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General Comment

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Attachments

TechNet Comment Docket No. NSF-2025-OGC-0001



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Re: TechNet Comments on the Development of a 2025 National Artificial Intelligence (AI) Research and Development (R&D) Strategic Plan [Docket No. NSF-2025-OGC-0001]

To Whom It May Concern:

TechNet appreciates the opportunity to comment on the White House Office of Science and Technology Policy's (OSTP) request for information on the development of an updated *National Artificial Intelligence (AI) Research and Development (R&D) Strategic Plan*. Many of our nation's leading AI developers, deployers, researchers, and users are TechNet members.

TechNet is the national, bipartisan network of technology CEOs and senior executives that promotes the growth of the innovation economy by advocating a targeted policy agenda at the federal and 50-state level. TechNet's diverse membership includes dynamic American businesses ranging from startups to the most iconic companies on the planet and represents five million employees and countless customers in the fields of information technology, artificial intelligence, e-commerce, the sharing and gig economies, advanced energy, transportation, cybersecurity, venture capital, and finance.

R&D serves as the backbone for innovation, enabling the discovery of new algorithms, models, and technologies that enhance AI capabilities and ensure the United States remains the global leader in the development and deployment of AI. Yet, China has overtaken America in public sector R&D investments, particularly considering recent cuts to federal science and technology programs. In three key categories of R&D that contribute to gross domestic expenditures on R&D, U.S. spending growth is now only a fraction of China's, and total Chinese R&D expenditure is 1.6 times that of the United States according to the latest data from the Organization for Economic Cooperation and Development (OECD).¹ This is not surprising: in 2017, China released its New Generation

¹ Main Science and Technology Indicators (MSTI) database, Organization for Economic Cooperation and Development. [https://data-explorer.oecd.org/vis?df\[ds\]=dsDisseminateFinalDMZ&df\[id\]=DSD_MSTI%40DF_MSTI&df\[ag\]=OECD.STI.STP&vw=tb&dq=.A.G%2BT_RS...&lom=LASTNPERIODS&lo=5&to\[TIME_PERIOD\]=false](https://data-explorer.oecd.org/vis?df[ds]=dsDisseminateFinalDMZ&df[id]=DSD_MSTI%40DF_MSTI&df[ag]=OECD.STI.STP&vw=tb&dq=.A.G%2BT_RS...&lom=LASTNPERIODS&lo=5&to[TIME_PERIOD]=false) Accessed on May 15, 2025.

Artificial Intelligence Development Plan, in which it committed “to build first-mover advantage” in its competition with America.²

This gap is likely to grow with China continuing to surge its public investments in R&D. China’s 2025 central budget allocated \$55 billion USD for science and technology research alone, with a strong focus on national R&D efforts to support fundamental research in AI and technological innovation. More concerning, the United States is not attempting to catch up to China. From 2019 to 2023, U.S. year-over-year growth in government expenditures in R&D declined and was negative in some years. While American industry continues to invest in R&D and fuel innovation, they cannot cover the delta alone. In fact, the role of federal investment in catalyzing private sector investment cannot be overstated with even small federal investments signaling national priorities able to mobilize enormous private sector investments. Updating the *National Artificial Intelligence (AI) Research and Development (R&D) Strategic Plan* is an important step forward, and the United States must reaffirm its leadership by committing the resources necessary to stay at the forefront of technological innovation.

While industry naturally focuses on near-term applications with immediate returns, the government is uniquely positioned to invest in long-term, high-risk, high-reward research that serves broader public and national interests. This comment outlines key areas where federal AI R&D investments should be prioritized and strengthened to accelerate AI-driven innovation, enhance U.S. economic and national security, promote human flourishing, and maintain U.S. dominance in AI.

Increase Federal Investment in Basic Research, R&D, and Workforce Development

America has long been the global leader in foundational technology research and development. AI tools can enhance scientific research to reach insights and results within hours instead of months or years, helping us to achieve scientific breakthroughs that will define the next generation. As nations like China work to outcompete America in AI and emerging technologies, it is critical that we strengthen our investments not only in AI R&D but also basic research and the broader scientific ecosystem. This includes funding national research infrastructure to provide AI researchers and students with greater access to complex resources, data, and tools needed to develop AI. It also requires robust funding for programs such as the Department of Commerce’s Economic Development Administration’s Regional Innovation and Technology Hubs Program, the National Institute of Standards and Technology’s (NIST) laboratories, and the Department of Energy’s Office of Science, which will ensure innovation, workforce development, and economic development are catalyzed and spread throughout the entire country. In addition to strengthening domestic AI research and development, the government should work with trusted partners to foster stronger international AI research collaborations that will help the U.S. maintain its competitive edge while ensuring that AI ecosystems remain anchored in the United States.

² <https://digichina.stanford.edu/work/full-translation-chinas-new-generation-artificial-intelligence-development-plan-2017/>

For the United States to remain the global leader in AI, we must also strengthen our domestic science, technology, engineering, and mathematics (STEM) talent pipeline. According to the House China Select Committee, the Chinese Communist Party has invested heavily in STEM education and is producing more research on AI and as many as five times the number of STEM graduates as the U.S. American students and adults need high-quality, widely accessible STEM and workforce education and training programs at all levels to give them the tools they need to succeed. Federal, state, and private investments in computer science, core STEM competencies, and related programs from early childhood through high school and beyond will produce immense returns for American technological innovation.

The National AI Research Resource (NAIRR) developed materials to support educators to ensure that they have readily available options for incorporating AI tools and training materials that support student learning in AI. We encourage the administration to utilize these best practices and continue to invest in the development of educational materials that will allow students to gain new and early exposure to AI tools and methodologies that transform their understanding; increase their interest in AI and other STEM fields; and broaden engagement across the full pool of talent to build a strong and diverse future AI innovation ecosystem. The NAIRR is best placed to increase the competitiveness of American entrepreneurs and startups and empower smaller public universities and community colleges by providing the necessary hands-on training for students to succeed in our rapidly changing economy. It addresses challenges associated with the high cost of, and limited access to, computing resources and high-quality data for new researchers and students. By providing a broader foundation for research and skills training, American companies can then take advantage of the broader knowledge base. Many TechNet members are already providing upskilling opportunities for individuals looking to enter the technology economy. These upskilling opportunities can be further enhanced by leveraging publicly available resources, such as online courses, industry certifications, and government-sponsored training initiatives, to create tailored learning pathways that address specific skill gaps and foster employee growth.

Foster International Collaboration in AI R&D

The U.S. government is best placed to initiate and support international partnerships with other nations, universities, and private sectors and facilitate the global exchange of ideas. By negotiating and leading bilateral and multilateral agreements focused on AI research, the government can foster collaboration that encourages shared resources, knowledge, and expertise. This includes leading joint research projects, funding opportunities, and knowledge-sharing workshops, and it may involve grants for research initiatives that include international partners or funding for conferences and symposiums that bring together global AI researchers. Such financial support can help break down barriers to collaboration and encourage diverse participation.

The government should also look to support talent mobility. Facilitating the movement of researchers and professionals across borders can enrich the AI R&D landscape. Programs that provide visas for researchers, scholars, and AI professionals can help attract global talent to the U.S. and allow American researchers to gain critical international

experience. This cross-pollination of ideas can lead to innovative solutions and advancements in AI technologies.

Ultimately, by participating in international R&D initiatives and promoting innovation-friendly platforms where researchers can share their findings and data, the government will be better positioned to advocate for frameworks and policies that support American companies and level the playing field. This will not only accelerate innovation but also ensure that the U.S. remains at the forefront of AI advancements in a rapidly evolving global landscape.

Focus on Foundational AI Research, Next-Generation Hardware, and Computational Infrastructure

A core priority for federal R&D must be investment in fundamental advances in AI algorithms, architectures, mathematical foundations, and computing paradigms. These are the building blocks of future AI systems and may not have immediate commercial applications, making them less attractive for private-sector funding. Prioritizing research in these areas is essential for pushing the boundaries of what AI can do and ensuring long-term U.S. AI leadership. This includes exploring novel approaches beyond current dominant paradigms like deep learning, fostering breakthroughs that could lead to entirely new classes of AI capabilities.

Additionally, advances in AI are intrinsically linked to the underlying hardware and computational infrastructure. Federal R&D should prioritize research into next-generation AI hardware and architectures that can support more complex, efficient, and powerful AI systems. This goes beyond current hardware optimized for deep learning and explores novel computing paradigms that can enable significant leaps in AI performance and capabilities. Creating national testbeds where researchers can access and experiment with cutting-edge hardware and providing access to large-scale datasets will be particularly crucial for enabling researchers to pursue ambitious AI projects and accelerate progress.

Developing entirely new computing paradigms or processor designs requires significant, sustained investment over many years with no guarantee of immediate commercial return. Industry, driven by market demands and quarterly results, naturally prioritizes R&D with clearer paths to commercialization and profitability. While companies are crucial for developing and manufacturing current and near-term hardware, they are less inclined to fund speculative research into technologies that may not yield products for a decade or more. The government, however, can better support foundational research in public universities and national labs, build shared testbed infrastructure, and convene collaborations across the ecosystem that focus on national interest and long-term economic competitiveness. These kinds of long-term and strategic capital investments are essential for pushing the boundaries of computing beyond incremental improvements, laying the groundwork for future AI capabilities that may support national security but may not have direct commercial value.

Invest in AI Research with High Reward Potential for Future Competitiveness

The federal government should champion AI research with high reward potential that reduces security risks and accelerates the commercialization of emerging technologies for future U.S. competitiveness. Truly transformative breakthroughs often emerge from fundamental research with uncertain — and sometimes improbable — outcomes and long timelines. These moonshot projects are often too speculative for private sector investment, especially by small-to-medium sized companies and start-ups. By funding these ambitious endeavors, the government can push the boundaries of what is possible in AI. This includes exploring new neural network models, developing systems capable of complex scientific discovery like designing novel proteins or discovering new physics, creating entirely new AI architectures inspired by biological systems, or building AI capable of navigating and understanding highly complex, unstructured environments. It could also include research into advanced human-AI interaction, exploring how humans and AI systems can collaborate more effectively and intuitively. Such research is vital for developing AI that augments human capabilities and productivity across various sectors. Finally, research into agentic and physically embodied AI, which involves AI systems that can act autonomously in the physical world, also holds significant strategic competitiveness implications. Federal R&D in this area can drive advancements in robotics, autonomous vehicles, and other physical systems powered by AI, impacting industries from manufacturing to logistics and defense.

Advance AI for National Security and Critical Infrastructure

National security and the resilience of critical infrastructure are areas where government leadership in AI R&D is indispensable. This often requires access to realistic and sensitive environments and data that only the government can provide and curate securely. Developing AI for detecting sophisticated cyberattacks on critical infrastructure, for instance, requires access to real-world attack data, network configurations, and vulnerability information that is highly restricted and cannot be shared with the private sector at large due to security risks. Similarly, R&D for defense applications often requires access to secure facilities, classified hardware, and operational data from military exercises or deployments. Private companies, even those with security clearances, operate under different constraints and cannot replicate this level of secure access necessary for developing and testing truly robust AI applications for national security.

Additionally, the government holds deep, often classified, knowledge about specific threats, adversary capabilities, strategic priorities, and the nuances of national security operations. This goes beyond technical knowledge and includes nuanced geopolitical context, intelligence analysis, and understanding of complex command-and-control structures. Developing AI that can effectively support military decision-making or analyze intelligence requires integrating this specific, often non-public, domain expertise. Private sector knowledge is typically focused on commercial markets and general technical challenges, lacking the specific, sensitive context vital for national security applications.

The government also has the unique capability to convene and sustain large-scale, long-term R&D efforts that may not have a clear commercial return on investment but are critical for national security. This includes funding high-risk, foundational research with decades-long timelines, building and maintaining specialized testing infrastructure (like secure ranges for autonomous systems or isolated networks for cyber defense simulations), and possessing the regulatory authority necessary to set standards and ensure compliance for critical systems. While the private sector excels at rapid innovation for commercial markets, the scale, security requirements, and non-commercial nature of much national security R&D necessitate government leadership and investment. This is particularly true for the application of AI in cyberspace operations — a rapidly evolving field with significant implications for national security and economic stability. Federal R&D should prioritize advancements in AI for detecting and responding to cyber threats, enhancing network defenses, and supporting offensive and defensive cyberspace operations, especially in areas beyond typical commercial applications.

To complement federal R&D investment in national security and critical infrastructure, the federal government should ease procurement processes for federal agencies seeking to adopt AI technologies, particularly in related sectors such as transportation and logistics. By streamlining these procedures and making the procurement process easier and more efficient, agencies will be able to take better advantage of federal investments in this space, respond more quickly to emerging challenges, and leverage cutting-edge AI tools that will only help further AI's development and deployment. This includes efforts like adopting flexible contracting vehicles (such as Blanket Purchase Agreements or modular "AI Fast-Track" pilots) and expanding the range of pre-approved, FedRAMP-authorized platforms. At the same time, the government should mandate a data-forward approach to internal operations, ensuring that decisions are informed by comprehensive analysis and robust evidence. This dual approach will not only drive modernization and enhance service delivery across the government, but also support research efforts by testing AI systems in the national security and defense space in ways only accessible to the government. This will further ensure that federal AI R&D investments deliver measurable value for government and the public alike.

Address the Impact of AI on the American Workforce

Over the past decade, AI technology has become increasingly integrated into the U.S. economy and the daily lives of Americans. One of the most consequential topics associated with recent advancements in AI technology is how and to what extent AI tools will affect the workforce, the nature of work, and existing jobs. Federal R&D should include research on AI systems and educational approaches that support American workers, facilitate workforce adaptation to AI-driven changes, and improve overall workforce productivity. This includes developing AI-powered training tools, understanding the impact of AI on different job sectors, and exploring how AI can create new economic opportunities.

Without strong and readily-available STEM education, technical training, and upskilling opportunities, many workers may be unable to attain the digital skills they need to take

advantage of AI-driven job opportunities or pursue careers in in-demand STEM fields. Greater government investments in upskilling, reskilling, and training programs and pathways are imperative to ensuring that all American students and workers can realize the benefits of AI and succeed in a global, interconnected, and technology-driven economy. Efforts to increase equitable access to digital skills training across occupations and expand online skills and workforce training programs for underserved and underrepresented communities are also critical to mitigating potential job displacements and providing all U.S. workers with the ability to adapt and advance their careers as jobs evolve. These programs have the potential to unlock new AI-related job opportunities for workers while also boosting U.S. global competitiveness and national security.

Conclusion

Federal spending in R&D continues to catalyze private sector investment and innovation. For example, many of the most influential private-sector and academic research papers that spurred private sector AI large language model (LLM) development in recent years rely heavily on government-supported research. The unique and indispensable role the U.S. government plays in driving innovation, ensuring national security, and promoting the well-being of its citizens will only become more critical in the age of artificial intelligence. Strategic federal investments in R&D will be essential for the continuing development and deployment of AI, paving the way for groundbreaking solutions that can significantly improve products and services across industries and improve citizens' daily lives. Translating these R&D priorities into tangible advancements will require continued collaboration between government, academia, and industry, and we remain eager to partner with the administration in fostering innovation and advancing America's global AI dominance.

Sincerely,

Linda Moore
President and CEO
TechNet

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