



To Win the Technology Competition, the United States Must Invite and Empower

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Can the United States win long-duration technological competitions with authoritarian states? In the decades following the Cold War, the answer seemed unequivocally clear: the American approach of empowering individuals unlocks unrivaled innovation.¹ Now, some wonder again whether democratic societies can counter the pace of technological progress made by states that fuse political and industrial capabilities.² By many measures, skillful integration of authoritarian political power with industry can be a powerful strategy for economic and technological advancement.³ This approach rests on a strategy to **coerce** and **control** innovation processes. Efforts to coerce and control include dictating capital flows,⁴ crowning national champions,⁵ forcing technology transfers,⁶ and controlling business performance.⁷ Through these practices, modern authoritarian states have made considerable advances in critical technology areas such as artificial intelligence,⁸ biotechnology,⁹ quantum,¹⁰ advanced manufacturing,¹¹ and others. For the United States and its partners, the uncomfortable reality is that authoritarian strategies can amplify technological progress in powerful ways.¹²

In response, the United States must remember that the American approach to empower its people provides asymmetric technological advantages that cannot be imitated by authoritarian states. While some global powers coerce and control their people, the United States is fundamentally positioned to **invite** and **empower**.

We argue that the United States can achieve renewed technological advantages over authoritarian powers by embracing the quintessentially American approach of civil empowerment. A strategy of civil empowerment is possible through the values of diversity, civic participation, openness, and competition. In this article, we highlight how the United States previously achieved technological advantages through civil empowerment and identify ways that the United States can once again embrace this approach.

Inviting civil society into national technological development and achievement has been an American approach since the foundation of the scientific research enterprise. Consider key technological achievements in the last century. The Manhattan Project needed the participation of academic, scientific, industrial, and political communities for an unprecedented national security achievement. The race to put an American on the moon required vast contributions across the next generation of American society. More recently, Operation Warp Speed required the rapid cooperation of private research laboratories, government agencies, and businesses to develop and produce vaccines at scale.¹³ The United States' signature scientific achievements rarely happen in isolation but rather require extensive contributions from individuals empowered to think and act anew. These and other massive projects represent what is best about democratic achievement. Unfortunately, these examples share another commonality: they were instigated by crisis.¹⁴ Thus, the United States must generate similarly ambitious, open, collaborative initiatives in a proactive manner, not a reactive one. Understanding how and why inviting and empowering is a unique tenet of American society can help us to do more of it.

Four core values directly feed into the United States' ability to invite and empower its people to achieve technological development: **openness**, **civic participation**, **diversity**, and **competition**. These values supercharge innovation and are part of what has made the United States unique in world history. But principles require investment. The United States can and should do more to foster the values which underlie civil empowerment.

Openness as an American value contrasts with how many global competitors operate. Openness includes sharing resources, tools, and ideas between the public and private sector. Some argue that openness is a necessary step to

solving some of society's most pressing scientific challenges.¹⁵ There are places across our federal research enterprise that take this fundamental value as a core component of their innovation lifecycle. NASA uses crowdsourcing as an approach and found that outsiders identified solutions to some of the organization's most vexing technical problems, including a groundbreaking method to forecast solar events.¹⁶ Additional examples abound, especially in the decade since the passage of the America COMPETES Reauthorization Act of 2010, which provided authority to every federal agency to carry out prize and challenge competitions. These competitions directly engage non-federal individuals and entities "to stimulate innovation that has the potential to advance the mission of the respective agency."¹⁷ Similarly, an "open topic" approach to soliciting ideas from technology companies enabled the Air Force to create contracts with over 1,000 small businesses that had never worked with the Air Force before.¹⁸ Research on the process demonstrates that these companies tended to be more innovative, as measured by patent novelty, and more effective, as measured by follow-on contracts and private capital investment.¹⁹ Those successes prompted a 2022 congressional mandate that each of the military services offer annual open topic solicitations. Looking toward the future, a strategic approach based on the value of openness may revitalize prize and challenge competitions and other alternative crowdsourced funding approaches to explore critical technologies.

The American value of **civic participation** is manifest as individuals engage in local and national interests for the public good. New programs harness this value by providing opportunities to participate across the private sector, the public sector, and academia through fellowships, details, advisory committees, and sabbaticals. For example, the U.S. Digital Service provides consulting services to federal agencies from industry professionals committed to short-term "tours of civic service."²⁰ Likewise, the Defense Science Board, the Defense Innovation Board, and others include former senior military and government officials who partner with academic and industry leaders to bring private sector expertise to address the Department of Defense on its most salient technological challenges.²¹ At the Defense Innovation Unit, the talent matching program Gig Eagle connects military reservists with specific areas of civic expertise to urgent technology needs of the Department.²² In both basic research and manufacturing, public-private laboratories, regional professional networks, and other partnerships each provide shared resources for industry, academia, and government. One novel organization, Manufacturing USA, promotes private and public advancements through a network of regional institutes focused on advancing the development and commercialization of emerging manufacturing technologies.²³ Increased civic participation could include expanded use of flexible hiring authorities, growth of federal fellowship programs specifically targeted at technologists, and additional opportunities for time-limited tours of duty for civil servants to work in the private sector.

The United States' competitive innovation advantage is strengthened by the **diversity** of its people. Diversity in talent, experience, and creativity helps drive novelty in innovation ecosystems.²⁴ Even disciplines as diverse as epidemiology and scientific policy converge on the concept that diversity enhances innovation outcomes.²⁵ The enlivening effects of diversity on innovation are on display across the government. For example, recent Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) funding programs invite the talent and insights of underrepresented groups, including women-owned businesses, Historically Black Colleges and Universities graduates, and veterans,²⁶ leading to technological concepts not previously considered in government organizations.²⁷ The Department of Energy (DOE) increased access to diverse perspectives through the "Inclusive Energy Innovation Prize," for which 80% of the applicants had never applied to DOE programs before, including many from historically underserved communities.²⁸ Beyond diversity in grantees for federal funding programs, the federal government has also committed to a strategic plan to advance diversity, equity, inclusion, and accessibility across the federal workforce, providing a systemic approach to enhancing the diversity of ideas we can harness.²⁹ Solving complex technological problems requires new ways of thinking, and strengthening diversity in innovation programs is an efficient and effective way to spur novel thinking.

Lastly, **competition** spurs American innovation through market-based institutions with powerful incentives.³⁰ Because free markets reward performance, firms have persistent motivation to stay ahead of competitors or risk technological obsolescence.³¹ This is also true for nations.³² Fast-paced technology innovation often requires large infusions of capital, and the United States features the largest, most liquid, and most efficient capital markets in the world.³³ Financial intermediaries—venture capital, private equity, public equity, banks, and others—provide the fuel for competitive technology development. The United States government has the opportunity to harness this national advantage by partnering with private capital providers where incentives and interests align. For example, the Small

Business Administration's (SBA) Small Business Investment Company program provides access to billions of dollars annually to investors who can then convert the funds into long-term equity investments in American small businesses,³⁴ which have included Intel, Apple, and Tesla in their early stages. The U.S. government can expand its use of financial tools from the Small Business Administration and other departments and agencies to partner with private capital providers and technology companies. Areas of shared interest could include advanced manufacturing, technology infrastructure development, deep technology, or supply chain resilience for both economic prosperity and national security. The American spirit of competition—and the world's premier financial institutions that emerged because of it—provides the United States with an unmatched ability to advance critical technologies by inviting and empowering capital markets and innovators.

There is power in inviting and empowering the American people through the values of openness, civic participation, diversity, and competition. Pockets of success exist through multiple government programs that invite and empower the private sector, but these programs represent the exception to norms in our current approach to technology competition. Many in the American private sector, particularly capital providers, are eager to participate in national interests,³⁵ but the United States government has not done enough to invite and empower its people.³⁶

Reinvigorating a strategy of civil empowerment is essential to how the United States will compete technologically against authoritarian powers. This strategy of inviting and empowering promotes creativity, opens collaboration between the private and public sectors, and accelerates the development and adoption of critical technologies. While global competitors coerce and control their people to achieve technological superiority, the United States has an unmatched ability to invite and empower. The United States has previously achieved technological advantages over authoritarian powers through civil empowerment, and the nation's own history provides a blueprint for how to renew competitive advantages in the strategic competitions ahead.

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The views expressed are those of the author and do not reflect the official guidance or position of the United States (U.S.) Government, Department of Defense, United States Air Force or United States Space Force.

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