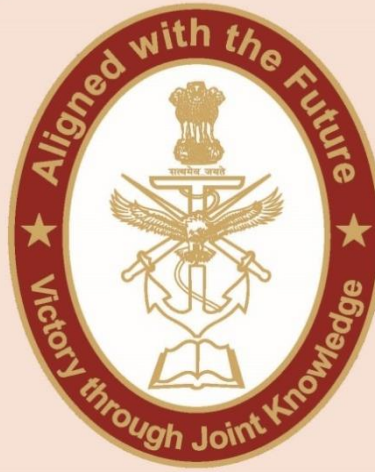


CENTRE FOR JOINT WARFARE STUDIES



CENJOWS

CAN CHINESE MILITARY WIN THE TECHNOLOGY WAR?

1. **Can China's Military Win the Technology War?** The question whether Chinese military can win the technology war against the US, often comes to the minds of many military thinkers and analysts especially in view of the demonstrable achievements of the Chinese scientists in general and military technologists in particular. China's recent progress in the field of 5G technologies, artificial intelligence and robotics, space technology and many other fields compels the world to contemplate about the shape of things to come in the field of technological competition. Anja Manuel and Kathleen Hicks in their well researched article have attempted to address this question and have suggested "How the United States should—and should not—counter Beijing's civil-military fusion"¹ in technological field.

2. Chinese President Xi Jinping formalised the concept of civil-military fusion as part of the extensive military reforms laid out in his 2016 five-year plan and established a new Central Commission for Integrated Military and Civilian Development. The commission's goal is to promote the development of dual-use technology and integrate existing civilian technologies into the arsenal of the People's Liberation Army (PLA). The authors noted four types of Chinese entities participating in civil-military fusion. One: There are traditional Chinese state-owned defense contractors and their many subsidiaries; Two: private dual-use manufacturers contributing research and development (R & D) and producing subcomponents for the main defense contractors and for the PLA directly; Three: 43 PLA-supervised universities and at least a dozen state-run think tanks conducting research that feeds directly into Chinese weapons systems; Four: six quasi-private venture capital and private equity firms that invest in cutting-edge technologies. Civil-military fusion sets off alarm bells in Washington for several reasons. Because Chinese dual-use R & D funding often falls outside the formal

¹ <https://www.foreignaffairs.com/articles/united-states/2020-07-29/can-chinas-military-win-tech-war>

PLA budget, it can be hard to track and may be quite high. One recent study of the Chinese defense supply chain by the research firm C4ADS noted that at least six quasi-private investment groups partially or wholly own at least 232 companies involved in China's defense-procurement network². It is all too easy for Western companies and institutions to unwittingly contribute to the PLA's advancement, given the several array of contractors, subcontractors, academic institutions, and semiprivate investment groups involved in civil-military fusion.

3. In spite of this, the authors conclude that China's bureaucratic and authoritarian approach to civil-military fusion is likely to waste considerable time and money. By trying to control innovation, Beijing is more likely to delay and even stifle it and therefore suggest that the U.S. should build on existing advantages in research and technology—advantages that are increasingly at risk not because of China but because of a lack of agility and creativity among U.S. planners and policymakers. With forward-looking changes in the Defense Department and smart investments across government, the U.S. could secure the edge in defense capabilities on its own terms. Many steps in this direction have already been taken by the U.S. and many are in the pipeline.

4. The U.S. military has cooperated extensively and effectively with universities and private companies for decades. In the 1930s, it founded national labs that proved critical technology in the field of supercomputing. It collaborated with Texas Instruments and Fairchild Semiconductor to develop microprocessors. In 1958, it created the Defense Advanced Research Projects Agency (DARPA), which helped develop GPS and the Internet. Most recently, the Silicon Valley-based Defense Innovation Unit, founded in 2015, has helped innovative startups gain a foothold at the Pentagon. China seeks to create similar institutions. It's Central Commission for Integrated Military and Civilian Development has been likened to DARPA, and Chinese reporting has compared a new PLA outpost in Shenzhen (a Chinese tech center) to the United States' Defense Innovation Unit (DIU).

5. Trump administration and several members of Congress have called for broad visa restrictions to prevent Chinese students from studying science and technology in the United States. The Trump administration recently revoked the visas of Chinese students and researchers affiliated with any "entity in the PRC that implements or supports the PRC's 'military-civil fusion strategy.'" Narrowly defined, this makes perfect sense. It is essential to strictly limit access to some research programmes in order to protect national security. Washington has also—wisely—tightened both export controls and restrictions on Chinese investments in cutting-edge U.S. tech companies through the Foreign Investment Risk Review Modernization Act.

6. The authors have offered valuable suggestions for maintaining the technological edge by the U.S. The United States should push its own defense sector to be more agile and innovative—not by emulating civil-military fusion but by working with, rather than dictating to, actors outside of government. Partnering with the private sector on collaborative disruption will require upfront investments and streamlined approaches for getting the best commercial technology into the Department of Defense.

² *ibid*

7. Washington must invest more in key emerging technologies. Direct federal investment is vital to progress in quantum computing, synthetic biology, semiconductors, and military-use artificial intelligence. Although the Trump administration's fiscal year 2021 budget request holds defense research, development, test, and evaluation (RDT&E) funds essentially flat, this is not enough. Congress should expand this segment of the budget. Congress should push the Defense Department to use that space, especially in areas where China is investing heavily and the United States is moving too slowly—such as autonomous undersea vehicles and counter hypersonic missile capabilities.

8. Finally, the defense workforce needs to have the right training and incentives. Government contracting typically takes too long, requires specialized knowledge to navigate, and creates significant barriers to entry for new players. There are ways to deter waste and abuse and still reward innovation that efficiently advances military effectiveness. Rewarding technological know-how and agile problem solving in military and civilian acquisition can help change the culture. So can more opportunities to hire people directly from industry or research institutions into the senior civilian government or even the military ranks and expanding the number of temporary fellowships for private-sector experts to spend a year or two in government.

9. With such concrete steps, the United States can secure the advantage in defense capabilities on its own terms. It is to the United States' benefit that China is looking backward: its approach risks delaying innovation by trying to control it. There is no reason why the United States should make the same mistake.