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INDUS-X at One: A Year of Bilateral Breakthroughs

KEY TAKEAWAYS

- The U.S. and India seek to deter China and preserve regional stability.
- INDUS-X emerged amid deepening strategic ties, mutual threat assessments, and institutional evolutions.
- Since its launch, bilateral defense technology investment, research and industrial partnerships have expanded.

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By: Sameer P. Lalwani, Ph.D.; Vikram J. Singh



Amid warming bilateral ties, India and the United States have steadily built their defense relationship over 20 years. More recently, shared concern over China's rise and projection of power has motivated a renewed focus on institutionalizing the relationship at the highest levels while building the connective tissue necessary to innovate and collaborate effectively in support of preserving a free and open Indo-Pacific region. Announced during Prime Minister Modi's 2023 visit to the United States, the [India-U.S. Defense Accelerator Ecosystem](#), or INDUS-X, strives to enhance both countries' defense technological capabilities to balance China in the Indo-Pacific. As U.S.-India ties continue to deepen, it may also gradually reduce India's reliance on Russian hardware.

INDUS-X aims to "expand the strategic technology partnership and defense industrial cooperation" by deepening commercial ties across U.S. and Indian defense industries. The effort seeks to meet India's decades-long interest in defense technology cooperation with the United States while advancing the Pentagon's aspiration for integrated deterrence by leveraging Indian defense capabilities, diversifying supply chains and fostering collaboration between the public and private enterprise of both countries.

While the [significant](#) growth in U.S.-India defense ties — bolstered by bipartisan support across five administrations — opened the door to major strategic realignment, expanded trust, and spurred a wave of defense cooperation initiatives, the early [efforts](#) toward co-development and co-production struggled to overcome commercial and bureaucratic headwinds. Nevertheless, these early initiatives helped make both countries' defense ecosystems more legible to one another and laid the groundwork for today's deepening collaboration.

More recently, a shared and acute threat assessment of an increasingly powerful and coercive China led both countries to re-energize cooperation to secure a free and open Indo-Pacific. The institutional evolution of new defense offices in both countries — the U.S. [Defense Innovation Unit](#) (DIU) and India's Innovations for Defense Excellence (iDEX) — additionally brought resources and attention to critical and emerging technologies to help their respective militaries [modernize at the speed of innovation](#).

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INDUS-X emerged from — and owes much of its success to — these growing strategic ties, mutual threat assessments and institutional evolutions. On the eve of the third INDUS-X summit, India and the U.S. have breakthroughs to celebrate and more to look forward to.

INDUS-X Progress

INDUS-X is comprised of three central mechanisms. First, the initiative addresses information asymmetries by plugging gaps on business opportunities and demystifying U.S. and Indian acquisition procedures for investors, policymakers and startups. Second, INDUS-X establishes cross-national, social and commercial networks to connect the right private investors or labs with startups or engineers. Finally, by connecting government to private enterprise, INDUS-X helps mitigate the regulatory friction associated with integrating defense knowledge, goods and services.

- **Info-sharing mechanisms.** Several initiatives have begun to solve information asymmetries through direct engagement with industry, startups, academia, investors and government. The launch of the U.S.-India Initiative on [Critical and Emerging Technologies](#) (iCET) in January 2023, with INDUS-X following in June 2023 as the defense component of iCET, catalyzed government efforts to bridge information gaps.

In the past year, iDEX and DIU's National Security Innovation Network jointly launched the INDUS-X [Gurukul education series](#) designed to help U.S. and Indian defense startups engage with experts on topics such as harnessing private capital for defense innovation, navigating regulations and export controls, and diversifying defense supply chains.

Meanwhile, [nongovernment stakeholders have supported](#) the INDUS-X collaboration agenda by organizing INDUS-X summits and startup expos, and convening [workshops](#) and sideline meetings focused on identifying knowledge gaps between the public and private sectors, [understanding best practices](#) for working in each country's defense ecosystem, and highlighting investment opportunities in the [Defense Industrial Cooperation roadmap](#).

Beyond working-level engagements, the Indian Defense Ministry and U.S. Defense Department began to evaluate progress and priorities through regular higher-level meetings of the Senior Advisory Group and through direct engagement with industry to get candid feedback, ideas and guidance.

- **Network-building mechanisms.** The launch of iCET and INDUS-X helped to deliver cross-national industrial collaboration, and new partnerships are likely to be forged with novel network-building efforts like the joint challenge programs and [INDUSWERX](#) testing range consortium, which makes it possible for Indian companies and research institutions to access U.S. testbeds and vice versa.

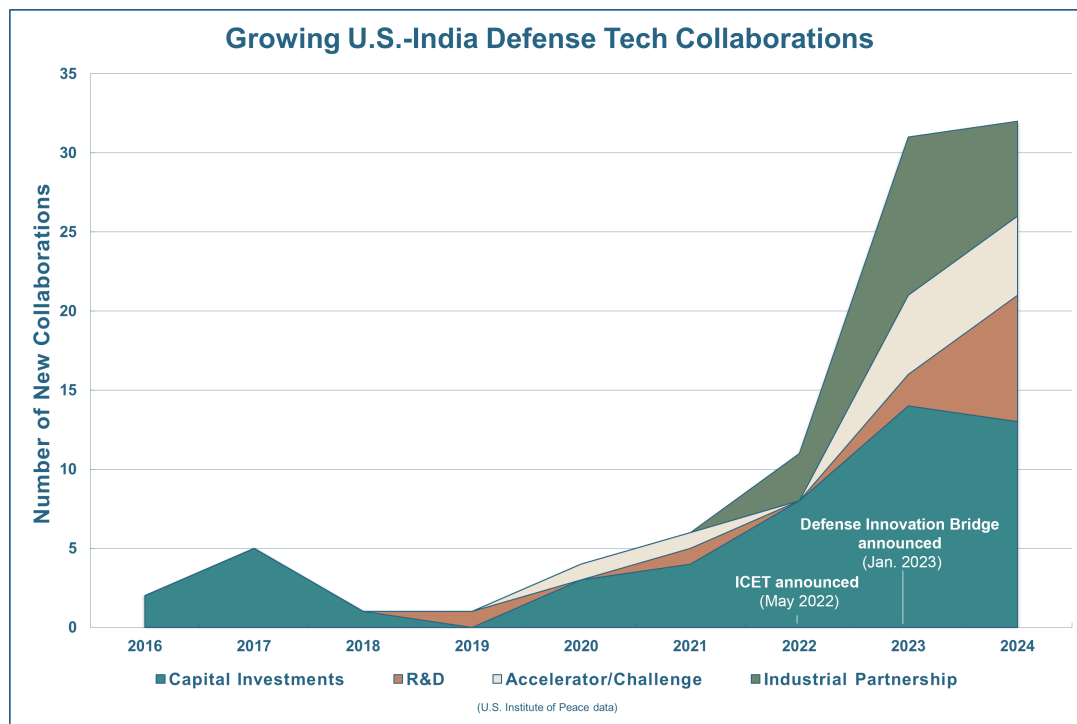
In the past six months, the consortium has brokered two pathfinder partnerships that will define the way forward for future partners. Texas A&M's Bush Combat Development Complex has become a testing partner for [Astrome's](#) novel 5G networks communications technology valuable in battlefield settings and Penn State is working with [NewSpace](#) on developing drone swarms for humanitarian assistance and disaster relief. The already robust ecosystem of joint exercises and training are also now being used to conduct field trials of systems that are candidates for co-development or coproduction under INDUS-X. This is complemented by INDUS-X initiatives that link academia with government and industry to support readiness in [critical emerging sectors](#), such as space domain awareness and electronic warfare.

Joint challenges exemplify INDUS-X's use of public-private partnerships to form commercial links critical to technologies procured by both countries. DIU and iDEX, for instance, awarded \$1.2 million to several Indian and American start-ups and organizations to create commercial technology solutions for maritime intelligence, surveillance, and reconnaissance (ISR) and underseas communications. Applications opened for two new joint challenges focused on space-based ISR are being announced.

- **Mitigating regulatory friction.** Like its parent iCET, INDUS-X has functioned as a sort of helpline for projects that are of strategic import to the U.S. and India. The 2023 [defense industrial roadmap](#) has helped guide industry and regulators toward optimal spaces for cross-national collaboration.

The pace of regulatory adaptation has seen noticeable improvement. U.S. officials report over 99% approval for partner export licenses with average decision time of 45 days or less. Anecdotal accounts from U.S. and Indian companies working in the maritime and space domains suggest they have been pleasantly surprised by the speed of approvals. U.S. government offices and services that see opportunities for an innovation edge can be natural allies of startups in this process. One Indian space startup observed that "[the] U.S. Space Force moved heaven and earth for us to be a part of the ecosystems we've been trying to enter."

INDUS-X and iCET have had a discernible effect on the rate and diversity of U.S.-India defense technology collaborations, particularly involving the private sector. Data collected from public sources — while no means comprehensive — suggests modest collaboration from eight years ago has seen a steep rise, largely following the launch iCET and INDUS-X.



Mouse-over the graph to view its description.

The types of collaborations have also diversified beyond venture capital to encompass a range of cooperative research and development agreements and industrial partnerships, and earlier ventures are beginning to thrive. Public sector collaborations like the jointly developed [air-launched drone program](#) have crossed several milestones including a demonstration at Eglin Air Force Base in Florida this June and another demonstration planned for an Indian military testing range later this year. The [partnership](#) between Microsoft and the Indian Space Research Organization launched in January 2023 is poised to support the next wave of Indian space startups. And a new [accelerator](#) launched by FedTech and Indusbridge Ventures seeks to support Indian dual-use tech companies' entry the U.S. market.

INDUS-X's Deterrence Value

Washington and New Delhi hold a shared view that India should be able to stand up to and deter China to preserve stability in its neighborhood. As INDUS-X moves past its launch phase, the byproducts of U.S.-India academic and commercial collaboration are starting to have meaningful effects on such national security challenges.

Some partnerships offer critical potential for improved maritime reconnaissance and domain awareness. General Atomics' collaborations with Indian startups for [new chip and sensor designs](#) and for [targeting algorithms](#) will help India's soon to be acquired MQ-9B predator drones work effectively with U.S. and partner maritime reconnaissance platforms to defend freedom of navigation in the Indian Ocean. As India strives for maritime security in its neighborhood, a partnership between Liquid Robotics and Sagar Defence promises to equip India with a long-endurance unmanned system to support maritime and underwater domain awareness.

Meanwhile, Skydio's collaboration with India's Aeroarc will help to compete with China's [dominance](#) of the global drone market, where Chinese dominance is enabling the People's Liberation Army (PLA) to harvest critical data and even [pre-position cyber-attacks](#).

Looking forward, the [planned tests](#) this September of the Stryker infantry combat vehicle and Javelin anti-tank missile on the India-China border may result in a joint production deals that not only stimulate India's ecosystem of defense technology and suppliers, but also enhances Indian defense capabilities to deter PLA aggression. Such initiatives may also help reduce India's dependence on some Russian weapons, for example by eventually replacing its Soviet-origin BMP-2 vehicles and Konkur missiles.

Even INDUSWERX collaborations between U.S. university labs and Indian startups can enhance deterrence including a potential partnership to develop 5G technologies to equip the Indian Army with flexible, secure battlefield communications in the mountainous terrain of the disputed border with China.

Broader Geopolitical Progress

The INDUS-X Summit coinciding with the beginning of the U.S. and India's [largest-ever joint military exercise](#) in Rajasthan offers a powerful demonstration of the deepening bilateral defense collaboration. India has [matched](#) deepening defense technology cooperation with greater operational cooperation including burden sharing, integrated deterrence efforts, and politically and militarily balancing China, even outside its theater.

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First, India has taken on new burden-sharing responsibilities. In November 2023, India became a full member of the [Combined Maritime Forces](#) naval coalition, conducting joint constabulary operations focused on maritime security under a multinational command. India also supported the creation of the Indo-Pacific Partnership for Maritime Domain Awareness (IPMDA) under the Quad (Australia, India, Japan and the U.S.) to provide visibility on dark shipping such as trafficking, terrorism, sanctions evasions or other illicit activity. India is poised to [operationalize](#) the South Asia leg of IPMDA this fall by completing a [contract with HE360](#) to bring remote radio frequency sensing to the region.

Meanwhile, the growing tempo and complexity of U.S.-India military exercises advances integrated deterrence in the Indo-Pacific. By our count, over the past two years the U.S. and India have averaged 16 exercises (including nine bilateral) per year—over a threefold increase since 2018. These include exercises with

Quad countries such as the Malabar exercise and lesser-known annual anti-submarine warfare exercise, [Sea Dragon](#), which India first joined in 2021. In March 2024, the U.S. and India returned to the [tri-service](#) Tiger Triumph. The U.S. is the only country other than Russia to conduct a tri-service exercise with India (Russia's last was in [December 2019](#)). The Indian and U.S. air forces have also expanded exercises, with the U.S. Air Force also conducting the first bilateral exercise over Indian airspace that included a B-1 bomber in 2023 and then the Indian Air Force returning to the U.S. [Red Flag exercise](#) in June 2024 for the first time in eight years.

Finally, we see India balancing China, not only in its own neighborhood, but also in the Pacific. After Beijing's aggressive military exercises following the U.S. Speaker Nancy Pelosi's visit to Taiwan in 2022, India, for the first time, publicly [criticized](#) Beijing for "the militarization of the Taiwan Strait." The next summer, [reports](#) surfaced that three former military service chiefs had all attended a Taiwan Foreign Ministry forum, and the Indian chief of defense staff had requested a [study](#) of Indian options in a Taiwan contingency.

India's assertiveness has extended to the South China Sea. India conducted a [joint naval exercise with the Association of Southeast Asian Nations](#) in May 2023. That June, it [revised its stance](#) from neutrality to moving in favor of the 2016 Permanent Court of Arbitration ruling that backed the Philippines' claims in its dispute versus China in the South China Sea. In May 2024, India sent a flotilla of three ships to make a [port call](#) to Manila to bolster the U.S. ally amid increasing maritime tensions with China, just a month after the first delivery of Indian BrahMos missiles to the Philippines, which has not evaded [China's notice](#).

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The U.S.-India defense technology partnership has developed from aspirations to institutions. India's geopolitical contributions to a free and open Indo-Pacific have also grown more substantive, whether shouldering greater operational security burdens, accelerating the pace and scope of military exercises with the U.S., or standing up to Chinese coercion.

What's Next?

Going forward, INDUS-X's durability and growth will depend on its institutionalization and achievements. The institutional foundations of INDUS-X appear to be sound as DIU and iDEX have taken ownership over the initiative, upgraded their memorandum of understanding, launched official webpages for INDUS-X, and released new framework for the INDUSWERX testing consortium.

What will further solidify and add substance to these commitments is if the pathfinder projects of INDUS-X result in wins. The more significant demonstration of trust is going beyond signed agreements to sourcing innovations from one another through this initiative.

The conclusion of the General Atomics sale of the MQ-9B that will source from several Indian companies for subsystems and sustainment, and from startups for sensors, and microchips, will provide a visible template for other prime defense contractors. As the industrial partnerships between Liquid Robotics and Sagar Defence, and between Skydio and Aeroarc start to secure orders and deliver products to customers, other companies are more likely to follow suit and pursue their own teaming agreements. Similarly, follow-on and cross-national procurements from joint challenge winners will demonstrate INDUS-X as a viable pipeline to operational utility and commercial success. Large acquisition plans can also be married with joint challenges like tethering co-production of the Stryker to joint challenges that source from Indian ecosystem to equip it with indigenous subsystems.

Both countries will need to create more tools and resources to facilitate scouting and showcasing talent and innovation within each others' defense ecosystems. [Previously proposed ideas](#) like joint investment funds and talent flow through academic exchanges and fellowships are worth pursuing.

There is interest within the U.S. government in obtaining dedicated pools of funds to better pursue engagement, exploration, scouting and matchmaking at Indian academic institutions, labs and companies for new capabilities and innovations. These could reveal opportunities for research collaboration, co-development and testing, or procurement of commercial products (e.g., for domain awareness) off the shelf or as a service. The U.S. can also widen the door to Indian defense innovators by opening up more types of challenge competitions that may involve controlled unclassified information. This might facilitate more commercial handshakes by sending clear signals to industry that doing business with Indian defense providers is not only permitted but encouraged.

On the Indian side, there needs to be a more coordinated effort led by the government to bring Indian companies to the target-rich environments where they can showcase their innovations. Several U.S. companies have observed that they don't have great visibility on who their potential partners might be in the emerging Indian defense ecosystem. Some Indian startups have noted the need to refine their product for markets beyond India. In particular, if Indian companies want to do more business in the U.S. market, it would be helpful for the Indian Ministry of Defence to identify and set up Indian pavilions at the top defense or dual-use mainstream expos in the U.S. that may include [Sea Air Space](#), [AUVSI](#), [Emerging Technologies for Defense](#), and [AUSA](#).

Coproducing defense capabilities will accompany coproducing security. With greater institutionalization, scouting, and showcasing, INDUS-X will be poised for many more years of breakthroughs and success.

PHOTO: Indian service members and U.S. marines and sailors stand together in formation during the opening ceremony of Exercise Tiger TRIUMPH in Visakhapatnam, India, March 19, 2024. (U.S. Marine Corps photo by Cpl. Aidan Hekker)

The views expressed in this publication are those of the author(s).