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ANALYSIS

China's Ambitions for AI-Driven Future Warfare

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The Chinese Communist Party (CCP) sees advanced technology as one of the keys to victory in its challenge to global order in this century. CCP General Secretary Xi Jinping has pronounced that the world is on the precipice of a “fourth industrial revolution” centered upon artificial intelligence and autonomous technology. China is mobilizing every sector of society to contribute to the state’s grand technological ambitions in its long-term struggle against the United States.

Nowhere is this clearer than in the realm of military affairs. China’s People’s Liberation Army (PLA) is racing to integrate futuristic technologies into its historically less-advanced military. The PLA has coalesced around a new organizing concept for how it thinks that advanced technologies will affect warfare in this century. “Intelligentization” represents China’s vision for a new revolution in military affairs. This little-known new concept is driving the PLA’s modernization efforts and signals the expansive ambitions the People’s Republic of China (PRC) has in challenging American military dominance globally.

China’s Dreams for Future Warfare

Intelligentization is the third of the PLA's official goals in the sequence of modernization. The first is "mechanization," which is concerned with acquiring basic weapons systems that can deliver firepower against the adversary. Chinese strategists drew powerful lessons from what they see as the apogee of "platform-centric" warfare during the Second World War, when the United States dominated with mechanized formations like carrier battle groups. They argue that this warfare lies in the "physical space." The PLA announced that it had achieved mechanization in 2020.

"Informationization" is the PLA's second official benchmark for military modernization. The PLA famously learned the principles of informationization during the 1991 Gulf War, when the United States demonstrated the devastating potential of a technologically-advanced military in modern warfare. It resides in the "information space," and it tasks the military with acquiring systems that can collect and efficiently process battlefield information. After the Gulf War, the Chinese military became determined to catch up to the United States technologically and has not looked back since.

Intelligentization is the next phase of military modernization for the PLA. Chinese strategists say that it centers upon the "cognitive space" in which effective decision-making and complex thinking provide the decisive advantage. Chinese theorists think that intelligentization will represent changes as significant as those seen in the Second World War and the Gulf War, if not bigger.

Applying AI

This new type of warfare depends on the application of AI at both the operational decision-making level and for frontline combatants. Chinese strategists believe that AI will work side by side with commanders. One way they believe this will happen is through "battlefield perception systems" in which the computer provides the commander with possible target sets to choose from. This melding of human creativity and robotic computer power will help the PLA "realize human self-transcendence."

With AI taking a larger role in decision-making, Chinese strategists think that future warfare will become an arms race for which the state can produce computers that have the quickest computing capacity. Wartime commanders will be armed with supercomputers that will come to surpass the decision-making abilities of the humans directing them. PLA theorists call this "algorithmic warfare."

PLA strategists think that frontline combatants will be gradually phased out and replaced with intelligent swarms of drones that will give operational commanders complete control over the battlefield. Chinese theorists believe that drones will have the strongest impact in the air domain. They see unmanned aerial vehicles (UAVs) as having two major impacts on air warfare. The first is called "swarm warfare," wherein masses of intelligent robots overwhelm the enemy. The second, called "unmanned-manned cooperation," envisions "mothership" fighters directing groups of unmanned systems. Over time, the tactical level of warfare will almost entirely be comprised of robots.

With computer-enhanced commanders perfectly directing automated robotic frontline combatants, warfare will change drastically. Chinese strategists think war will begin to resemble something akin to a video game. In this environment, PLA theorists see future warfare as prizing psychological warfare with the operational commanders' mental state as the decisive point of war. The PLA's goal will be to outsmart the enemy and reduce the adversary's will to resist.

These changes are believed to result in nothing less than a revolution in warfare as we know it. Chinese strategists say that warfare will come to resemble "mythological fiction" and that the technology of Star Wars will be available in the near future. These Chinese strategists believe whichever side can better intelligentize its force has the potential to leapfrog its enemies in unimaginable ways.

Achieving Ambitions with Industrial Policy

These long-term ambitions put stiff demands on a Chinese economy that still lags behind the United States in some key measures of technological sophistication. Consequently, the Chinese state is undertaking a massive program of industrial policy to arm the PLA with what it needs to intelligentize. Most famously, the Made in China 2025 policy prioritizes gathering global technological supply chains within the PRC. The Chinese state has already invested billions of dollars in building an indigenous semiconductor industry. China continues to steal American intellectual property on a monumental scale. These concerted efforts demonstrate just how serious the Chinese state is in achieving its envisioned leapfrog development over the United States. But PRC investments in quantum computing and drone technology are specific examples of how Chinese industrial policy connects to the PLA's future intelligentization ambitions.

Quantum Computing: Quantum computing belongs to an emerging cutting-edge group of technologies that until recently have only seemed to belong in sci-fi movies. Current computers operate on "bits," which make calculations based on a system of ones and zeroes. Quantum computing would instead use "qubits" that could exist at any value between one and zero. This futuristic technology, then, could theoretically entail increases in calculating speed that are simply impossible to imagine. The CCP recognizes the extraordinary potential of quantum computing. It is investing billions of dollars into its development, directing the cooperation between the public and private sectors with "Military-Civil Fusion," and drawing the greatest minds to efforts with the "Thousand Talents Plan," among other efforts.

If these Chinese investments in quantum computing pay off on the scale that Chinese strategists hope for, and American policymakers are concerned about, intelligentization could well be within the PLA's grasp. After a test in November 2021, Chinese scientists claimed that their quantum computer completed a task in a little over an hour that would take today's fastest supercomputer eight years to finish, although there is no way to publicly confirm these findings. These miracle machines could serve as the robotic assistants that Chinese strategists envision helping operational commanders draft battle plans and select ideal target sets. With these computers, human ingenuity and robotic calculating ability could be married in heretofore unimaginable ways.

Drones: China has also identified drones as a key technology for development. The PRC is becoming a global leader in UAV development in both the commercial and military sectors. Its drones are famously cheaper than their American counterparts, and China produces by far more drones in the commercial sector than any other single country. Chinese drone capabilities, however, are mostly still controlled by humans.

With its rapidly advancing drone capabilities, the other side of intelligentization may be plausible as well. If Chinese engineers are able to increase the autonomy of their drones over time, these machines could theoretically become capable enough to operate independently of close human coordination; they could even cooperate together to create autonomous armies to the menace of China's adversaries. This threat is multiplied in the Chinese context, because the country's tremendous manufacturing capacity provides near-infinite possibilities for a massive fleet of drones.

Quantum computing and drones are only two examples of grandiose CCP ambitions in technology. Myriad other Chinese technological efforts hold similar potential for the PLA's intelligentization and thus its warfighting abilities. This is an across-the-board effort that fundamentally threatens the technological edge that has been the basis of American military superiority for decades.

Drawbacks in Chinese Thinking

Chinese dreams of intelligentization are not without their flaws, however. Most importantly, the CCP's vision for AI betrays the PLA's predilection for over-centralization of command authority and top-down orchestration of military assets. With operational commanders advised by computers directing smart swarms of drones, there will be few opportunities for distribution of efforts and lower-level initiative. The principles of intelligentization fly in the face of modern visions of the much vaunted "mission command," which prizes decentralization of authority and individual and small unit initiative. Failure from any one Chinese commander could be disastrous in an intelligentized PLA.

Additionally, it is worth keeping in mind that AI is not destined to provide all of the benefits that the PLA hopes for. All algorithms necessarily mirror the presumptions that the AI designers hold and are often limited by them. In the past, technological revolutions have precipitated kinds of changes in warfare that contemporaries could never imagine. In future warfare, AI may not be able to adjust to the new realities and inherent uncertainties of warfare in the same way that humans can.

Lastly, the elevated status of intelligentization in Chinese doctrine will more closely couple the PLA's warfighting capabilities with China's continued technological development. If the PRC cannot continue to introduce new military innovations to the PLA, Chinese military doctrine will float adrift. This is a possibility to take seriously. China is showing accelerating signs of a flagging economy, with the headwinds of immense debt and a heavy demographic burden, among other challenges. In addition to technological limitations, competing resource priorities may also weigh on the PLA's intelligentization potential.

Challenges & Opportunities for the United States

These developments present multiple warnings and opportunities for the United States. Most importantly, the PLA might achieve its grand ambitions for an intelligentized force. In this warfighting environment, the American way of war might be at severe risk. The U.S. military could find itself outmatched and unprepared in an Indo-Pacific war scenario. Of course, the United States should prepare itself for this possibility and experiment with the potential that an AI-enabled adversary could have. An intelligentized Chinese military would nonetheless be vulnerable to adversary counteractions. Most importantly, Chinese aspirations for a highly centralized artificial intelligence system would be vulnerable to different types of options, such as electronic warfare.

The United States should watch China's technological investments closely and do everything it can to guard its superiority in technology. These developments should highlight the urgency of the Department of Defense's efforts to work more closely with Silicon Valley and other technology hubs through the United States and key allied countries, to ensure that private sector advances in AI and autonomous systems are swiftly adopted by the U.S. military. While the Chinese state has advanced rapidly with massive top-down investment, the American private sector remains one of its most important competitive advantages.

Preparing for this Century's Military Competition

The United States and China have entered an era of prolonged military competition. With the shadow of the PLA hanging over Taiwan, the South China Sea, and the East China Sea, it is more important than ever to understand the potentially revolutionary changes that the Chinese military envisions for itself in this century. China believes that rapid advances in artificial intelligence and autonomous systems will radically change warfare, and it is planning to make that dream a reality.

The revolution in AI is not only crucial for China's military. The CCP sees AI development as part of a broader "intelligent era," with AI changing all parts of society. This era will be driven by a fourth industrial revolution that the PRC is sparing no expense to use to leapfrog over its adversaries. Chinese strategic culture prizes the role that technology plays in the development of warfare, so the CCP believes that if it can get an edge over the United States in this phase of technological development, it will capture the decisive advantage it needs in the geopolitical competition. The world may be on the verge of a new kind of warfare for which the United States is not yet ready.

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