SPECIAL COMPETITIVE STUDIES PROJECT

2023 Year in Review

SIX ITEMS TO WATCH IN 2024

SPECIAL COMPETITIVE STUDIES PROJECT

Key Takeaways from 2023

Technology and national security intertwined in crucial ways across three major arenas in 2023: (1) a troubling emergence and convergence of an "axis of disruptors" across the geopolitical landscape, (2) the United States is beginning to take concrete steps to organize for the techno-economic competition with China, and (3) the rapid proliferation of AI-enabled platforms that promise to reshape our societies, economies, and national security.

1. Technology: Authoritarian Tech Axis Forms Around the Ukrainian War.

In 2023, authoritarian nations aligned with Russia to provide tech, weapons and aid. Iran has been providing military assistance to Russia, including hundreds of one-way attack drones and drone production-related equipment. This support has been crucial to Russia's efforts in the Ukraine war, as drones have been used to attack Ukrainian targets and disrupt supply lines. Iran is also helping Russia build a drone manufacturing plant east of Moscow, which could be operational early next year.

The People's Republic of China (PRC) has supplied a spectrum of tech support to Russia for the war. First, it is clear that China is or is trying to supply drones and parts to Russia. Second, China is filling the gap in microelectronics created by sanctions that are needed for Russia's war machine. Third, China's growing satellite imagery capability is being used by Russia to identify Ukraine military targets. Finally, and indirectly, one of China's main tech platforms, TikTok, has been particularly helpful in spreading Russian propaganda about the war.

To round out the authoritarian tech axis, North Korea also appears to be playing into drone supply for Russia. Likewise, the reported supplying of North Korean ammunition and other war materials has been a game changer for the Russian war machine.

Before this war, it was plausible that a technology alliance between China, Russia, Iran, and North Korea would be a natural partnership that the democratic coalition could face someday. The Ukraine war has revealed what many assumed: in time of conflict, authoritarian regimes will form a tacit axis of disruption to world order and technology would play a major role.

2. Organized for Competition: Harnessing the Power of AI for National Advantage.

2023 saw major steps taken on AI by the United States at all levels of government. President Biden's Executive Order on Safe, Secure, and Trustworthy Artificial Intelligence provided some certainty amid turbulent debates about governing advanced AI systems. Senate Majority Leader Chuck Schumer, along with his colleagues, Senators Rounds, Heinrich, and Young, convened nine expert AI Insight Forums for legislators - with SCSP testifying - citing the need for Congressional humility and understanding of AI's impacts. In addition, the House Select Committee on the Strategic Competition Between the United States and the Chinese Communist Party highlighted AI among areas for renewed investment.

But it hasn't just been the federal government taking action on AI. Nearly 200 AI bills have been introduced in state legislatures so far this year, over 4 times more than in 2022. The bills aim to regulate AI use cases, require AI governance, create AI inventories and task forces, and address government AI use. However, only 15% of bills have passed one chamber and only 14 became law.

Even local level governments have begun shaping AI policy that has surged alongside state legislatures. Several major cities — Boston, Miami, New York City, San Jose, and Seattle — have created new AI regulations and guidelines. These cover areas like generative AI, automated hiring systems, and impact assessments.

Internationally, key allies took steps to coordinate AI governance and innovation to uphold shared democratic values. The EU advanced its landmark AI Act towards finalization, establishing risk-based requirements for trustworthy AI. The UK hosted an AI Safety Summit with global tech leaders, including from SCSP, to align on responsible development. The AUKUS alliance saw further advancements in jointly promoting AI innovation. In a landmark meeting, the Five Eyes intelligence alliance convened in Palo Alto to address emerging technology trends, potential misuse, and collaboration for

enhancing economic security and public safety. The Quad countries, with key help from SCSP, convened the Quad Technology Business and Investment Forum (QTBIF) alongside the Asia-Pacific Economic Cooperation Summit in San Francisco, bringing together industry partners to boost capital for critical emerging technologies.

3. AI: A Transformative Force with National Security Implications.

If 2022 gave us a hint at the potential of generative AI (GenAI), 2023 showed us early signs of its endless potential. GenAI has emerged as a transformative force, reminiscent of electricity in its potential to reshape our world. This groundbreaking technology is not just a tool for the experts; it extends its reach to every corner of our society, national security, economy, and our daily lives, while also fostering rapid innovation across various sectors. There are near daily reports of advances in healthcare, finance, and data management powered by AI. The influence of AI even extended to the Hollywood strike and was a major negotiating point.

Global AI development, even by competitors like China, is unfolding quickly across domains. While its current GenAI efforts lag behind U.S. platforms, the PRC is among a very short list of nations capable of building and deploying frontier large language models (FLLMs). Moonshot AI's Kimi, however, stands out as a promising contender. It can reportedly handle inputs up to 200,000 Chinese characters, which - *if true* - is eight times more than GPT-4 and 2.5 times more than Anthropic's Claude, which can support 25,000 and 80,000 characters respectively. Democratization of generative AI through open-source access to models, such as the UAE's Falcon, Meta's LLaMA, and France's Mistral promises to expand the number of innovators and spur economic gains, while also lowering the barriers to entry for state and non-state actors to use GenAI, including possibly for nefarious activities.

Six Items to Watch in 2024

The year 2023 provides an important opportunity to solidify some of the tech-centered national security policies and strategies that will position the United States and our allies and partners for the rest of the decade. Going forward, here are six items to watch in the new year.

1. Geopolitics Are Back…Again:

The war in Ukraine remains a technological arms race, emphasizing the need for constant innovation in dynamic warfare, in what Eric Schmidt, SCSP's Chair, has called the first "networked war." However, despite initial optimism with Ukraine's ability to beat back a superior foe, Russia has demonstrated its staying power on the battlefield, as it has gained access to a new dynamic arsenal of weaponry. This is an important reminder that history is not static - the reverberations of this conflict have global implications and without concerted U.S. leadership to support Ukraine's victory, we face a starker world that will be more threatening to the United States and U.S. interests.

If the February 2022 invasion of Ukraine was the geopolitical shock of that year, there can be little doubt that Hamas' terror attack of October 7, 2023, and the scale at which it happened, was the surprise of 2023. While Hamas' relatively "low-tech" deception campaign appears to have misled Israeli intelligence from predicting the October 7 attack (and also provides an interesting contrast to U.S. awareness of Russian plans to invade Ukraine and efforts to "pre-bunk" it), the ongoing fighting has highlighted both sides' use of technology to exploit asymmetries in the conflict. Drones continue to feature on the battlefield, Hamas has used targeted cyberattacks, and Israel has employed AI, in its air campaign in Gaza.

Zooming out, one can see the connection among the disruptors from Iran's provision of drones to Russia, the PRC maintaining a broad economic lifeline to Russia's war machine, and the Russian, Iranian, and, to a lesser extent, PRC government voicing support for Hamas against Israel. And with Taiwan set to elect a new president in 2024, the world faces a potential flashpoint for PRC conflict over Taiwan in January.

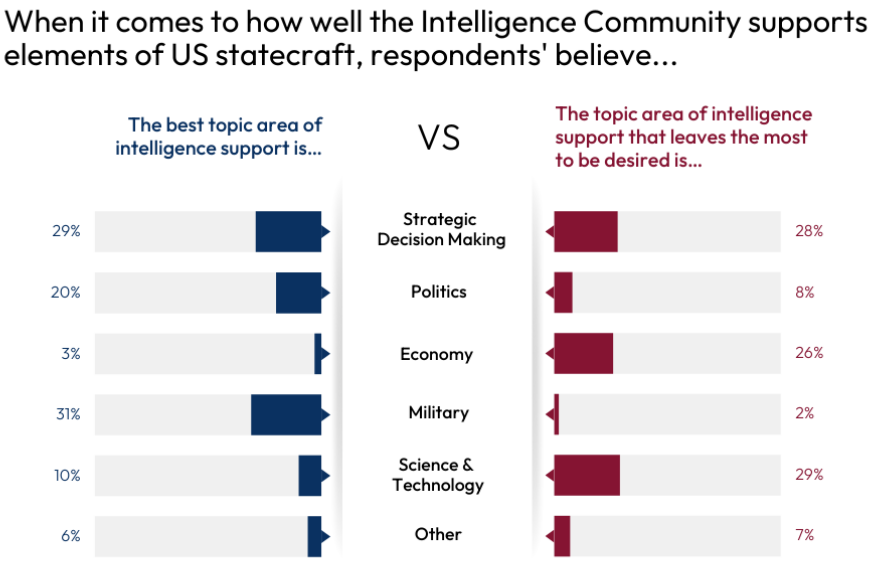
Taiwan's elections in January 2024 sets the stage for the continued battle of narratives between "democracies vs. autocracies," as about 2 billion people go to the polls in democratic elections in 2024. We will also, most certainly, see unprecedented levels of disinformation attacks launched from the mainland against Taiwan. We should look to this crucial election to provide us a window into what other democracies, particularly our own here in the United States, can expect to see in their elections slated for 2024, including the application of new technologies to promote or attack democratic institutions.

But as always, our alliances remain a unique advantage for the United States and its allies. NATO, once considered "braindead," will hold its 75th anniversary in 2024 after adding Finland as its 31st allied nation, and likely adding Sweden as its 32nd. A historic trilateral Summit of the United States, Japan, and the Republic of Korea has invigorated our Asian alliances. And a series of bilateral technology dialogues launched with India, Singapore, and Korea signal the tech-forward alliance cooperation we will need for the Age of AI.

2. Artificial Intelligence Shows Promise for Intelligence Community's Mission:

In the realm of national intelligence, AI's promise is already being tested through bespoke pilot projects aimed at enhancing collection and analytical functions. These early initiatives, while still developing, signal the onset of AI's broader application across the full spectrum of intelligence work. And the new IC Data Strategy for 2023-2025 organizes intelligence elements to make data more interoperable, discoverable, and AI-ready for humans and machines to move beyond these experimental prototypes and scale their implementation. As the pace of innovation swiftly progresses, we expect the shift to a more integrated use of AI within the Intelligence Community (IC) elements and their partners to be not just aspirational, but inevitable.

Moreover, the recently released 2023 National Intelligence Strategy directs the IC to accelerate its adoption of artificial intelligence and advanced analytics to improve timely, accurate insights into competitors' intentions, capabilities and actions across strategic technology domains. This comes as U.S. policymakers and allies actively engage in the global contest for leadership in AI and other critical technologies, making the IC's ability to provide insight into adversaries' emerging technologies and the organizations that field them as vital as understanding traditional political and military institutions. However, a survey conducted by SCSP this past March highlights notable deficiencies in the IC's focus on economic and technological issues compared to conventional political-military topics, with only a minimal percentage recognizing its strengths in these emerging areas and a sizable proportion indicating the need for substantial improvements.



It is within this context that the Special Competitive Studies Project, in concert with the Australian Strategic Policy Institute (ASPI), has launched a symposium of experts—50 seasoned practitioners from government, academia, and the private sector. This project on "Artificial Intelligence, Human-Machine Teaming, and the Future of Intelligence Analysis" is not merely a meeting of minds but will serve as a strategic forum aimed at charting the course of AI and intelligence analysis.

To markedly improve our competitive stance in intelligence analysis, a clear and actionable strategy is vital—one that marries advanced tradecraft with AI innovations through committed and broad-based collaboration. This approach is essential for maintaining the momentum of innovation in a landscape where current analytical tools are falling short, burdening analysts with an unsustainable data deluge. New strategic frameworks must be developed to ensure that the opportunity to enhance intelligence capabilities with AI does not diminish or become mired in inaction. Next steps involve shining a light on specific applications as part of a collective effort to steer the integration of automation into the heart of intelligence analysis.

3. The Future of Warfare is Here and the U.S. Has a Unique Window of Opportunity to Get Ready:

The war in Ukraine, Israeli operation against Hamas, and even Houthi attacks against the free flow of commerce in the Red Sea provide daily, tragic examples of how the character

of war is evolving. Innovations like ubiquitous sensing, meshing of civilian and military sensors, decentralized command and control, abundant use of drones of all sizes and types and for all domains, increased automation of intelligence, surveillance, and reconnaissance, and battlespace management, and relentless information operations and battles of narratives have emerged.

While the changes are profound and possibly the most consequential since the dawn of the last century, the United States also has a unique opportunity to get ahead and re-solidify its military overmatch. There is a confluence of positive developments that - if successfully harnessed - could close both deterrence gaps for the United States and position it for enduring competitions. For starters, there is a growing number of private sector actors in the United States getting involved in activities with clear application in defense and open to collaborating with the Department of Defense (DoD). This was also evident in a series of wargames that SCSP conducted with RAND Cooperation and that brought together technologists from all walks of America's innovation ecosystem to identify existing tech solutions to pressing operational challenges in the event of a Taiwan contingency.

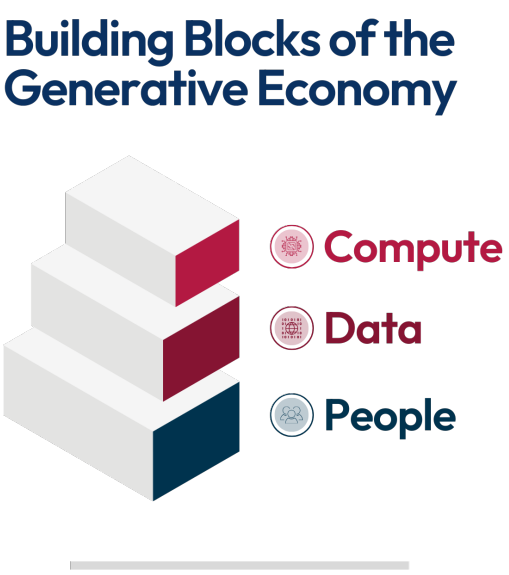
Meanwhile, the Department of Defense also announced two important initiatives - Replicator, which aims to field thousands of autonomous systems across multiple domains within the next 18-24 months, and Task Force Lima, which aims to integrate generative AI across DoD. Both initiatives and the follow on work are in line with the recommendations that SCSP outlined in our Offset-X report and our 2023 memo on Department of Defense Adoption of Generative Artificial Intelligence. The Department also re-elevated the Defense Innovation Unit (DIU) to directly report to the Secretary and appointed Doug Beck, a veteran of DIU, Apple, and U.S. Navy, as its head. (Doug made his debut appearance as a Director at the SCSP-hosted Ash Carter Exchange on Innovation and National Security on May 9, 2023.) And, finally, Congress in its 2024 National Defense Authorization Act, codified DIU and included a provision that allows Service Secretaries to initiate urgent activities to leverage an emergent technological advancement or to rapidly respond to an emerging threat.

4. U.S. Techno-Economic Advantage Faces Key Questions in 2024:

In 2023, the United States advanced its position in the techno-economic rivalry with China along three major fronts: GenAI, microelectronics, and economic resilience. But in all

three areas, the work remains unfinished and critical questions loom large for American leadership and collaboration with allies and partners.

If 2023 saw the United States strengthen its position as the world leader in GenAI, then 2024 will start to reveal the degree to which that leadership position translates to other technology battlegrounds. Recent months have seen increasing interest in "knowledge models" – large AI models trained on specialized domain knowledge, rather than open source information scraped from the Internet. Domain specific models can power GenAI applications tailored to achieve specific tasks across tech fields like AI-enabled materials discovery, robotics, and factory automation. Like other general purpose technologies, the productivity effects of GenAI will likely take time to appear in the macroeconomic data. But in the meantime, the United States should continue to invest in the fundamental building blocks of AI leadership: Data, Compute, and People – working with allies and partners wherever possible to maximize democratic advantage.



Second, microelectronics are the key enabling technology of the digital age, as demonstrated by a growing focus on specialized AI chips (graphics processing units, or GPUs) in 2023. In the age of AI, national power is increasingly a function of compute power. But while the race to build supercomputers powered by more and more AI chips continues, traditional ways of producing microelectronics are bumping up against the laws of physics. Ultimately, moving to a post-Moore's Law era will require more investment in novel compute paradigms. In November, SCSP published a National Action Plan for U.S. Leadership in Advanced Compute and Microelectronics, proposing moves that could propel the nation toward a bolder future. Implementation of R&D programs in the CHIPS & Science Act – especially the National Semiconductor Technology Center (NSTC) – will be a key area to watch in 2024. The NSTC's research programs will determine whether the nation adopts a moonshot strategy that embraces disruptive innovation, or whether it steers towards a more incremental approach.

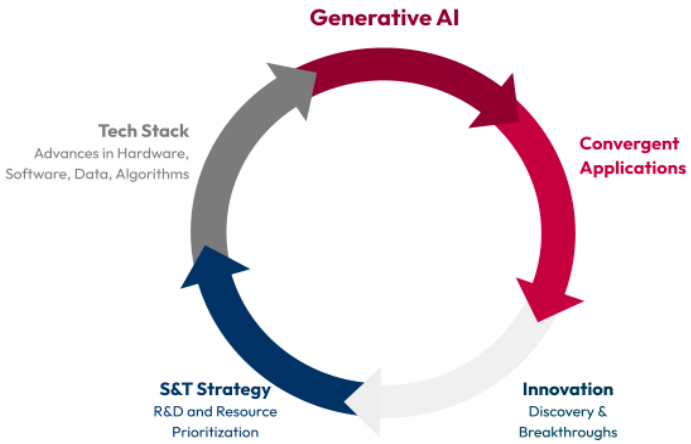
Lastly, 2023 has punctured investors' faith in the sustainability of China's economic model, as decades of debt-fueled investment in infrastructure and heavy industry have led to deep structural imbalances in the Chinese economy that are now revealing themselves in stark relief. Chinese consumers are pessimistic about a future under Chinese Communist Party (CCP) rule, as the population shrinks, young people face high unemployment, local governments grapple with trillions of dollars of debt, and property developers face insolvency amid millions of unsold properties. Meanwhile, the CCP is showing increasing hostility to foreign market participants, which has led to plunging foreign direct investment as companies move their money and employees out of China.

Yet none of this indicates that Beijing lacks the wherewithal to continue threatening U.S. and allied interests. With an $18 trillion economy at its disposal, the CCP has plenty of resources to fuel its military and technology ambitions, even at low levels of GDP growth. Lackluster prospects in other sectors and an ambition to excel in advanced technology industries have led the PRC to redouble its investments in manufacturing, including in technologies SCSP has identified as battlegrounds.

What does this mean for the United States and other democratic market economies? The CCP is setting the conditions for high-tech trade wars in 2024: As the U.S. and EU attempt to rebuild their advanced manufacturing capacity, the PRC is producing far more than it can consume domestically – and is poised to dump the excess production on world markets.

5. The Innovation Flywheel Will Accelerate Across Strategic Tech Sectors Amid a Year of Geopolitical Uncertainty:

If 2023 was the year of generative AI, 2024 will be the year of AI-enabled innovation. As a new interface for software, GenAI has set off a flywheel that is driving advances in AI itself, converging with other tech sectors, including each of the six technology battlegrounds — advanced networks, microelectronics and advanced compute, biotechnology, energy, and advanced manufacturing, and will ultimately accelerate and transform the very process of innovation. Next year, these early turns of the flywheel will spin into more concrete forms of Innovation Power. Governments and industry alike will be put to the test as the pace of innovation accelerates and nations compete to capitalize on the fast-evolving technologies changing our world. Technological, geopolitical, and economic advantage will accrue to the nation(s) best able to organize their ecosystems for this era of converging general purpose technologies.



Over the course of the year, SCSP published three national action plans teeing up proposals for bold and ambitious government-led moonshots, girded by key policy recommendations.

- In the world of biotechnology, the White House published its Bold Goals for U.S. Biotechnology and Manufacturing and launched the Office of Pandemic Preparedness and Response Policy, while the National Security Commission on Emerging Biotechnology capped off its first year. To build on this laudable work, SCSP published its National Action Plan for U.S. Leadership in Biotechnology, which offered three moonshots that would help convert the United States' current edge in biotechnology into long-term leadership.

- As the United States continues its efforts to build connectivity across society and industry, the White House published its first ever national spectrum strategy, a recommendation urged in SCSP's National Action Plan for U.S. Leadership in Advanced Networks.

- Semiconductors have also continued their day in the sun, with the launch of the NSTC, continued rollout of CHIPS & Science funding, and the chips industry's ambitious effort to build three fabs in the United States. Taking a long view, SCSP published a National Action Plan for U.S. Advantage in Advanced Compute and

Microelectronics that offers recommendations for how to ensure the United States dominates the post-Moore's law future.

In 2024, SCSP will take on two of its last identified battleground technology sectors - next-generation energy technology and advanced manufacturing; these two industries represent a confluence of technologies and stakeholders that carry profound implications for a nation's innovation power. Parallel to our development of a National Action Plan for U.S. Leadership in Next-Generation Energy Technology, SCSP will convene a Commission for the Scaling of Fusion Energy, to help begin reorienting a decades-old scientific mission around burgeoning commercial fusion competition. The year-long effort will bring together stakeholders from industry, government, and academia to help accelerate the innovation coming out of the still nascent fusion breakthroughs.

In China, the Chinese Communist Party's Central Economic Work Conference in December underscored the important role that technology innovation will play in charting the country's path toward future economic and productivity growth in 2024. During the two-day meeting, senior CCP officials underscored how AI and other emerging technology sectors – including biomanufacturing, the digital economy, and quantum computing – will be critical in spawning new innovation and industries, setting the stage for an even heavier Party hand in the nation's technology and industrial policy.

6. The United States Will Build Upon AI Governance Efforts:

This year, we witnessed a significant shift towards AI governance, with multiple nations and entities taking substantial steps forward. The Biden Administration's Executive Order on Safe, Secure, and Trustworthy Artificial Intelligence is a broad and ambitious effort to govern AI development and use, particularly within the U.S. government. This order, alongside the Office of Management and Budget's draft guidance for Agency use of AI, underscored the government's commitment to ensuring that AI development aligns with democratic values and secure standards so that we can harness the tremendous benefits AI offers. Furthermore, the EU's long-anticipated Artificial Intelligence Act and the UK AI Safety Summit, resulting in the Bletchley Park Declaration signed by 29 countries, were landmark events. The Hiroshima Process International Code of Conduct for Advanced AI Systems is yet another international document that recommends risk based guidance for companies to adopt. These initiatives demonstrated a growing international consensus on the need for robust AI governance frameworks.

In addition to nations laying out their AI governance approaches, the year was punctuated by public and private partnerships. We saw an unprecedented level of collaboration between governments, international organizations, and the private sector in governing AI. In a groundbreaking move, the White House secured voluntary commitments from 7 leading AI companies, followed by a second round of 8 additional commitments.

The focus for 2024 must be building on these initial efforts. The domestic initiatives and commitments made this year are a step towards more structured legal frameworks for AI. We cannot risk the international or domestic AI governance landscape getting fragmented such that the effectiveness of these policies and approaches hinder the harmonious global and domestic development of AI technologies. By observing and learning from these diverse efforts, we can identify best practices and areas needing legal fortification. This approach exemplifies a fundamental strength of the United States: the capacity to understand and adapt before imposing and enforcing legal regimes. The U.S. needs practical, intuitive tools that regulators can apply to determine which AI systems or classes of systems warrant their regulatory efforts because we cannot and should not regulate every AI system. This is why the SCSP, in collaboration with Johns Hopkins University - Applied Physics Labs, released the Framework for Identifying Highly Consequential AI Use Cases. This framework guides the assessment of the often interrelated harmful and beneficial impacts of AI systems on society so that regulators can classify systems as highly consequential to society. From an international perspective, we need to continue to foster a collaborative approach to understanding the capabilities of AI and coalescing around shared concerns and risks.
