A Hedge Strategy to Strengthen Defense Capabilities

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Introduction

The United States must use all levers of civilian, military, economic, technological, and diplomatic power to ensure the stability and security of the liberal rules-based international order in the 21st Century. This idea of applying all these dimensions simultaneously is called "integrated deterrence" and can be most effectively implemented if the DoD is supported by interagency partners and allies.[1] Given the more centralized societal control of China as our pacing adversary, the People's Liberation Army (PLA) is already leveraging multiple levers of power through the Chinese Communist Party's strategy of technological preeminence enabling faster economic growth. In fact, its strategy for combining civilian, military and technological power is "civil-military fusion" aiming to provide every civilian innovation to the PLA, including all relevant commercial companies with dual-use technology as suppliers to a broader defense base.

In the United States, we do not coordinate civilian, military, and technology power in the same manner except in times of all-out war, as we saw in World War II. However, through organizations such as the Defense Innovation Unit and the Office of Naval Research, we are in fact, well connected to the world's most innovative, vibrant private industry ecosystem. Our challenges today lie not in connections, but in processes and re-imagining the future of defense itself. Our post-Cold War defense strategy has relied more on traditional platforms such as planes, tanks, and aircraft complemented by counterterrorism capabilities. These traditional platforms take decades to develop and build, providing stable targets for adversaries to understand, copy and develop strategies against.

In the context of a technology environment that is changing more rapidly and more diffusely than at any point in recent history, the United States must explicitly address the fact that such rapid, distributed technological change presents an increasing opportunity for asymmetric advantage or strategic surprise that could be gravely harmful to U.S. interests. By contrast, mastering this new technology environment will prove critical to success. DoD is already encouraging the creation of new concepts enabled by emerging technologies: shortening the acquisition cycle to enable increased iteration and developing special capabilities in classified programs - but we are not focusing these efforts systematically as a Hedge Strategy, which we argue must be a part of the U.S. vision, concept of operations, and acquisition logistics moving forward.

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[1] Naomi Cooper, "Pentagon's 2022 National Defense Strategy to Focus on Integrated Deterrence," *ExecutiveGov*, December 13, 2021, https://executivegov.com/2021/12/pentagons-2022-national-defense-strategy-to-focus-on-integrated-deterrence.

This Hedge Strategy encompasses several ideas:

- First, maintaining and enhancing relationships across the private sector to leverage emerging technologies to field alternative concepts and capabilities at scale to both complement and provide a hedge to our existing, exquisite (meaning costly, dominant, massive, and few) weapons system platforms. The Hedge addresses the inevitable vulnerabilities to these exquisite platforms from new, often inexpensive emerging capabilities such AI-powered anti-ballistic missiles.

- Second, applying existing commercial solutions with a sense of urgency and premium on speed enables fielding these capabilities at scale within the next three years (not decades). Moving rapidly provides additional deterrence and an element of unpredictability for adversaries who focus on U.S. platforms and how we have used them for years.

- Third, Hedge Strategy architecture should encompass the elements of small and low cost, unmanned, many and smarter, or SUMS:
  - **Small and low-cost** ensures we can field many resilient, attritable systems with diverse capabilities at an affordable cost that can overwhelm and confuse our adversaries
  - **Unmanned** extends the operational reach and efficacy of warfighters, which also mitigates the needs for larger manned forces and potentially saves lives
  - **Many** because quantity will be an important deterrent and provide an asymmetric advantage relative to exquisite platforms, especially in survivability
  - **Smarter** because software is the key to enhanced functionality of all hardware, and because AI/ML and cyber can provide new capabilities as teams of smaller systems are combined. Additionally, software capabilities can be updated in real time.
  - These capabilities can be combined in new ways evolving over time more agilely than large platforms which remain in use and largely unchanged for decades. Agility today means platforms that can be agile in function, of course, but also agile in mission adjustment and software upgrades on short timelines.

A potential conflict with China (or for that matter, Russia, North Korea or Iran) will be different than conflict as we have known it in the past. Space, cyber, electronic warfare, financial technologies and misinformation will play larger roles than ever before in creating confusion and destroying aspects of our civilian, government and military infrastructure.[2] Further, we are already in conflict with adversaries today in cyber and misinformation operations. The hedge strategy must encompass both gray zone conflict as well as the entire spectrum of conflict to field concepts that are non-kinetic and that have an impact before kinetic conflict begins. Russia, in particular, is an adversary already skilled in applying a form of hedge strategy using its cyber and misinformation expertise to disable and confuse adversaries to make false flag operations more successful.

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[2] When deployed asymmetrically against civilian populations, they will create and exacerbate internal dissension within society and reduce the will of a democratic society to unite behind a national cause as was the case in WWII, the Cold War and the first Gulf War. Beyond deployment in battle where they exact a disruptive toll on conventional weapons systems, we already see aggressive Russian efforts when we're not at war to disrupt our society and damage faith in our institutions including democracy itself.

How is the United States positioned to address these emerging threats? Unsurprisingly, not very well. The U.S. defense procurement system was designed 60 years ago at the height of the Cold War when the U.S. was the unquestioned technology leader globally and the military was a key developer of new technologies. The current system of setting requirements, acquisition and budgeting was more appropriate to a time when the U.S. was the dominant military superpower and technology leader than to the present when commercial technology is both software-led and far outpacing what the U.S. military procures in both investment and the speed of product cycles. Over the past half century, some budget authorities have evolved to resist change and optimize for procuring more of "what we have" instead of developing "what we need" for the next conflict. Buying what we have is what the Pentagon does well; it ensures predictable revenue streams to predictable locations across the existing industrial base.

Current incentives are aligned to continue with the status quo which, unfortunately, may be the equivalent of buying many more battleships on the eve of Pearl Harbor. Those incentives, through the defense budgeting process, in particular, will continue to commit trillions of dollars to more tanks, ships, planes and nuclear weapons at the expense of fielding alternative concepts and capabilities, or investing at the right level in new domains like space and cyber, or investing to support an industrial base in new technologies like small drones or commercial satellites. The result is a less flexible and hardware-centric capability focused on our large platforms.

Cyber is clearly one of the biggest threats from peer adversaries today and one where we are in direct conflict with Russia and China as they threaten U.S. critical infrastructure, business continuity, reliability of weapons platforms and more. Yet the estimate of total cyber spending by DoD is on the order of $10 billion per year (~1% of the current defense budget). The budgeting process does not allocate money based on today's emerging threats. To further illustrate, DoD could be spending $1 trillion in the next few decades to modernize the nuclear arsenal which is a deterrent that we will not use unless adversaries declare Armageddon. Nuclear forces are not deterring most Russian or Chinese aggression in the world today. While there's no argument about the need for nuclear modernization, there is an argument about the 25X relative spend on nuclear modernization vs. cyber. We need much more investment and capability in space, cyber, information warfare and commercial technologies that are advancing rapidly such as AI, autonomous systems, biotech, quantum sensors, advanced communications, and many more.

Making Our Efforts More Systematic

DoD is already working on concepts which embody elements of a SUMS-based Hedge Strategy, but not as a systematic strategy. The Rapid Defense Experimentation Reserve (RDER) could be viewed in this context since it funds experiments for the military services and combatant commands. However, Deputy Secretary Hicks commented in June 2021 that "we are really not quite at a point that we have an ecosystem that's institutionalized and truly strategic."[3] As further examples, work is underway to see how teams of drones can be used to complete missions such as clearing a building (going beyond personal ISR) or as wingmen to aircraft. The constellations of small satellites (using synthetic aperture radar, infrared or radio frequencies) which will proliferate in low-earth orbit are also an example of a

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[3] Sydney Freedberg, Jr., "Hicks Seeks To Unify Service Experiments with New 'Raider' Fund," *Breaking Defense,* June 21, 2021, https://breakingdefense.com/2021/06/hicks-seeks-to-unify-service-experiments-with-new-raider-fund.

SUMS-based sensor strategy. Important elements of JADC2 are an extension of this strategy since the sensors will involve many small, low-cost and unmanned platforms. However, much of what we are working on today is not yet in the mainstream of our strategies—and importantly, not programmed, budgeted, or acquired in a timely manner. We urgently need more of these funded capabilities to develop them into operational concepts for warfighters.

This foundation is so different from the exquisite platforms that make up the most impressive platforms of U.S. power projection today, best exemplified by the F-35, the Ford-class aircraft carrier and government-built-and-owned satellites which are large (and few), expensive, manned and represent a warfighting capacity not easily reconstituted if lost. Warfare in the near future will likely require a blend of exquisite capabilities with those that are agile, attritable, and easily reconstitutable. To be clear, a hedge strategy isn't an argument against exquisite platforms, but is an argument for a more balanced mix of platforms that enables more war fighting options.

Top Level Recommendations for the Hedge Strategy:

1. Create a new leadership position with an empowered, well-resourced organization under them dedicated to coordinating and advancing new capabilities into prototype and experimentation swiftly, getting product at scale into the warfighters' hands in years, vice decades. This leader would work toward minimum viable solutions which can rapidly evolve with warfighter feedback from the outset, rather than spending years in development as a result of engineering thoroughness with the impossible objective of driving risk to zero before fielding. This leader will also provide top cover to innovators, and have authority to spark new partnerships. In Naval terms, this could be an Experimentation Fleet Commander, who could be charged with building and owning a bridge over the Acquisition valley of death. All of the recommendations below could be made possible by an empowered leader in this type of position.

2. Rapidly explore new fighting concepts that would be possible with a SUMS foundation of new hardware and software technologies; RDER enables experimenting with these concepts.

3. Allocate the right budget for developing and fielding promising innovative efforts in the current or next fiscal year, not in the typical three to five years. This would include the funding needed to scale promising solutions to put capabilities in the hands of warfighters as rapidly as possible by ensuring development and budgeting occur in parallel rather than serial fashion; and include top-level support so that innovators are encouraged to think outside of the box.

4. Pursue a first-mover strategy where DoD leads in establishing new commercial markets and supporting an industrial base for dual-use technologies such as air taxis, new battery chemistries, U.S. or allied small drones, advanced communications (6G), a pandemic warning system of sequencing pathogens, new sources of energetics and hypersonic air travel. DoD can ensure the U.S. is a first-mover by investing in these markets, creating program needs and developing suppliers so that these new products can scale in the U.S. This goes well beyond the small amounts of money placed in thousands of companies through Small Business Innovation Research (SBIR) grants, which are insufficient to develop a U.S. supply base or field a new capability at scale for DoD.

5. Implement a fast follower strategy where DoD can access and field commercial technology today in the areas of AI & cyber software, commercial satellite data , small drones, electric vehicles, autonomously-controlled tactical aircraft, surface ships and undersea vehicles. A fast follower strategy implies these changes for adopting commercial technology:

   a. Replacing the Requirements Process for commercial solutions since it's not necessary to specify to commercial suppliers what to build. We can replace the requirements process with a rapid assessment process demonstrating a capability need or problem to solve.
   b. Creating organizational homes for these commercial technologies so DoD can build centers of expertise for assessing these technologies, assign an ongoing budget, better signal demand to private industry, and avoid duplication across DoD.
   c. Apply the best practices of a complementary acquisition process that maximizes competition and operates at commercial speed (and with commercial terms). These best practices would include more widespread use of Other Transaction Authorities (OTAs), Partnership Intermediary Agreements (PIAs), and the Commercial Solutions Opening (CSO) process. Crucially, this process includes warfighters in the assessment and prototyping of commercial solutions connecting end users to the design process.
   d. Ensuring a sustained budget for these commercial capabilities (rather than episodic programs) to keep current with commercial product cycles. Ideally, the Planning, Programming, Budget, Execution (PPBE) process must be reformed so that DoD leadership can shift budget dollars to the most urgent needs—procuring solutions that were not possible when the DoD budget was created two years earlier. DoD must be able to scale current commercial solutions as soon as they are successfully prototyped, else we put too much risk on our warfighters.

Conclusion

In the end, America needs to act as we have always acted when faced with a threat: We need decisive change, a revised sense of how to dominate in a new era when technology has leveled the battlespace, and an unwavering commitment to getting the job done. We are not on the wrong end of a Pearl Harbor-style attack—yet. The good news is that if we make the adjustments now—to Acquisition and Budgeting processes; to enacting a Hedge Strategy of complementary autonomous platforms supporting our existing Fleet and Force; and perhaps most important to elevating innovation to a new leadership position that can truly turn the tide—we can maintain global stability and dominance across all domains for generations to come.