Balancing Strategic Partnerships and Sovereignty
The Impact of Technology Transfer Concerns on India–US Defence Cooperation

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India–US defence cooperation has grown significantly, driven by shared interests in the Indo-Pacific region. However, technology transfer remains problematic due to India's focus on strategic autonomy and US concerns over intellectual property and export controls. This article investigates the same within the context of Defence Technology and Trade Initiative (DTTI), exploring how technology transfer concerns affect joint defence efforts and the development of advanced military system. It also examines US regulatory restrictions, such as International Traffic in Arms Regulations (ITAR), and their impact on technology sharing.

Additionally, the article considers India's 'Make in India' and 'Atmanirbhar Bharat' initiatives, which sometimes conflict with US technology protection expectations. The article suggests solutions, including flexible bilateral agreements and enhanced trust-building, to balance strategic partnerships with national sovereignty, aiming to resolve technology transfer issues and maximise the potential of India–US defence collaboration in the Indo-Pacific region.

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Introduction

Overview of India–US Defence Cooperation

The defence cooperation between India and the United States reflects a complex and evolving partnership shaped by shared strategic interests and historical developments. Over the past two decades, this bilateral relationship has strengthened significantly, transitioning from a phase of cautious engagement to one marked by robust defence collaboration. This evolution has been driven primarily by mutual concerns over regional stability, particularly in the Indo-Pacific, and a shared interest in countering rising regional threats.[1]

A pivotal moment in this partnership came with the signing of the US–India Civil Nuclear Agreement in 2008, which laid the groundwork for broader defence cooperation by enhancing bilateral trust and strategic alignment. The agreement not only facilitated increased military and technological exchanges but also signalled a commitment to deeper collaboration. The establishment of the Defence Technology and Trade Initiative (DTTI) in 2012 further solidified this trajectory, aiming to promote co-development and co-production of advanced defence technologies.[2] This initiative exemplifies the growing depth of the partnership, focusing on collaborative projects such as the joint development of the Multi-Role Transport Aircraft (MRTA) and the Advanced Aircraft Carrier.

In recent years, the strategic alignment between India and the US has been reinforced by their mutual participation in regional security frameworks and exercises. The Quadrilateral Security Dialogue (Quad), involving India, the US, Japan and Australia, highlights their collective efforts to ensure a free and open Indo-Pacific. Joint military exercises, such as the Malabar naval exercises, and cooperation through defence agreements like the Logistics Exchange Memorandum of Agreement (LEMOA) and the Communications Compatibility and Security Agreement (COMCASA) underscore the growing interoperability and strategic integration between their forces.

Despite these advancements, the partnership faces challenges, particularly regarding technology transfer and defence procurement. For instance, the constraints imposed by the International Traffic in Arms Regulations (ITAR) on the transfer of sensitive technologies and intellectual property rights issues

have occasionally hindered the pace of joint projects. Additionally, India's emphasis on strategic autonomy and its desire to develop indigenous defence capabilities through initiatives like 'Make in India' and 'Atmanirbhar Bharat' sometimes conflict with US expectations with regard to technology protection and export control.

Overall, the India–US defence cooperation represents a dynamic and strategic alliance characterised by significant achievements and ongoing challenges. The partnership's evolution reflects a balance between leveraging mutual benefits and addressing the complexities inherent in international defence collaboration.[3]

Objectives and Scope of the Study

The objectives and scope of the study on India–US defence cooperation, specifically focusing on technology transfer concerns, are aimed at understanding the intricate dynamics that influence this bilateral relationship.[4] This research seeks to unravel how technology transfer issues impact the broader goals of defence collaboration between the two nations, particularly in the context of shared strategic interests and national security priorities.

At the core of this study is the objective to critically examine the underlying factors that shape technology transfer between India and the US.5 This includes analysing how differences in strategic priorities and regulatory frameworks affect the transfer of advanced defence technologies. For example, the United States' stringent export control laws, particularly the ITAR, often limit the transfer of sensitive technologies to India. This regulatory framework aims to safeguard US military technology from potential misuse but can also create obstacles for joint development projects. An instance of this is the delays and complications in the joint development of the Advanced Medium Combat Aircraft (AMCA) programme, where US technology transfer restrictions have impeded progress.

Another key objective of the study is to assess the impact of these technology transfer concerns on specific defence cooperation frameworks, such as DTTI. The DTTI was established to facilitate collaborative projects and co-production agreements, yet its effectiveness is often constrained by the limitations imposed by export controls and intellectual property protection. An example is the ongoing discussions around the transfer of technology for the MRTA project, where the US has been cautious about transferring critical components and technology due to concerns over intellectual property and strategic security.

The scope of the study includes a detailed analysis of how these technology transfer challenges align or conflict with India's domestic defence initiatives, such as 'Make in India' and 'Atmanirbhar Bharat'. These initiatives aim to bolster indigenous defence production and reduce dependence on foreign technology. However, they also come in conflict with US technology transfer policies, which prioritise safeguarding technological superiority. For instance, India's push for self-reliance in defence production often clashes with the US's reluctance to share advanced technologies that could potentially enhance India's independent defence capabilities while challenging the balance of technological power.

In addition, the study aims to explore potential solutions to these challenges by proposing more flexible bilateral agreements and enhanced trust-building measures. It will assess how reforms in policy or new models of technology-sharing could address the concerns of both nations, thereby facilitating a more productive and mutually beneficial defence partnership.

Overall, the objectives and scope of this article are designed to provide a comprehensive understanding of the complex interplay between technology transfer concerns and defence cooperation, offering insights into how these issues can be managed to enhance strategic collaboration between India and the US.

Technology Transfer Challenges

Divergence in Strategic Objectives

The divergence in strategic objectives between India and the US forms one of the central challenges to their defence cooperation, particularly in the realm of technology transfer. While both nations share common interests, such as ensuring stability in the Indo-Pacific and countering the rise of China, their broader strategic visions often differ in ways that complicate defence collaboration. These differences have tangible implications for both countries in terms of how they approach technology sharing and envisage the depth of military integration.

India's strategic objective is grounded in maintaining its non-aligned posture and ensuring strategic autonomy, which is a core principle of its foreign policy. Historically, India has avoided deep military alliances with any one power, preferring to diversify its defence relationships to avoid over-reliance on any single nation. Even as India has deepened ties with the US, it remains committed to maintaining autonomy in decision-making, especially concerning military actions. This strategic posture has made

India cautious about becoming too closely enmeshed in the US security framework, including its global network of defence agreements and military arrangements. For instance, India has engaged in military cooperation with Russia for decades, including purchasing advanced weapons systems like the S-400 missile defence system. This has raised concerns in Washington, where US policymakers have expressed reservations about sharing sensitive military technology with a country that also engages closely with US strategic rivals.

On the other hand, the United States operates within a strategic framework that prioritises the projection of military power globally and maintains technological superiority. Its defence cooperation initiatives are often structured around alliances like North Atlantic Treaty Organisation (NATO) or bilateral security agreements that create tight integration between the US and its partners. The US tends to expect a level of alignment from its defence partners, particularly concerning geopolitical issues and security commitments. This expectation is evident in its resistance to technology transfers that could, in the long run, empower India to act independently of US strategic interests. For instance, Washington has hesitated to provide India with critical technology for platforms such as fighter jets or naval systems, fearing that India's policy of non-alignment and diversified partnerships could result in this technology being used in ways that do not align with the US strategic goals.

A key example of this divergence in objectives is evident in the differing approaches to the Indo-Pacific strategy. While both India and the US are committed to countering Chinese assertiveness in the region, their methods and the extent of their involvement differ. As for the US, it seeks a more assertive military posture, emphasising alliances like the Quad and expecting active participation in joint military operations and freedom of navigation missions. India, while aligned with the US in principle, takes a more cautious stance, emphasising diplomatic and economic engagements over direct military confrontations. This restrianed approach of India affects how it views technology transfers; India prefers to build its indigenous capabilities to ensure it can respond to regional threats on its terms, while the US prefers closer operational ties that require more trust in shared technology.

These differing strategic approaches have also been apparent in specific defence technology projects. For example, while the US has been willing to engage in defence co-development initiatives, such as through the DTTI, it has remained cautious in sharing the most advanced technologies that could potentially erode its competitive edge or lead to independent Indian military capabilities that operate outside of the US strategic framework. This was

evident in discussions around the transfer of drone technology, where India sought advanced systems that would allow for greater autonomous defence capabilities, while the US was reluctant to provide systems without ensuring tight controls over their use.

The divergence in strategic objectives between India and the US remains a significant hurdle in fully realising the potential of their defence cooperation. While both nations recognise the value of their partnership, these differences complicate negotiations over technology transfers, with each side pursuing goals that reflect their distinct visions of national security and global engagement.

Intellectual Property and Export Control Concerns

Intellectual property and export control concerns form a significant barrier in India–US defence cooperation, particularly when it comes to the transfer of advanced military technologies. The United States, as a global leader in defence technology, places strict controls on the export of its high-tech defence systems and associated intellectual property (IP). This caution is largely motivated by fears of technology leakage, which could compromise US military advantages or allow sensitive technologies to be accessed by adversaries. These concerns are reflected in stringent regulatory frameworks, such as ITAR, which govern the export of defence-related technologies. For India, these regulations often complicate its ability to obtain and integrate advanced US defence technologies, even when such cooperation could bolster the security of both nations in shared strategic areas like the Indo-Pacific.[6]

One prominent example of how intellectual property and export controls affect defence collaboration is in the development of aircraft technologies. India has sought access to cutting-edge fighter jet technologies from the US, including the transfer of advanced avionics and engine systems. However, US regulations have often limited the depth of such cooperation.

For instance, India's interest in acquiring the technology behind the F-16 and F/A-18 fighter jets for its air force modernisation faced obstacles, as the US was reluctant to transfer critical technologies like radar and stealth capabilities without stringent safeguards. This restriction stems from concerns that India's non-aligned foreign policy and defence ties with countries like Russia could inadvertently expose these sensitive technologies to third parties, potentially undermining US strategic and commercial interests.

Another dimension of this issue is the reluctance of US defence firms to share intellectual property with Indian defence entities. Many US companies are hesitant to enter into co-development or co-production agreements with

Indian partners due to fears of inadequate IP protection in India. Despite improvements in India's IP laws, US defence firms often perceive the Indian legal system insufficient when it comes to protecting proprietary technology. This has slowed down collaboration in areas such as drone technology, advanced radar systems and missile defence. For example, US firms have been cautious about transferring critical drone technologies to India, particularly in the context of projects like the Predator drones, as concerns remain over how the technology will be safeguarded from potential misuse or theft.

India's defence policies, grounded in 'Make in India' and 'Atmanirbhar Bharat' initiatives, add another layer of complexity to these IP and export control concerns. These policies aim to increase indigenous defence production and reduce reliance on foreign suppliers, which, in turn, raises concerns in Washington about the possibility of IP being reverse-engineered or transferred to Indian state-owned defence companies. This tension is evident in negotiations surrounding the co-development of future weapons systems, where India seeks more control and autonomy over the production process, while US companies demand guarantees for the protection of their intellectual property. In several instances, such as the potential co-development of a new generation of aircraft carriers or missile defence systems, these issues have stalled progress, as both sides struggle to reconcile their conflicting priorities.

Furthermore, the export control system in the US, designed to protect critical defence technologies, has often proven to be a bureaucratic hurdle. The time-consuming process of obtaining the necessary export licenses has frustrated Indian defence procurement efforts, particularly in urgent or sensitive cases. For example, India's request for advanced surveillance and reconnaissance equipment during border tensions with China saw delays due to the lengthy approval process required under US export laws. Such delays can hinder India's ability to respond quickly to security threats, weakening the strategic advantage that defence cooperation with the US is intended to provide.

Intellectual property and export control concerns remain key sticking points in the India–US defence relationship. While both nations recognise the potential benefits of deeper technology-sharing and co-development initiatives, these concerns reflect deeper strategic and commercial considerations that complicate the realisation of this potential.

For India, the challenge lies in building trust and demonstrating that it can safeguard US technologies without compromising its strategic autonomy. For the US, balancing its desire to support India's defence modernisation with the need to protect its intellectual property and maintain control over its

most sensitive technologies is an ongoing dilemma. These issues will continue to shape the future of the India–US defence partnership, particularly as both countries navigate the increasingly complex global security environment.

Impact of ITAR on Technology Sharing

The International Traffic in Arms Regulations (ITAR) significantly impact the trajectory of technology sharing between India and the US, influencing the scope and depth of their defence cooperation. ITAR is a US regulatory framework that governs the export and import of defence-related articles and services. Its primary purpose is to ensure that sensitive military technologies do not fall into the hands of potential adversaries or third parties who could undermine US national security. While ITAR reflects the US' legitimate security concerns, it poses substantial challenges for countries like India, which are eager to access advanced defence technology but must navigate these restrictions.[7]

India's desire for high-end technology, particularly in areas such as fighter jets, missile systems and naval platforms, is often constrained by ITAR. For example, India's negotiations to procure armed drones, such as the Predator MQ-9 Reaper, from the US have been delayed due to the restrictions imposed by ITAR. Despite the strategic alignment between India and the US, especially in the context of shared security concerns in the Indo-Pacific, the transfer of these drones has been subject to extensive scrutiny because of their advanced surveillance and strike capabilities. The United States, under ITAR, must ensure that such technology is not misused or leaked, which complicates the process of transferring critical systems like the Predator drones to India.

Beyond specific cases, ITAR's broad restrictions also create a degree of uncertainty in India–US defence relations. India, while seeking closer ties with the US, has become cautious about over-reliance on American defence technology due to fears that ITAR could disrupt supplies or support in times of critical need. This was evident during India's border standoff with China when India needed rapid access to high-tech surveillance and reconnaissance equipment. Concerns over ITAR restrictions led India to diversify its defence procurement sources, turning to countries like Israel and France, where the regulatory environment for technology transfer was perceived to be more flexible and responsive to India's immediate needs.[8]

ITAR exerts a profound impact on technology sharing in India–US defence cooperation. While ITAR is crucial for safeguarding US national security and preventing sensitive technologies from falling into the wrong hands, it often creates obstacles for India in its quest for advanced defence

systems. The restrictions under ITAR not only slow down technology transfers, but also limit the depth of collaboration between the two nations in areas like joint production and co-development of future military platforms. As India continues to prioritise strategic autonomy and the modernisation of its defence forces, ITAR's stringent controls may push India to seek alternative partnerships, potentially limiting the full potential of India–US defence cooperation despite their growing strategic alignment.

Another example of ITAR's impact is evident in the area of jet engine technology. India has long sought to develop advanced indigenous fighter jets, such as the Tejas and the futuristic Advanced Medium Combat Aircraft (AMCA). To enhance these programmes, India has looked to the US for the transfer of advanced engine technologies. However, due to ITAR regulations, the transfer of cutting-edge jet engine technology has been limited, as these systems are considered highly sensitive and critical to maintaining US military superiority. Despite India's strategic importance to the US in counterbalancing China in the region, ITAR restrictions have prevented full access to the technology needed for India's next-generation fighter jets. This limitation forces India to either seek alternative partners, such as France or Russia or invest in costly and time-consuming efforts to develop the technology domestically.

ITAR also affects the collaboration on defence production, especially in joint ventures that involve the co-development and co-production of weapons systems. Under DTTI, India and the US aim to collaborate on several defence projects, such as the co-development of next-generation aircraft carrier technology and future combat vehicles. However, ITAR regulations create complications, as the US defence contractors must comply with stringent export control rules that often delay or limit the scope of these projects. For example, when India and the US were exploring collaboration on aircraft carrier technology, ITAR restrictions limited the transfer of advanced catapult and propulsion systems, which are crucial for modern carrier operations.[9] It not only slowed down the negotiations, but also forced India to look for alternatives to meet its technological needs.

In addition to limiting the transfer of specific technologies, ITAR imposes administrative burdens that slow down the overall defence procurement process. Obtaining the necessary licenses for technology transfers under ITAR can be a lengthy and bureaucratic process, which often leads to significant delays. For instance, during India's negotiations to purchase C-17 Globemaster III transport aircraft and P-8 Poseidon maritime surveillance aircraft, the approval process under ITAR took longer than expected,

causing frustrations on the Indian side, especially when rapid deployment of these systems was needed for urgent operational requirements.[10] Such delays weaken the strategic advantage that defence cooperation with the US is intended to provide, particularly when India is seeking to modernise its military to counter growing threats from its regional rivals.

Case Studies and Framework

Analysis of the Defence Technology and Trade Initiative (DTTI)

The Defence Technology and Trade Initiative (DTTI) was established in 2012 as a cornerstone of India–US defence relations, aimed at fostering co-development and co-production of defence technologies between the two countries. The DTTI seeks to overcome the traditional buyer–seller dynamic that has long characterised India's defence procurement from the US, moving towards a more collaborative approach intended to enhance India's defence industrial base while simultaneously aligning with the US strategic goals in the Indo-Pacific region. However, despite its ambitions, the DTTI has faced significant challenges, and its progress has been mixed, offering valuable insights into the broader complexities of technology transfer and defence collaboration.

One of the primary objectives of the DTTI is to facilitate joint projects that leverage the technological strengths of both countries. This was intended to benefit India by granting access to advanced technologies and manufacturing capabilities while allowing the US to deepen its strategic relationship with a key Indo-Pacific partner. A notable example of an early DTTI initiative was the exploration of co-developing the Raven Mini Unmanned Aerial Vehicles (UAVs). The idea behind this project was to allow India to manufacture these surveillance drones domestically, thereby supporting India's indigenous defence manufacturing goals under its 'Make in India' initiative. However, the project faced significant delays and complications, primarily due to concerns over intellectual property and export control regulations from the US side. The inability to fully address these issues resulted in the slow progression of the initiative, highlighting the limitations of the DTTI in effectively navigating barriers pertaining to technology transfer.

Another critical point that needs to be underlined is the effectiveness of DTTI in enhancing high-end technology transfers. While the DTTI is designed to facilitate collaboration on cutting-edge defence technologies, its scope has often been limited to relatively lower-tier systems. For example, the US has been hesitant to share more sensitive technologies, such as those

related to advanced fighter jet avionics, missile systems and next-generation naval platforms. One prominent instance is the joint project to develop the Next Generation Helicopter, which, like other DTTI initiatives, encountered roadblocks due to the US's unwillingness to transfer core technologies essential to the helicopter's operational capability. This reluctance reflects the broader challenge of balancing India's demands for advanced systems with US concerns over safeguarding its military technological edge. Thus, while the DTTI offers a formal framework for cooperation, the actual depth of technology transfer often falls short of India's expectations, resulting in frustration on both sides.

The DTTI also illustrates the broader issue of divergence in strategic objectives between India and the US. India seeks to develop its defence industrial base, which includes a focus on acquiring sophisticated technology to support its long-term goal of achieving strategic autonomy. The US, on the other hand, views the DTTI as a means to strengthen its defence ties with India while maintaining control over critical technologies. This divergence has led to stalled projects and unmet expectations. For instance, India has sought access to technologies such as the electromagnetic aircraft launch system (EMALS) for its next-generation aircraft carriers, which would provide a significant technological leap for the Indian Navy. Despite discussions under the DTTI framework, the US has been hesitant to fully share this technology, citing security concerns and the need to protect sensitive technologies from potential leakage or misuse.

Moreover, DTTI has faced challenges in addressing bureaucratic hurdles that slow down the implementation of joint projects. Both India and the US have complex regulatory frameworks that govern defence procurement and technology transfers. The DTTI has often struggled to navigate these bureaucracies efficiently, leading to delays and breakdowns in negotiations. An example of this is the agreement to co-produce military communications equipment, where bureaucratic red tape and differences in legal frameworks delayed the finalisation of contracts and slowed the actual production process. Such delays have undermined the DTTI's potential to deliver tangible outcomes promptly, particularly in cases where rapid technology adoption is critical to addressing emerging security threats.[11]

Despite these challenges, the DTTI has had some notable successes that illustrate its potential. One example is the agreement on the co-production of C-130J Super Hercules transport aircraft components in India. Under this project, Indian companies were able to manufacture key components for the aircraft, providing a boost to India's domestic defence industry while

demonstrating the potential for collaboration when both sides' strategic and technological interests align. This success indicates that while high-end technology transfers remain problematic, there is room for progress in more mid-level projects where IP and export control concerns are less severe.

While DTTI represents a significant effort to deepen India–US defence collaboration, its effectiveness has been limited by recurring issues related to technology transfer, intellectual property protection, and divergent strategic objectives. The DTTI's successes have primarily been in areas where both nations' interests align more closely, such as in the co-production of mid-tier defence equipment. However, its difficulties in facilitating the transfer of advanced technologies reflect the broader tensions in the India–US relationship, where the desire for cooperation is tempered by competing priorities around national security and technological control. Moving forward, the DTTI will need to address these structural challenges more effectively if it were to achieve its goal of transforming the India–US defence relationship into a partnership based on co-development and shared technological advancement.

Examination of Joint Development and Production Projects

The examination of joint development and production projects between India and the US reveals both the potential for deepened defence collaboration and the persistent challenges that arise from divergent interests and complex regulatory frameworks. These projects are central to enhancing bilateral defence ties, as they offer an opportunity for India to strengthen its defence industrial base while benefitting from advanced US technologies. At the same time, they allow the US to bolster a key strategic partner in the Indo-Pacific. However, the execution of joint development projects has often been hampered by issues related to technology transfer, intellectual property and mismatch in strategic priorities.

One of the most prominent examples of a joint development project is the unsuccessful attempt to collaborate on the Joint Strike Fighter (JSF) programme. India expressed interest in the fifth-generation F-35 fighter jets as part of its long-term modernisation goals for the Indian Air Force. However, the complexities surrounding technology transfer restrictions, particularly those governed by the US's ITAR, coupled with India's insistence on access to critical technologies for domestic production, led to a breakdown in negotiations. The US was unwilling to transfer core technologies related to stealth and avionics systems, which are integral to the F-35's operational capability, due to concerns over safeguarding intellectual property and the

potential risks of technology leakage to other nations. India, seeking to enhance its indigenous defence capabilities under its 'Make in India' initiative, found these restrictions incompatible with its strategic objectives, leading to an impasse. This case highlights the difficulty in balancing India's aspirations for technological self-reliance with the US's desire to protect its competitive technological edge.

Similarly, the co-development of the Advanced Medium Combat Aircraft (AMCA), which is part of India's push to develop a fifth-generation fighter jet, has faced significant hurdles. Although the US initially expressed interest in collaborating on the project, the joint development has been slowed by disagreements over the level of technology sharing. India sought assistance in areas such as advanced materials, avionics and engine technology, but the US was cautious about transferring such sensitive technologies without clear assurances regarding their protection. Moreover, India's defence collaboration with other nations, such as Russia and France, further complicated negotiations, as the US was wary of sharing technologies that could become indirectly accessible to these countries. The project thus remains largely domestically driven, with India having to compensate for the lack of US involvement by seeking technological partnerships elsewhere, demonstrating the limits of joint development when strategic and security concerns are not fully aligned.

Another area where joint development has shown mixed results is naval cooperation. India and the US have explored collaboration on the development of advanced aircraft carrier technologies, including discussions around the Electromagnetic Aircraft Launch System (EMALS). This system is crucial for enhancing the operational capabilities of next-generation aircraft carriers, which India views as essential for projecting power in the Indo-Pacific region. However, the US has been reluctant to transfer this cutting-edge technology without imposing stringent conditions on its use and protection. Despite ongoing talks under DTTI, progress has been slow, with the US remaining cautious about sharing this core capability, while India has sought greater autonomy in using and integrating the technology into its indigenous carrier programmes. The EMALS case exemplifies the recurring challenges of joint development in which US regulatory concerns and India's desire for greater control over production and use often lead to a stalemate.

On the other hand, some joint production projects have achieved notable success, particularly where the technologies involved are less sensitive and fall within areas of mutual strategic interest. A significant example is the co-production of the C-130J Super Hercules transport

aircraft components. Under this project, Indian defence companies have manufactured key components for these aircraft, which are vital to both Indian and US military logistical operations. This initiative has not only strengthened India's domestic manufacturing capabilities but also created a reliable supply chain for US defence contractors. Such projects, which focus on mid-level technologies, have demonstrated that joint production can succeed when the technological stakes are lower and when both nations' strategic and commercial interests align.

Similarly, the collaboration on producing M777 howitzers in India has been another success story. The US and India agreed to co-produce these advanced artillery systems, which are critical for India's military modernisation efforts, especially in high-altitude areas like the Himalayas. The project involved significant local production, providing a boost to India's defence industry while allowing the US to maintain a foothold in India's defence market. This example illustrates that when technology transfer concerns are mitigated, joint production projects can proceed smoothly, benefitting both countries in terms of defence capability enhancement and industrial growth.[12]

Overall, joint development and production projects between India and the US present a complex but promising avenue for deepening defence cooperation. While high-end projects often face roadblocks due to concerns over technology transfer, intellectual property and divergent strategic goals, mid-level projects tend to fare better, as they involve fewer restrictions and more shared benefits.[13] The lessons from both successful and stalled projects underscore the need for clearer frameworks, trust-building measures, and flexible agreements to overcome the obstacles that have hindered the full realisation of joint development potential. For India, achieving its goals of self-reliance in the defence sector through these collaborations will require navigating the intricacies of US export control laws while simultaneously proving itself as a reliable and secure partner for the transfer of advanced defence technologies. For the US, finding ways to share technologies that support India's defence modernisation without compromising its security and commercial interests remains a delicate balancing act, one that will continue to define the future of this bilateral partnership.

India's Domestic Initiatives

Overview of 'Make in India' and 'Atmanirbhar Bharat'

The 'Make in India' and 'Atmanirbhar Bharat' initiatives are central to India's broader economic and strategic vision, particularly in the realm of

defence. Introduced in 2014, 'Make in India' sought to transform India into a global manufacturing hub, with defence manufacturing as a key pillar of this effort. 'Atmanirbhar Bharat', launched in 2020, expanded this vision, emphasising self-reliance across sectors, particularly in defence, where India's reliance on imports has long been seen as a strategic vulnerability. Together, these initiatives represent India's ambition to reduce dependency on foreign defence imports, foster indigenous defence production, and position itself as a global defence exporter. However, their implementation has produced mixed results, revealing both the potential and the challenges associated with achieving self-reliance in defence.[14]

The objectives of these initiatives are clear: India seeks to enhance its domestic defence manufacturing capacity to reduce its reliance on foreign suppliers, boost employment, and promote technological innovation within its defence sector. For decades, India has been one of the world's largest arms importers, relying heavily on countries like Russia, the US, Israel and France for advanced military systems, ranging from aircraft to submarines. This dependency has created vulnerabilities, particularly in times of geopolitical tension. For instance, during periods of heightened tensions with China and Pakistan, India's dependence on foreign suppliers has exposed it to supply chain delays and diplomatic constraints.[15] The 'Make in India' and 'Atmanirbhar Bharat' programmes aim to address these vulnerabilities by developing a robust domestic defence industry capable of meeting India's needs, thereby enhancing national security.

A major aspect of 'Make in India' and 'Atmanirbhar Bharat' programmes is the emphasis on foreign direct investment (FDI) and technology transfer as a means to develop domestic production capabilities. The Indian government has increased FDI limits in the defence sector from 49 per cent to 74 per cent under the automatic route, provided it does not compromise national security. This policy shift has led to greater collaboration between Indian and foreign companies. One of the more successful outcomes of this approach is the partnership between Lockheed Martin and Tata Advanced Systems, which produces parts for C-130J Super Hercules transport aircraft and F-16 fighter jets in India. Such collaborations demonstrate the potential of 'Make in India' to attract foreign investment and expertise, bolstering India's domestic defence manufacturing base while allowing multinational defence corporations to tap into India's growing defence market.[16]

However, despite some successes, the overall impact of these initiatives has been limited due to several structural challenges. One major issue is the continued dependence on foreign technology, particularly with regard

to high-end defence systems. While India has made significant strides in developing indigenous technologies, such as the Tejas fighter jet and the BrahMos missile system (developed in collaboration with Russia), these achievements are often exceptions rather than the rule. Many indigenous defence projects have faced significant delays and cost overruns, largely due to gaps in technological expertise, inadequate infrastructure and bureaucratic inefficiencies. For example, India's ambitious effort to develop its fifth-generation fighter aircraft under the AMCA programme has been hampered by technological hurdles, particularly in areas such as engine development and avionics, forcing India to continue seeking foreign assistance for critical technologies.

Moreover, the success of 'Make in India' and 'Atmanirbhar Bharat' programmes in the defence sector is complicated by the stringent demands of global defence firms regarding intellectual property protection and technology transfer. Foreign companies are often reluctant to share their most advanced technologies with Indian partners due to concerns over intellectual property theft and the potential leakage of sensitive military technologies. This reluctance has led to delays and complications in joint ventures, as seen in the negotiations for the transfer of advanced drone technology and fighter jet engines from the US to India. The limitations imposed by US regulations, such as ITAR, further constrain the extent to which foreign companies can collaborate with Indian firms, particularly on cutting-edge technologies.

In addition, India's defence procurement process remains plagued by inefficiencies that hinder the realisation of 'Make in India' and 'Atmanirbhar Bharat' goals. The process is often slow, opaque and frequently altered by shifting policies, which deters potential investors and delays critical defence projects. For instance, the procurement of new fighter jets for the Indian Air Force under the Medium Multi-Role Combat Aircraft (MMRCA) programme has been repeatedly delayed for over a decade, with multiple rounds of bidding, negotiation and policy changes leading to significant delays in the acquisition of new aircraft. This has led to frustration among foreign defence contractors and raised questions about India's ability to implement its vision for self-reliance in the defence sector effectively.

Furthermore, while 'Make in India' and 'Atmanirbhar Bharat' programmes aim to promote defence exports, India's defence exports have remained relatively modest compared to global leaders like the US, Russia and China. India has made some progress in exporting indigenously developed systems like the BrahMos missile to countries such as the Philippines, but overall, the scale of India's defence exports is still limited by factors such

as the lack of a well-established defence industrial base and competition from more established defence exporters. To achieve the ambitious export targets set under these initiatives, India will need to address these underlying challenges, invest in research and development, and streamline its defence manufacturing and export processes.

The 'Make in India' and 'Atmanirbhar Bharat' initiatives represent a bold vision for transforming India's defence sector, reducing its reliance on imports, and positioning it as a global player in defence manufacturing. While these programmes have had some success in attracting foreign investment and fostering indigenous defence production, their full potential remains hampered by structural challenges such as technological gaps, bureaucratic inefficiencies, and issues related to intellectual property and technology transfer. As India continues to pursue its goal of defence self-reliance, it will need to address these challenges and create a more conducive environment for the development of a robust and competitive domestic defence industry.

Impact on Defence Technology Transfer and Production

The impact of defence technology transfer and production on India's defence capabilities has been profound, shaping both the trajectory of its military modernisation and the broader strategic relationship between India and its defence partners, particularly the United States. The ability to acquire and integrate advanced military technologies has been a critical component of India's efforts to bolster its defence industrial base, reduce dependence on imports, and ultimately achieve strategic autonomy. However, the actual implementation of technology transfer agreements has been fraught with challenges, often constrained by political, legal and security considerations from partner nations, and further complicated by domestic hurdles within India itself.

One of the primary objectives of India's defence procurement policy has been to leverage technology transfers to strengthen its domestic defence manufacturing capabilities. This strategy is most evident in major defence deals inked with the US, such as the purchase of Boeing's Apache attack helicopters and Lockheed Martin's C-130J Super Hercules transport aircraft. Both deals involved provisions for technology transfer that would allow Indian firms to participate in production processes. In the case of the Apache helicopters, for instance, Indian companies like Tata Boeing Aerospace have been involved in manufacturing key components, including fuselages. This has helped build India's aerospace manufacturing capabilities and reduced the overall cost of procurement by encouraging local production. However,

the extent of the technology transferred in these cases has often been limited to non-critical systems, with more sensitive technologies such as avionics, radar systems and weapons integration remaining firmly under US control.

These limitations highlight the primary challenge of defence technology transfer: the reluctance of foreign partners, especially the US, to share cutting-edge military technologies that could compromise their own security or competitive advantage. This concern is particularly salient in the case of India, which has historically maintained a diversified defence procurement strategy, sourcing arms and technologies from multiple countries, including Russia, France and Israel. The United States, bound by export control regulations such as ITAR, has often been hesitant to transfer more sensitive defence technologies to India, fearing the potential for these technologies to be reverse-engineered or passed on to third parties. For instance, despite India's long-standing interest in acquiring advanced jet engine technology, the US has been cautious in sharing this technology due to concerns over intellectual property and strategic control. The General Electric F414 engines, proposed for India's indigenous Light Combat Aircraft (LCA) Tejas Mark 2, represent an area where the US has restricted the full transfer of technology, forcing India to continue its search for domestic alternatives or less advanced foreign options.

Moreover, these restrictions on technology transfer have a direct impact on India's ambitions under its 'Make in India' and 'Atmanirbhar Bharat' initiatives. The limited scope of technology transfer agreements often results in Indian defence firms being relegated to lower-end production tasks, such as component manufacturing and assembly, rather than engaging in the high-value, high-tech elements of defence production. For example, while Indian companies have successfully manufactured components for US defence contractors like Lockheed Martin and Boeing, they have often been excluded from the more sophisticated aspects of defence production, such as systems integration or the development of advanced sensors and weapons platforms. This has constrained the growth of India's domestic defence industry and limited its ability to develop truly indigenous, high-tech military systems.

Additionally, the reliance on technology transfer agreements that are often incomplete or constrained by legal and regulatory restrictions has created a dependence on foreign partners that runs counter to India's broader goal of defence self-reliance. This dependence is particularly problematic in the context of India's evolving strategic environment, where the need for rapid acquisition and deployment of advanced military technologies has become increasingly urgent, particularly in response to rising tensions with China

along the Line of Actual Control (LAC) and ongoing security challenges posed by Pakistan. In such a volatile environment, delays in technology transfer or difficulties in integrating foreign technologies into Indian platforms can have serious consequences for India's defence readiness. The delays in the co-development of the Medium Multi-Role Combat Aircraft (MMRCA) between India and France's Dassault Aviation, for example, left India with a significant capability gap in its air force for years, as indigenous production struggled to keep pace with operational demands.[17]

Despite these challenges, there have been instances where defence technology transfer has had a more positive impact on India's defence capabilities. The Indo-Russian BrahMos missile project stands out as a successful example of technology transfer leading to the co-development of a high-performance military system. The BrahMos supersonic cruise missile, developed jointly by India and Russia, is now a critical component of India's strategic arsenal, deployed across its navy, air force and army. The project has not only resulted in the transfer of advanced missile technology to India but has also led to the establishment of significant production and research infrastructure within the country, contributing to India's long-term defence self-reliance. Furthermore, the success of BrahMos has opened the door for India to export the missile system to other countries, including the Philippines, making it a rare example of India transitioning from an arms importer to an exporter.

The potential for similar successes exists in India's partnership with the US, particularly if regulatory and legal obstacles can be mitigated through frameworks such as the DTTI. The DTTI aims to foster joint development and production of advanced defence technologies by addressing barriers to technology transfer. However, progress has been slow, with many joint projects, such as the co-development of next-generation fighter jets and unmanned aerial vehicles, struggling to overcome the same legal and regulatory challenges that have hindered previous technology transfer agreements. For India to fully realise the benefits of its defence partnerships, together with its partners, including the US, it will need to find innovative solutions to these challenges, such as the development of more flexible technology-sharing agreements and enhanced trust-building measures.

Defence technology transfer and production have had a mixed impact on India's defence capabilities. While some agreements have enabled the development of key military systems and contributed to the growth of India's defence industry, the limitations imposed by foreign partners, particularly in terms of sensitive technology transfer, have often stymied India's broader

ambitions for self-reliance in the defence sector. To fully harness the potential of technology transfer agreements, India will need to address both domestic challenges, such as inefficiencies in its defence procurement process, and international constraints, such as restrictive export control regimes, while continuing to build trust and collaboration with its defence partners.

Proposed Solutions and Future Directions

Flexible Bilateral Agreements

Flexible bilateral agreements are essential in facilitating the transfer of advanced defence technologies between nations, especially in partnerships such as India–US defence cooperation. These agreements serve as tailored frameworks that address the complexities and sensitivities surrounding technology transfers, intellectual property rights and national security concerns, allowing both nations to advance their strategic objectives while mitigating risks. The success and limitations of such agreements are vividly illustrated by the evolution of the India–US defence partnership, where flexibility has become a critical factor in overcoming longstanding obstacles.

Historically, rigid defence agreements between India and the US hindered the potential for meaningful technology transfer. The Cold War era and India's non-aligned stance created significant barriers, limiting defence cooperation and complicating efforts at technology exchange. This began to shift post-2000, as both countries sought to expand their strategic relationship, particularly in the context of regional security concerns like the rise of China and terrorism. However, these efforts were initially slowed by the inflexibility of the US's export control laws, particularly ITAR, which prevented the transfer of sensitive military technologies even to trusted partners like India. For example, India's attempts to acquire advanced missile defence systems and high-performance fighter aircraft from the US were often stalled due to stringent restrictions on technology sharing, with the US government reluctant to modify its policies to accommodate India's strategic needs.

Recognising the limitations of these rigid frameworks, both nations have moved towards more flexible bilateral agreements aimed at facilitating smoother cooperation. One such example is the Communications Compatibility and Security Agreement (COMCASA), signed in 2018, which allows India to access secure and encrypted communication equipment from the US. Before COMCASA, India was limited to less sophisticated systems in its US-sourced military platforms, such as the C-130J Super Hercules

aircraft and P-8I maritime patrol aircraft. The agreement allowed India to equip these platforms with advanced US communication systems, enhancing their operational capabilities and improving interoperability between Indian and US forces during joint exercises. The flexibility of COMCASA lies in its ability to balance India's security concerns with the US's requirements for safeguarding sensitive technologies, creating a mutually beneficial arrangement that could be adapted to evolving strategic needs.[18]

Another example of flexible bilateral agreements in the India–US defence relationship is the Defence Technology and Trade Initiative (DTTI), established in 2012. The DTTI was designed to promote technology transfer and joint development of defence projects by addressing bureaucratic and legal obstacles that often stalled cooperation. The initiative sought to foster a more collaborative approach to defence cooperation by allowing for customisable agreements that could be adapted to the specific needs of individual projects. One of the notable achievements under DTTI was the establishment of joint working groups focused on specific areas such as aircraft carrier technology and jet engine development. While the results of DTTI have been mixed, with some projects facing delays due to regulatory constraints, it represents an important step towards creating a more flexible and responsive framework for defence cooperation. Its success lies in the potential to adapt agreements to the needs of both parties, allowing for more innovative approaches to technology transfer that account for the concerns of both governments.

Furthermore, the Basic Exchange and Cooperation Agreement (BECA) signed in 2020 represents another milestone in flexible defence agreements between India and the US. BECA enables the sharing of geospatial intelligence between the two nations, allowing India to access US satellite data critical for military operations, such as missile targeting and troop movements. This agreement marked a significant shift in the US policy, as previous efforts to share such sensitive information had been stymied by concerns over how the data would be used and protected by India. The flexibility of BECA lies in its provisions for data protection and its recognition of India's evolving security needs, particularly in the context of its border disputes with China. By ensuring that both parties had clear safeguards in place, the agreement enabled the sharing of valuable intelligence without compromising either nation's security interests.

However, despite the progress made through these flexible agreements, challenges remain. Even with frameworks like DTTI and COMCASA, the US remains cautious about transferring certain high-end technologies,

particularly those related to next-generation fighter aircraft, unmanned systems and missile defence. India, for its part, has also been reluctant to fully commit to US expectations in areas like data sharing and military alignment, often due to concerns over maintaining its strategic autonomy. For example, negotiations over the transfer of advanced drone technologies under the DTTI have faced repeated setbacks due to concerns over the extent of technology sharing and the conditions attached to their use. This reflects the continuing tension between flexibility and control in bilateral agreements, where both parties must carefully balance their strategic interests with the need for collaboration.

Moreover, flexible bilateral agreements often require sustained political will and trust between partners. In the India–US context, domestic political considerations and shifting international alliances can affect the implementation and longevity of these agreements. For instance, the political debate in India surrounding closer military ties with the US has often been influenced by concerns over losing strategic independence, particularly in the context of India's historical reliance on Russian defence equipment. This has led to periods of hesitation in fully embracing agreements that deepen defence ties with the US, even when such agreements offer clear operational benefits. Conversely, changes in US foreign policy priorities, such as a shift towards more isolationist policies, could potentially undermine the flexibility and long-term sustainability of these agreements.

Flexible bilateral agreements have become the cornerstone of India–US defence cooperation, enabling both countries to overcome some of the obstacles that previously hindered technology transfer and defence collaboration.[19] These agreements, such as COMCASA, DTTI and BECA, reflect a more adaptive approach to addressing the complex legal, political and security challenges involved in transferring sensitive military technologies. By allowing for customisation and negotiation within specific defence projects, these frameworks provide a pathway for deeper cooperation while respecting the strategic concerns of both nations. However, the success of such agreements ultimately depends on the ability of both India and the US to maintain a balance between flexibility and control, ensuring that their evolving defence partnership can adapt to new challenges and opportunities without compromising national security or strategic autonomy.

Trust-Building Measures and Technology-Sharing Models

Trust-building measures and technology-sharing models are critical in enhancing defence cooperation between nations, particularly in complex

and strategically significant partnerships like that of India and the United States. The success of defence cooperation hinges not only on the formal agreements but also on a foundation of mutual trust, built through consistent engagement, transparency and collaborative practices.[20] The challenge lies in navigating the different strategic cultures, political contexts and security concerns that shape each country's approach to defence technology and ensuring that both parties feel confident in sharing sensitive technologies. In the India–US relationship, trust-building has played a key role in facilitating technology transfers and shaping innovative models of collaboration, although significant challenges persist.[21]

One of the clearest examples of trust-building efforts in the India–US defence relationship is the DTTI, which was established to deepen collaboration by reducing bureaucratic obstacles and encouraging joint development of military technologies. The initiative has served as a platform for both countries to identify areas of mutual interest and address concerns about technology transfer in a cooperative environment. One of the primary trust-building elements of DTTI is the working groups that focus on specific projects, such as aircraft carrier technologies and jet engines. These working groups provide a forum for Indian and US officials to collaborate on sensitive technological issues, fostering direct communication and problem-solving. While the DTTI has not always yielded immediate results, it has been a valuable mechanism for promoting dialogue and building confidence in each other's intentions, which is essential for more complex technology-sharing arrangements.

Another trust-building measure is the signing of foundational defence agreements such as the Logistics Exchange Memorandum of Agreement (LEMOA) and the Communications Compatibility and Security Agreement (COMCASA). These agreements, while initially met with hesitation on both sides, reflect a growing willingness to share critical defence infrastructure and secure communication systems. LEMOA, for example, enables reciprocal access to military bases for logistics support, signalling trust in each other's military operations. COMCASA allows India to access encrypted communication technology used by US forces, significantly enhancing interoperability during joint exercises. These agreements have not only improved operational capabilities but also strengthened the trust between India and the US by demonstrating a shared commitment to secure and collaborative defence practices.[22]

Trust-building measures have also been reinforced by increasing the frequency of joint military exercises such as the annual Malabar naval

exercise, which includes both the US and India as core participants. The Malabar exercises have expanded in scope over the years to include advanced naval warfare operations, which involve complex coordination and the sharing of tactical information. The level of cooperation required for such exercises serves as a practical demonstration of trust, where both countries have to rely on each other's capabilities and technology in real-time scenarios. This operational trust is a key component of defence technology sharing, as it showcases how US and Indian forces can work together with integrated systems while respecting each other's strategic autonomy.

However, the path to building trust has not been without obstacles. A significant challenge has been the US's hesitancy to transfer cutting-edge technologies due to concerns over intellectual property rights, the potential for reverse engineering, and the risk of technology leakage to third parties. India's historical reliance on multiple defence suppliers, particularly its longstanding relationship with Russia, has been a point of concern for the US, raising questions about the security of sensitive technology. For instance, when India purchased the Russian S-400 air defence system, it sparked concerns in Washington that data collected by the S-400 could potentially be shared with Russia, thus compromising US military systems operating in the same space. These issues have slowed the pace of technology transfer, underscoring the need for deeper trust and assurance mechanisms between the two nations.

To address these concerns, India has taken steps to reassure the US of its commitment to protecting sensitive technologies. For example, India has implemented stricter export control measures and intellectual property safeguards to align with international standards, which has helped ease US concerns about the integrity of shared technologies. Moreover, India's push towards developing a comprehensive defence industry ecosystem through its 'Make in India' and 'Atmanirbhar Bharat' (self-reliant India) initiatives signals to the US that it is serious about cultivating indigenous capabilities and reducing dependence on foreign suppliers. By showing a commitment to developing its defence technologies, India has demonstrated a degree of self-reliance that can complement, rather than undermine, its defence partnerships with the US.

Innovative technology-sharing models have also emerged as part of the trust-building process, with both countries exploring ways to collaborate on joint development rather than simple transactional exchanges of finished products. One such model is the co-development approach, which seeks to involve both nations in the research, design and production of

advanced military systems. This approach reduces the risks associated with technology transfer by embedding the two nations into a shared production process, making it less likely that one side will unilaterally exploit the other's technology. For example, under DTTI, the two countries have discussed co-developing advanced drone systems and jet engines, although progress has been slow due to technical and bureaucratic hurdles. The co-development model, however, remains a promising framework for deepening technological collaboration in a way that mitigates concerns over control and security.[23]

Another model of technology-sharing that has gained traction is the establishment of joint ventures between Indian and American defence companies. These ventures allow for technology transfer to take place within a structured corporate environment, where the terms of intellectual property rights, production and distribution are clearly defined and jointly managed. An example of this is the collaboration between Tata Advanced Systems and Lockheed Martin to produce components for the C-130J Super Hercules aircraft. This joint venture has enabled technology transfer in a controlled manner, contributing to India's defence manufacturing capabilities while ensuring that sensitive technologies remain protected within the joint venture framework.[24]

Despite these advances, the technology-sharing models employed in the India–US relationship remain a work in progress. The US remains cautious about sharing its most advanced military technologies, and India continues to balance its desire for strategic autonomy with its reliance on foreign technology. Trust-building measures will need to continue evolving, with both nations exploring more dynamic and transparent forms of cooperation. Initiatives such as the Quadrilateral Security Dialogue (Quad), which involves India, the US, Japan and Australia, provide a broader framework for trust-building and technological collaboration on regional security issues, potentially paving the way for more robust defence partnerships in the Indo-Pacific.

Trust-building measures and innovative technology-sharing models are fundamental to the success of the India–US defence partnership. While challenges persist, both nations have made significant strides in fostering a cooperative defence relationship through agreements, joint exercises and collaborative development efforts. The continued evolution of trust and technology-sharing models will be key to overcoming the remaining hurdles in the partnership, allowing both nations to enhance their defence capabilities while respecting their respective strategic imperatives.

Recommendations for Enhancing India–US Defence Collaboration

Enhancing India–US defence collaboration requires both nations to address the underlying challenges that have slowed progress in technology transfers and joint military projects. Recommendations for advancing this partnership must focus on overcoming bureaucratic hurdles, aligning strategic objectives more closely, and developing innovative frameworks for technology-sharing. These recommendations are essential to deepen the defence ties that both nations need to meet evolving security challenges, particularly in the Indo-Pacific region. However, implementing these recommendations will require sustained political will, creative problem-solving and robust trust-building efforts on both sides.

One of the most important recommendations for enhancing India–US defence collaboration is the need to streamline bureaucratic processes that have often hampered joint projects. Both nations must work towards expediting the approval processes for technology transfers, which have historically been bogged down by cumbersome export control laws, such as the ITAR. India's frustration with the lengthy delays in acquiring critical technologies, like advanced drone systems and missile defencee platforms, has led to missed opportunities and trust deficit between the partners.

Simplifying the process by creating dedicated fast-track mechanisms for defence technology transfers could facilitate quicker decision-making. For example, the establishment of a joint task force with representatives from both governments and key defence contractors could serve well to expedite the review and clearance of defence deals, particularly for technologies that have already been approved under similar agreements in the past. This could prevent bottlenecks like those experienced in the transfer of Predator drones, which have taken years of negotiation despite their strategic importance to bolster India's defence capabilities.

In addition to streamlining bureaucratic processes, both countries should focus on aligning their strategic objectives to ensure that collaboration is mutually beneficial. A critical challenge in the India–US defence relationship has been the divergence in strategic priorities, with the US often seeking to integrate India more closely into its regional security architecture, while India remains cautious about being drawn into great power competition. India has historically pursued a strategy of non-alignment and continues to maintain significant defence relationships with other countries, particularly Russia.

This creates tensions with the US, which has expressed concerns about the security implications of India's defence purchases from non-NATO allies, particularly Russia's S-400 missile defence system. One way to overcome these strategic divergences is for the US to adopt a more flexible approach to India's foreign policy and defence procurement decisions. Instead of seeking exclusivity in defence cooperation, the US should recognise India's need for a diverse portfolio of defence partners and focus on areas of shared interest, such as maritime security in the Indo-Pacific. By focusing on cooperation in areas like naval capabilities, intelligence sharing and cyber defence, both countries can strengthen their partnership without requiring India to make compromises on its strategic autonomy.

Another recommendation for enhancing collaboration is the development of more adaptive and innovative frameworks for technology-sharing. Given the US's reluctance to transfer its most sensitive defence technologies, one solution could be the expansion of joint development and production programmes that allow both nations to share intellectual property and technological know-how while maintaining control over their respective contributions. The co-development model used in projects like the BrahMos missile between India and Russia could serve as a model for similar efforts with the US. For instance, a renewed focus on co-developing next-generation military aircraft or drone technology could provide a pathway for India to gain access to critical technologies while also contributing to the production and innovation process. This would not only enhance India's defence manufacturing capabilities but also reduce the risks associated with technology leakage, as both countries would have a stake in the joint development process.

Furthermore, expanding joint ventures between Indian and American defence companies could offer another avenue for enhancing collaboration. Joint ventures provide a structured environment for technology-sharing while addressing intellectual property concerns through legally binding agreements. The collaboration between Tata Advanced Systems and Lockheed Martin in producing parts for the C-130J aircraft has demonstrated the potential of such partnerships. By deepening these industrial collaborations and expanding them to include more sophisticated systems like avionics and weapons platforms, both nations could build a stronger foundation for defence manufacturing and innovation. Additionally, joint ventures could help India achieve its 'Make in India' and 'Atmanirbhar Bharat' (self-reliant India) objectives by fostering the growth of domestic defence industries with the support of American expertise and technology.

Trust-building measures must also be strengthened to ensure that India and the US can collaborate effectively on defence projects. One way to build trust is through increased military-to-military engagement, including more frequent joint exercises, personnel exchanges and joint training programmes. The annual Malabar naval exercises, which now include Australia and Japan alongside India and the US, have become the cornerstone of defence cooperation in the Indo-Pacific. These exercises should be expanded to include more complex scenarios and joint operations across different military branches, such as air force and army drills, to enhance interoperability and operational trust. In addition, the US could invite Indian officers to participate in its advanced military training programmes (joint command programmes, space warfare curricula, or cyber-operations electives), such as those at the National Defense University, the US Naval War College and the US Army War College, the Space Command College, or Cyber-Command-related training centres, to deepen the understanding of shared strategic objectives and operational tactics.

To support these trust-building efforts, the US should also consider easing restrictions on the transfer of critical enabling technologies, such as advanced radar systems and secure communications equipment. This would demonstrate a commitment to India's defence modernisation efforts and show that the US trusts India as a reliable defence partner. For instance, the US could offer India access to advanced electronic warfare systems and cybersecurity technologies, which are increasingly critical in modern conflicts and are areas where India is looking to enhance its capabilities. By providing India with access to these advanced technologies, the US would not only help India improve its defence readiness but also create opportunities for deeper collaboration in areas like cyber defence and intelligence sharing.

Finally, both nations must continue to prioritise the institutionalisation of their defence partnership through regular dialogue and coordination. Annual defence dialogues, such as the 2+2 ministerial meetings, have been instrumental in maintaining momentum in the defence relationship and should be continued and expanded. These dialogues provide a forum for addressing challenges and setting priorities for future collaboration, ensuring that both nations remain aligned on key defence issues. Additionally, establishing a permanent bilateral defence technology working group that meets regularly to review ongoing projects and propose new areas for collaboration could help ensure that the defence partnership remains dynamic and responsive to emerging threats.

Enhancing India–US defence collaboration requires a multifaceted approach that addresses the bureaucratic, strategic and technological challenges that have historically slowed progress. By streamlining approval processes, aligning strategic objectives, developing more adaptive technology-sharing models, expanding joint ventures, and building trust through military engagement and dialogue, both nations can strengthen their defence partnerships in a way that benefits their respective security interests. These recommendations, if implemented, have the potential to unlock the full potential of India–US defence cooperation, bolstering the capabilities of both nations in meeting the growing security challenges in the Indo-Pacific region and beyond.

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