Can It Work? Outside Perspectives on DOD's Replicator Program

Obstacles and Opportunities for Transformative Change

BY

Paul Scharre

Executive Vice President and Director of Studies
Center for a New American Security

I. The Opportunity of Attritable, Autonomous Systems

Chairman Gallagher, Ranking Member Khanna, thank you for the opportunity to testify today.

The Defense Department's Replicator initiative has a bold agenda: to field thousands of attritable, autonomous systems in 18 to 24 months.

This effort is not only valuable, it is necessary if the U.S. military is to reverse its decades-long death spiral of rising costs and shrinking quantities for major weapons platforms.

If the U.S. military is to deter and, if necessary, defeat the People's Republic of China in a military conflict in the western Pacific, the United States will need large numbers of low-cost attritable systems to generate the mass necessary to prevail in a conflict.

For decades, the U.S. military has seen rising per-unit costs for its ships and aircraft. These rising costs have forced tradeoffs in quantity, and the result has been a shrinking force. U.S. military assets are individually capable but are in insufficient number for the scale of a conflict against China.

We have seen in Ukraine the scale of violence and casualties that are possible in an interstate war and the possibility that such a war could drag on for months or even years. To give a sense of scale, the level of casualties that both sides have seen in Ukraine would render the U.S. Army combat ineffective in a matter of months.

The U.S. military will need a range of platforms, including expensive capital assets such as aircraft carriers and stealth bombers, but it also will need complementary low-cost uncrewed systems to bring greater mass. We have seen in Ukraine the value of such an approach.

Both Russia and Ukraine have fielded large numbers of low-cost drones, flooding the skies with sensors to find and track enemy ground targets. These drones have not replaced the role of infantry and artillery, but they have changed the dynamic on the ground. Troops must take greater efforts to conceal themselves from aerial drones, which can be used as spotters for artillery strikes. Forthcoming analysis by my CNAS colleague Dr. Stacie Pettyjohn has assessed that this persistent surveillance has hindered both sides' ability to mass forces for surprise attacks.

Moreover, the low cost of these systems enables their replenishment, even if individual systems are not survivable. According to analysis by Jack Watling and Nick Reynolds of the Royal United Services Institute, Ukraine is losing 10,000 drones a month.[1] Yet it is able to reconstitute those forces by using cheap, commercially available drones. Russia has been able to produce extremely inexpensive military drones, saturating the skies above Ukrainian forces. At around $100,000 apiece, the Russian Orlan-10 is so inexpensive that Ukrainian defenders don't bother to shoot it down, since doing so would require expending scarce medium-range surface-to-air missiles and Russia has deep reserves of drones.[2]

This is a way of fighting that the U.S. military does not have in its current force. But it is part of U.S. history. In World War II, at the height of production, Allied factories were producing over 3.5 times as many tanks and airplanes as the Axis powers.[3] Today, the war in Ukraine has strained the defense industrial base's capacity for munitions production.[4] For the United States to be ready for a conflict with China, it must be able to produce forces at greater speed and scale than it has done to-date.

II. Obstacles to Success

Replicator is a test of the Defense Department's ability to generate the types of systems it needs, in the quantity it needs them, and at the speed required to deter China. The Pentagon's bureaucracy is likely to face challenges along all three of these dimensions.

Low-cost attritable platforms and autonomous systems are both paradigm-busting concepts inside the Department of Defense. These concepts have supporters, including the Department's current leadership, but they challenge the Pentagon's traditional ways of doing business. Keeping an acquisition system low-cost – which is essential if the platforms are to be procured in sufficient quantities – will be especially challenging, since the default instinct of the DoD's acquisition system is to add requirements and increase survivability, which will raise costs and threaten the success of such an effort.

Even if DoD can be disciplined about system requirements, it will be challenged to move at the speed that is required. Many military and intelligence officials have warned about the pressing danger of Chinese military aggression against Taiwan. Even if DoD succeeds in its goal of fielding thousands of systems in 18 to 24 months, by then at best it will be 2025. The clock is ticking. Replicator is an important step, but it is one the DoD should have taken a decade ago. Speed is now essential. One of the clear lessons from the wars in Iraq and Afghanistan is that the military bureaucracy can move quickly when needed to rapidly field capabilities. DoD did so with a host of essential capabilities for the war: intelligence, surveillance, and reconnaissance aircraft; counter-improvised explosive device technologies; and mine-resistant ambush protected vehicles. Yet each case required direct intervention by the Secretary of Defense to circumvent traditional requirements and acquisition processes that were too slow and not focused on urgent needs. Similar senior-level attention by Department leaders will be required for Replicator to succeed, along with Congressional support.

The DoD has had recent successes in breaking the mold and moving quickly. The Defense Innovation Unit in particular has brought in commercial technologies in a matter of weeks and months, not years and decades. But too often these innovation success stories have been small-scale, bespoke solutions to one-off problems. To field thousands of systems, DoD will need to operate quickly at scale, something it has often struggled to do. When DoD has attempted to scale solutions, it has often run into obstacles, including outside the Department. The $10 billion JEDI cloud computing contract was mired in protests and lawsuits that wasted three and a half years and ultimately led DoD to scrap the contract. Obstacles to change exist not just inside the Department but also in the broader defense ecosystem, including contracting rules that incentivize companies to take a scorched earth approach when they don't win contracts.

III. A Catalyst for Change

Replicator is essential not just because of the capabilities it aims to field, but because of the path it is blazing through the morass of institutional red tape. Speed and scale of acquisition and new warfighting paradigms will be needed not just for autonomous systems but across the force if DoD is to transform itself rapidly to counter a rising China. If successful, Replicator can train the institutional muscle memory needed inside the defense establishment – not just in the Pentagon but in industry as well – to move quickly, experiment with new concepts, and scale production.

Is it possible? The United States mobilized for and fought the entirety of World War II in six years.[5] Today, the average time from program start to initial operational capability for major defense acquisition programs is 11 years.[6] The United States can move faster when the moment demands it. Nor are these episodes confined to our distant past. With government support, U.S. industry rapidly scaled vaccine production during COVID to produce over 100 million vaccines per month by the end of 2021.[7]

Despite repeated warnings from intelligence and military leaders, the U.S. defense establishment is not on a war footing today. Replicator is a chance to change that dynamic, and Congressional support will be essential for this vital effort to succeed.

Thank you.

Appendix A: Additional Reading

Lauren Kahn, "Scaling the Future: How Replicator Aims to Fast-Track U.S. Defense Capabilities," War on the Rocks, September 20, 2023, https://warontherocks.com/2023/09/scaling-the-future-how-replicator-aims-to-fast-track-u-s-defense-capabilities/.

Andrew Metrick, "For Replicator to Work, the Pentagon Needs to Directly Help with Production," Breaking Defense, September 7, 2023, https://breakingdefense.com/2023/09/for-replicator-to-work-the-pentagon-needs-to-directly-help-with-production/.

Paul Scharre, "Robotics on the Battlefield Part II: The Coming Swarm," (Center for a New American Security, October 2014), https://s3.us-east-1.amazonaws.com/files.cnas.org/hero/documents/CNAS_TheComingSwarm_Scharre.pdf.

Bold. Innovative. Bipartisan.

Center for a New American Security
1152 15th Street NW, Suite 950, Washington, DC 20005
T: 202.457.9400 | F: 202.457.9401 | CNAS.org | @CNASdc

Appendix B: Curriculum Vitae

Paul Scharre is the Executive Vice President and Director of Studies at CNAS. He is the award-winning author of *Four Battlegrounds: Power in the Age of Artificial Intelligence.* His first book, *Army of None: Autonomous Weapons and the Future of War*, won the 2019 Colby Award, was named one of Bill Gates' top five books of 2018, and was named by *The Economist* one of the top five books to understand modern warfare. TIME magazine named him in 2023 as one of the "100 most influential people in AI."

Scharre previously worked in the Office of the Secretary of Defense (OSD) where he played a leading role in establishing policies on unmanned and autonomous systems and emerging weapons technologies. He led the Department of Defense (DoD) working group that drafted DoD Directive 3000.09, establishing the department's policies on autonomy in weapon systems. He also led DoD efforts to establish policies on intelligence, surveillance, and reconnaissance programs and directed energy technologies. Scharre was involved in the drafting of policy guidance in the 2012 Defense Strategic Guidance, 2010 Quadrennial Defense Review, and secretary-level planning guidance.

Prior to joining OSD, Scharre served as a special operations reconnaissance team leader in the Army's 3rd Ranger Battalion and completed multiple tours to Iraq and Afghanistan. He is a graduate of the Army's Airborne, Ranger, and Sniper Schools and Honor Graduate of the 75th Ranger Regiment's Ranger Indoctrination Program.

Scharre has published articles in *The New York Times, The Wall Street Journal,* CNN*, TIME, Foreign Policy, Foreign Affairs, Politico,* and *USA Today,* and has appeared on CNN, MSNBC, Fox News, NPR, and the BBC. He has testified before the House and Senate Armed Services Committees and has presented at the United Nations, NATO, the Pentagon, the CIA, and other national security venues. He holds a PhD in war studies from King's College London and an M.A. in political economy and public policy and a B.S. in physics from Washington University in St. Louis.

Appendix C: CNAS Independence Policy

This testimony reflects the personal views of the author alone. As a research and policy institution committed to the highest standards of organizational, intellectual, and personal integrity, the Center for a New American Security (CNAS) maintains strict intellectual independence and sole editorial direction and control over its ideas, projects, publications, events, and other research activities. CNAS does not take institutional positions on policy issues and the content of CNAS publications reflects the views of their authors alone. In keeping with its mission and values, CNAS does not engage in lobbying activity and complies fully with all applicable federal, state, and local laws. CNAS will not engage in any representational activities or advocacy on behalf of any entities or interests and, to the extent that the Center accepts funding from non-U.S. sources, its activities will be limited to bona fide scholastic, academic, and research-related activities, consistent with applicable federal law. The Center publicly acknowledges on its website annually all donors who contribute.

Bold. Innovative. Bipartisan.

Center for a New American Security
1152 15th Street NW, Suite 950, Washington, DC 20005
T: 202.457.9400 | F: 202.457.9401 | CNAS.org | @CNASdc

Endnotes

1 Jack Watling and Nick Reynolds, "Meatgrinder: Russian Tactics in the Second Year of Its Invasion of Ukraine," (Royal United Services Institute for Defense and Security Studies, May 19, 2023), 18, https://static.rusi.org/403-SR-Russian-Tactics-web-final.pdf.

2 Konrad Muzyka, Konrad Skorupa, and Ireneusz Kulesza, "Rochan's Report: Ukraine Counteroffensive Initial Assessment (June-August 2023)," Rochan Consulting, September 2023, 77, https://rochan-consulting.com/wp-content/uploads/2023/09/Ukraines_counteroffensive_initial_assessment_SEP23.pdf.

3 Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000,* January 15, 1989, 353-355.

4 Stacie Pettyjohn and Hannah Dennis, "Precision and Posture: Defense Spending Trends and the FY23 Budget Request," (Center for a New American Security, November 2023), https://s3.us-east-1.amazonaws.com/files.cnas.org/documents/Budget2022_Final.pdf; Stacie Pettyjohn and Hannah Dennis, "Production is Deterrence: Investing in Precision-Guided Weapons to Meet Peer Challengers," (Center for a New American Security, June 2023), https://s3.us-east-1.amazonaws.com/files.cnas.org/documents/Budget2024_Final.pdf.

5 Thomas Morgan, "The Industrial Mobilization of World War II," *Army History,* 1994, 31-35, https://www.jstor.org/stable/26304207?typeAccessWorkflow=login.

6 U.S. Government Accountability Office, *Weapons Systems Annual Assessment: Programs Are Not Consistently Implementing Practices That Can Help Accelerate Acquisition, June 2023, 28,* https://www.gao.gov/assets/gao-23-106059.pdf.

7 Chad Bown, "The U.S. Was Quick to Produce COVID-19 Vaccines. Then it Fell Behind," (Peterson Institute for International Economics, June 21, 2022), https://www.piie.com/blogs/realtime-economic-issues-watch/us-was-quick-produce-covid-19-vaccines-then-it-fell-behind.

Bold. Innovative. Bipartisan.

Center for a New American Security
1152 15th Street NW, Suite 950, Washington, DC 20005
T: 202.457.9400 | F: 202.457.9401 | CNAS.org | @CNASdc