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Pentagon Should Take the Lead on Tech

U.S. military systems lag behind rivals', and defense leaders depend on Silicon Valley to try to keep up.

By Mackenzie Eaglen

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Two F-22 Raptors fly during an aerial refueling mission, July 29. PHOTO: CHRIS DRZAZGOWSK/U.S. AIR FORCE/HANDOUT/REUTERS

In the global arms race, a moment's hesitation is enough to lose your lead. The Pentagon pioneered research 15 years ago into hypersonic missiles that can cruise at Mach 5. The U.S. then chose not to develop the technology—but China and Russia developed it. Now Beijing and Moscow have hypersonics at the ready and, according to Pentagon research chief Michael D. Griffin, no number of current U.S. ships or ground-based antimissile systems would be enough to counter a massive attack.

The problem stems in part from the Pentagon's increasing dependence on outside firms. For decades after World War II, the Defense Department was a producer of cutting-edge research and technology, but today it contracts more and more out to Silicon Valley. No longer setting its

own course for development, the Pentagon is unable to take the major leaps that once kept U.S. military technology racing ahead.

The Pentagon still acquires its systems in accordance with decades-old protocols that value compliance over nimbleness and usefulness. It has doubled down on unreasonable demands to own intellectual property in perpetuity, a nonstarter for many software companies with which it contracts. Now defense leaders are stuck having to sort out which software systems might pose a security risk because the developers often also sell to America's rivals.

This shift from calling the shots to negotiating with ever-more-private interests is new for the defense bureaucracy. For generations, influence flowed in the other direction. The buildup in defense research-and-development spending that began in the late 1940s and continued through the '80s was responsible for propelling many of the tech breakthroughs of the past century: cellphones, jet engines, integrated circuits, weather satellites and the Global Positioning System. A recent example is Apple's Siri artificial-intelligence system, which it purchased from the Defense Advanced Research Projects Agency.

Today the Pentagon spends more on systems and operations than on equipment, and does so poorly and slowly. The software in the F-22, America's most advanced air-superiority jet fighter, was out of date by the time the first plane was airborne.

As a consequence, the Pentagon's list of systems that need improvement now bears an unfortunate resemblance to a list of China and Russia's strengths. Both nations excel at directed energy, hypersonics and cyber and information operations. China has already developed quantum satellites that are purportedly hack-proof. Many U.S. satellites are susceptible to data breaches as well as "spoofing"—co-opting a satellite to send false information.

One solution is for the Pentagon to bring more technology development in-house and design systems using a software-first approach. A generation ago, the U.S. military had a large enough advantage over its peers that it could take 20 years to design and build a system and then stick software in it. Today, the speed of innovation makes that impossible. It creates the harmful incentive for the military to contract its services out to big tech firms, which are abreast of the latest trends.

The Pentagon must also improve its R&D planning process to translate basic research into action sooner, before the systems have become irrelevant or overmatched. Technology researchers need to think especially about how to deploy more quickly weapons and security systems that require tech specifications like advanced algorithms, precision guidance and reliable connectivity.

A renaissance in military-led innovation is overdue. Defense R&D in past generations was prestigious enough to draw the brightest young people to study science. It created lucrative employment opportunities while tackling tough national problems. Just over a decade ago, defense-related jobs employed about 1 in 10 of the nation's software and electrical engineers, 1 in 5 physicists, 1 in 4 astronomers and mathematicians and 1 in 3 aerospace engineers.

Today the Pentagon is behind on generating innovation and is becoming a mere customer in the technology sector. As Mr. Griffin says, the military is "struggling to become the flea on the tail of the telecoms' dog." A reinvigorated military technology portfolio and more-aggressive use of agile purchasing rules would help regain some of the nation's lost innovative edge. But there's no time to waste. Perhaps being in second place will be enough to instill urgency and drive reforms in a bureaucracy accustomed to always being on top.

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