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The Dual-Use Dilemma in China's New AI Plan: Leveraging Foreign Innovation Resources and Military-Civil Fusion

By **Elsa Kania** Friday, July 28, 2017, 9:30 AM

On July 20, China's State Council issued the "New Generation Artificial Intelligence Development Plan" (新一代人工智能发展规划), which articulates an ambitious, three-step agenda for China to lead the world in AI. The Chinese leadership recognizes that AI will be critical to its "comprehensive national power" and competitiveness, including in national defense. Through this new strategic framework, China will undertake a "three in one" (三位一体) agenda in AI: tackling key problems in research and development, pursuing a range of products and applications, and cultivating AI industry.

China wants to become a "premier global AI innovation center" by 2030. This plan seeks to redress current shortcomings and build up indigenous capabilities in innovation. The effort will include extensive government funding and investments, along with a focus on attracting and developing leading talent in AI. China will pursue cutting-edge research and development that could enable paradigm changes, including brain-inspired AI and quantum-accelerated machine learning. The Chinese leadership thus hopes to "occupy the commanding heights" of AI science and technology, leapfrogging the U.S. in the process.

Consequently, China plans to coordinate and optimize its use of both domestic and international "innovation resources." Of note, the plan calls for encouraging cooperation between domestic AI enterprises and leading foreign universities, research institutes, and teams. China will encourage its own AI enterprises to pursue an approach of "going out" (走出去) through overseas mergers and acquisitions, equity investments, and venture capital, while establishing research and development centers abroad. Concurrently, China will encourage foreign AI companies to establish research and development centers in China. China will also leverage the "One Belt, One Road" strategy to establish bases for international scientific and technical cooperation and joint research centers focused on AI.



Through such measures, China will continue seeking to leverage foreign advances and expertise while still in the process of building up the capacity for independent innovation. For instance, Baidu established its Silicon Valley Artificial Intelligence Laboratory (SVAIL) in 2014 and announced plans to establish a second laboratory in Silicon Valley in early 2017. In the fall of 2016, Huawei announced it would invest \$1 million in a new AI research partnership with the University of California, Berkeley. This spring, Tencent revealed its intention to open its first AI research center in Seattle. Recently, CETC, a state-owned defense conglomerate that pursues dual-use research and development, also established a joint research center with the University of Technology, Sydney, which will focus on big data, AI, and quantum technologies.

Against the backdrop of current U.S. debates on CFIUS and recurrent concerns over Chinese investments in sensitive start-ups, this approach may prove controversial and could provoke further friction. For instance, this spring, Baidu acquired xPerception, which specializes in computer vision. In mid-2016, Neurala, a Boston-based start-up that makes AI software, based on technology initially developed for use by the U.S. Air Force and NASA, received Chinese investment from Haiyin Capital, which raised concerns about potential Chinese access to the associated technologies, given the clear military applications.

Several aspects of China's strategic approach to AI inherently raise a dual-use dilemma and concerns. This new plan explicitly highlights an approach of military-civil fusion (or civil-military integration, 军民融合) to ensure that advances in AI can be leveraged for national defense. Accordingly, China plans to ensure that scientific and technological advances can be readily turned to dual-use applications, while military and civilian innovation resources will be "constructed together and shared" (共建共享). As such, certain ventures or technology transfers could eventually be leveraged to support future military capabilities.

This focus on civil-military integration in AI is consistent with a national strategy directed by the Military-Civil Fusion Development Commission (中央军民融合发展委员会), which was established in early 2017 under the leadership of Xi Jinping. The concept of "military-civil fusion," which is actualized through an expansive policy agenda, has been integral to China's efforts to advance its defense industrial base. Even as China tries to build the indigenous capacity for "innovation-driven" military and civilian development, technology transfer has continued to be and may remain an aspect of this effort.

As the PLA intensifies its focus on future "intelligentized" (智能化) warfare, its ability to leverage all available resources and the latest technological advances will be critical. To achieve this objective, China intends to establish and normalize mechanisms for communication and coordination among scientific research institutes, universities, enterprises, and military industry units. In particular, China wants to apply new-generation AI to support command and decision-making, military deduction, defense equipment, and other areas.

The implementation of military-civil fusion will support China's effort to ensure that AI technology can be quickly leveraged to support national defense innovation through the "sharing and common use" (共享共用) of technologies. Certain of the "new generation" AI technologies that this new plan prioritizes will inherently have both civilian and military applications. For instance, China intends to achieve advances in human-machine hybrid intelligence, swarm intelligence, and automated decision-making, as well as autonomous unmanned systems and intelligent robotics.

China is not alone in its focus on the militarization of AI; the U.S. military is also pursuing multiple military applications of AI under the aegis of the Third Offset strategy. However, this new plan highlights that the CCP takes a state-driven approach to industrial policy that should be recognized as distinct from that of the U.S., including with regard to underlying relationships between the government, enterprises, and the military. With military-civil fusion elevated to the level of national strategy, China has the capacity to take full advantage of the dual-use character of this technology.

Looking forward, the U.S. and China will necessarily continue both to compete and to collaborate in AI. However, China's new plan reflects the government's intention and deliberate plan to continue to leverage foreign "innovation resources" to advance its own AI capabilities, while ensuring that relevant advances in AI are readily available for military use. China does remain highly focused on a variety of commercial and governmental applications of AI. There are plenty of cases, including issues of safety and standards, in which collaboration is warranted and may be mutually beneficial. Concurrently, it is clear that international cooperation in science and technology is critical to advancing the frontier of knowledge. However, U.S. engagement with China in AI should be calibrated based on an awareness of its official strategy for military-civil fusion and the resulting dual-use dilemma associated with potential transfers of knowledge, expertise, and technology.

In this context, while an update to CFIUS is certainly warranted, the U.S. response to China's rise in AI must extend far beyond CFIUS. The U.S. should focus on ensuring adequate funding, leading talent, and enabling policies, while pursuing appropriate national and international cooperation to ensure future competitiveness. Although these issues can be readily hyped or politicized, the underlying challenges remain highly complex and nuanced. If the U.S. response to these issues of technology transfer is not adequately targeted and sophisticated, there could be significant unintended negative consequences for U.S. advances in AI, such as redirecting investment away from U.S. start-ups. To ensure a dynamic innovation ecosystem, the U.S. must enable and support the global flows of idea, talent, and capital that promote continued world-class leadership, while seeking to mitigate the resulting risks.

China's new AI development plan should also serve as a timely reminder for the U.S. of the critical importance of building national capacity and competitiveness in this vital emerging technology. To date, the U.S. has yet to create a national strategy and policy framework that might ensure continued U.S. innovation in AI, despite the release of a National Artificial Intelligence Research and Development Strategic Plan in the fall of 2016. For the U.S., it will be vital to prioritize educating and attracting AI talent, while ensuring adequate investment in start-ups and funding for long-term research and development. In addition, the U.S. should start to consider new legal or regulatory frameworks, along with policies to mitigate safety issues and the potential for massive job losses as AI and other emerging technologies disrupt current employment patterns. Future U.S. economic competitiveness and military capabilities will depend upon continued innovation in such strategic emerging technologies and the associated policy frameworks.

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