White House, and Congress must strongly and consistently articulate the essential mission of national security. That message must be heard by those we seek to recruit and retain in government service. This year marks the 50th anniversary of the All-Volunteer Force and offers an important inflection point for us to think about the call to national security and public service. This call to serve must be heard not only by those willing to serve in government, but also by those in industry, academia, finance, science, and technology who have vital contributions to make. The Department must also consider new models to work in and with government that reflect changing workforce norms and variability in time and service. Even the best designed strategy needs to be founded on and executed by capable and motivated individuals in order to succeed.

The enduring advantage of American innovation is people and the diversity of educational and professional pathways that empower the individual. Today, we make it too hard to work in government and too hard to work with the government. Providing rotational or exchange opportunities for individuals to acquire expertise in other areas and offices within government or across and between government, industry, and academia strengthens the defense innovation ecosystem as a whole, and will enhance the experience, skills, and entrepreneurship of those who find government service a life-long calling. Technical-minded service members should be empowered to gain cross-cutting experience in the private or research sectors, and vice versa: researchers in academia or industry should have the ability to pursue meaningful careers in national security. Working for DoD as a technologist should be regarded not as a temporary job, but as a lifelong, enriching vocation.

Diversifying DoD's public outreach and establishing a resilient business case for working with the Department will be critical to tap into talent and expand the pool of companies, universities, research laboratories, independent technologists, and others that regard defense innovation as an urgent mission to take upon themselves. And, of course, that talent pool must include individuals, companies, and organizations within allied and partner nations.

Appropriate security is, of course, essential. At the same time, too much is classified; our security systems are cumbersome and outdated; and this drives capable talent away from working in national security. Our dysfunctional immigration system is also an enormous obstacle to attracting and retaining needed talent. Offering new, expedited immigration pathways for those willing to contribute to the national security enterprise would make a significant, positive difference.

Conclusion

The stakes are high and the consequences grave. The daily lives of all Americans will be affected. Success or failure of America's national security objectives – be it defending the

homeland, protecting our freedoms, or supporting values we cherish – depend on providing our armed forces with the tools they need to do the job we ask of them and doing so at necessary speed. DoD’s lack of urgency and failure to act at appropriate speed, both hindered and driven by misaligned incentives, are the most significant barriers facing our efforts to prepare for, and hopefully prevent, the next war. The freedom and quality of life that generations of Americans have enjoyed and benefited from is in jeopardy. And the problems rest not in our technology or our capabilities or even with what our adversaries are doing, but in our own culture and processes – things well within our power to fix.

Only leadership – the personal involvement and persistent attention of the Secretary and Deputy Secretary of Defense, and of leaders in Congress – can ensure that we are able to provide the security that our nation requires. **We call on them to do so.**

Recommendations

1. Urgency
 - a. Instill wartime urgency into Department culture; build the system and process to deliver for the Department’s key customer – the warfighter.
 - b. Work closely with leaders in Congress and the White House to drive necessary changes to ensure technological advantage.
 - c. Continue to lower barriers to innovation and create pathways to make it easier to collaborate across the defense innovation ecosystem.
2. Accountability
 - a. Secretary and Deputy Secretary maintain persistent and personal involvement to drive outcomes and re-align incentives.
 - b. Prioritize outcomes over process, and tie resources to clear, specific, concrete metrics.
 - c. Develop an unclassified implementation plan for the National Defense S&T Strategy.
3. Talent
 - a. Issue a call to innovators to serve the national security mission, working with leaders in the White House and Congress to inspire service.
 - b. Develop a talent strategy that provides accessible opportunities for diverse, motivated, and capable workforce that reflects the realities of modern work.
4. Task two follow-on studies – to either DoD officials or the DIB – to:
 - a. Identify ways to lower barriers to innovation to make it easier to work with DoD, and
 - b. Map internal DoD and external stakeholder incentives and recommend changes to instill the needed culture of innovation.

Appendix A Study Participants and Contributors

The Task Force would like to thank the nearly 60 different stakeholders that contributed their insights to the study, including – industry and trade associations, start-ups and small businesses, venture capital and private equity investors, established defense industry and prime contractors, University-Affiliated Research Centers, Historically Black Colleges and Universities and Minority Serving Institutions, Federally-Funded Research and Development Centers, as well numerous senior defense officials. Their candid insights and perspectives were invaluable to the Task Force in identifying ways the Department can build enduring advantages, leverage the strengths of our innovation ecosystem, and the tap into the ingenuity of our Nation’s innovators who work tirelessly to secure American interests.