



February 2022

Critical Technologies of Israel & India

Karthika Ellangovan

Edited by: Aryan Gupta

Critical technologies are novel and emerging methods of coordinated communication between states to promote national interests and strategic objectives. The Indo-Israel relationship benefits greatly from the use of critical technologies, as both states are under constant military threat despite being regional superpowers in their own capacities. For India, the Gulf has proved to be an important investment destination; notwithstanding that military investments and trade has significantly risen in the Indo-Israel partnership. The cooperation for trade and investment are not strictly restricted as they provide a beneficial pathway for the two nations in providing technological support in defence strategy and planning. Hever, in his book titled “The Privatisation of Israeli Security”, employs a distinction between the terms defence and security.¹ While defence is a reactive action to external attacks, security is described to be a duty, one that signifies acts carried out in pursuit of ongoing threats, actual or potential. The ‘duty’ aspect of security is evidently noticed as it is carried out as a normal course of action even when there is an absence of threat or attack. The National Critical Technologies Report defines "criticality" in the broadest possible way--to "develop and further the long-term national security or economic prosperity of the United States."

Israel is a strategic adversary in modern defence and occupying such positions in the international community favours her allying countries. Israel is the largest exporter of kinetic energy weapons in the Western world. India has the potential to collaborate on relevant military technologies as Israel constantly renews its military and technological capabilities on unique grounds. With the current political and geographical structure in both countries, specific cooperative opportunities should be identified to supplement India’s defensive strategies. With the rise in tensions along the eastern border, India must rapidly develop technologies oriented to specific threats. In that regard, critical technologies that are indigenously developed in countries, largely offer benefits like improving the economic prosperity and helping equip national security systems. The term security has different connotations and in the context of Israel and India, it can potentially seek to address internal threats and border security concerns. Israeli defence forces are integrated to include adaptive and intel processing systems that have a diversity of applications. The state has also invested in strategically important sectors like the cybernetics and nuclear sector. An intrinsic system, like that in Israel, can be achieved with government efforts like capacity building and

¹ Shir Hever, “The Privatisation of Israeli Security”, 2018, Pluto Press.

multilayer institutional set-ups. The state also harnesses other aspects that are essential, like the management of these critical technologies. By moulding a synergetic relationship between the managerial and technological aspects, Israel is successful in its technological autonomy and independence. Its rapid deployment of critical and strategic technologies is a key determining aspect of its success and is a testament to its level of expertise in the field. The demand and need for multi-nationalisation of information systems is ever growing. In the case of India, there is a relatively lesser use of information systems that can operate in wide area switched networks. However, India still remains as one of the most crucial buyers of Israeli defence systems, which is a part of the larger booming industrial society that is home to commercially viable designs and innovations. These Israeli technologies are capable of synergising different military sectors. There is a sense of self-reliance that enables Israel to be the political actor it is, in the Middle Eastern region.

THE INDIAN BACKDROP

In the recent past, India has enhanced its strategic partnership with the US through the Quad alongside Australia and Japan, based on a mutual outlook of the Indo-Pacific.² The Indian vision for critical technologies was laid out in a committee headed by Dr Abdul Kalam in 1993, seeking to define and lay emphasis on the national position for such technologies. Fibre optics, heavy particle beams, Gallium Arsenide devices and smart weapon subsystems were some of the technologies that were identified and recognised as ‘critical’.³

One of the main objectives that arose from the committee’s discussion was to increase India’s self-reliance on critical technologies, to further strengthen the objectives of national security. However, self-reliance cannot be achieved overnight; it requires aid in design, development, and manufacturing for a holistic performance. In 2011, The Defence Production Policy of the Government aimed to systematically appropriate a roadmap to develop critical technologies. The

² Kabir Taneja, Ed., “The New US-Israel-UAE-India Minilateral in a Changing West Asia,” ORF Special Report No. 169, November 2021, Observer Research Foundation.

³ S.N. Mishra, Self-Reliance Index and the Enduring Legacy of Kalam, Indian Defence Review, 15 October 2015, available at <http://www.indiandefencereview.com/news/self-reliance-index-and-the-endu>.

policy proposed that such a goal can be reached with an initial boost of imported transfers. For these reasons, the government had to invoke the special Defence Procurement Procedures (DPP) to initiate Transfers of Technology (ToT). Many technologies continue to be partially or wholly provided with the help of imports. For instance, in the indigenous Light Combat Aircraft (LCA) programme, critical subsystems like MMR (Multi Mode Radars), Aero Engine or Carbon Fibres that are required for its structure and stealth capability are imported⁴. Although a fair attempt was made to increase foreign investment in the military sector. Post Kargil, there is no greater involvement or implementation of private sector initiatives. Subsequent committees that were established in the years 2011 and 2012, like the NMCC and the Naresh Chandra Committee respectively, have both established strong reasons to integrate the defence manufacturing sectors with the overall manufacturing initiatives introduced in the country. It is needless to say that this integration is the need of the hour for enhancing the performance of existing technology in the nation. Several academic fellows and policy makers have realised the benefits of an integrated system and a synergised defence department for the country. This aspect of defence planning is seen to be more crucial than invitations for investment. Although investments that may lead to indigenous innovations are promising, India must develop a pathway for both indigenous innovation and foreign technology that allows seamless yet integrated technology transfer(s). If India proves its capability to function in this manner, it will prove to be a powerful statement in terms of her economic, military, and scientific capability. Further, it will also keep up with India's trade competitiveness. This method of functioning can be seen in the relationship between the United Kingdom and Israel.

The Union Budget announced in February 2020, allocated a sum of Rs 8,000 crore for the establishment of a National Mission on Quantum Technologies & Applications (NM-QTA). Besides this, in order to establish a similar and seamless transaction, the challenges faced in the Defence Procurement Procedure (DPP) must be sufficiently addressed. Such protocols of the Ministry of Defence (MoD) must allow for more information on the manner of acquisition, or producing and managing foreign critical technologies so that, the international competitive environment is a familiar space or India. The procurement and making of these technologies will provide multi-dimensional benefits to the country; for instance, it employs an economic edge over

⁴ *Id.*

other countries with fewer access to critical technologies. The Bilateral Innovation Agreement signed between India's Defence Research and Development Organisation (DRDO) and its counterpart Israel's Directorate of Defence Research and Development (DDR&D), in 2021 seeks to promote innovation and accelerated research and development in start-ups and medium small and medium enterprises in both countries, to develop the use of dual use technologies⁵. The India-Israel Industrial R&D & Technological Innovation Fund (14F), in its 8th Governing Body Meeting, has expanded the research lens in the R&D technological field. The joint program provides scope for better cooperation and facilitation of the commercially innovative technologies that benefit both countries in the defence sector, as well as living up to the proposed monetary frameworks. This collaboration holds significant diplomatic value and can open new lines of communication for the countries to become an emerging group for future military and defence collaboration. Another emerging group consisting of the United States, Israel, UAE, and India has already stepped up on their cooperation in trade and investment matters. They have also often showed support for each other on critical political matters. However, discussions within this quad are limited to minimal security agendas rather than opening doors for negotiating overt military deals; it does seem to have strategic undertones aimed at encirclement and containment⁶.

The Israeli approach to integrating critical technologies in their defence and military sector can be seen from its ability to use a broad-spectrum program in multiple technological areas. For collaborative purposes, the system in place makes a thorough examination of the allied countries' existing capable technologies. Investigation is carried out in four areas of defence, namely surveillance, radar, and command, control and communications, armour or anti-armour technology, directed energy weapons and sensor technology.⁷ Such an investigation can be crucial to develop the modalities in specific areas of military technology. Israel does not *per se* require collaborative mechanisms to operationalise its forces, but they do so for a strengthened relationship

⁵ Pramit Pal Chaudhury, "Israel likely to become India's largest arms supplier", The Hindustan Times, July 5, 2017, <https://www.hindustantimes.com/world-news/israel-likely-to-become-india-s-largest-arms-supplier/story-tZQFenVzYWzaQFnPqbznqM.html>; See also, Anna Ahronheim, "Israel, India to build 10-year defence cooperation plan", The Jerusalem Post, October 31, 2021, <https://www.jpost.com/israel-news/israel-india-to-build-10-year-defense-cooperation-plan-683591>.

⁶ See note 2.

⁷ Critical Technology Assessment in Israel and NATO Nations, IDA Memorandum Report M-317, Institute for Defence Analyses.

with their allies; most of these decisions are also pre-negotiated terms and conditions that follow from allied understanding and partnership. Another area that can be explored from the Israeli perspective, is the industry-government relationship and alternative agencies of support for technology. Similarly, the National Association of Manufacturers (NAM) also provides notable recommendations that are aimed at improving technology development and acquisition. Some pointers that have been consistently suggested by the NAM, in the United States is to maintain a sound fiscal and monetary environment in promoting commercial technology⁸. Israel has also made efforts to develop other aspects of its critical technology, like its commercial application and economic dimension that it may provide. Through advancing its binational activities, Israel tries to generate risk capital globally for the development of innovative technology⁹. The legal and regulatory frameworks for such technologies must also be appropriately laid out before industries can pitch in their technological innovations; ones that have military and national defence potential. Critical technologies if made into shared technologies between partnering countries can even boost the logistics of the guest country. For instance, China's investments in Israel worth 1.7 billion USD, for the manufacture of a container terminal built in Haifa by the state-owned Shanghai International Port Group¹⁰.

However, it is also important to note that the Western allegiances to Israel provide them a tactical vision of the unique threats and dangers faced by Israel. One example in this context is Israel's collaboration with the MBB, a German defence manufacturer and contractor and other similar European entities, that has proved to be fruitful on various fronts. Critical technologies also include a nation's ability to monopolise on fewer-researched topics like the betterment of nuclear facilities. This research is converted to hard designs that are created with the help of allied support, but most often than not, Israel is self-reliant for such facilities. SOREQ data presents us with immense advancements made by the nation in the recent decades. Israel's military infrastructure is accredited from the importance given to the fields of applied sciences and advanced research, while most countries may struggle to appoint a framework or hierarchy that manages critical

⁸ Technology Policy and Critical Technologies: A Summary of Recent Reports (1991), Critical Technology Reports, The National Academies Press.

⁹ Dan Izenberg, Science and Technology in Israel, Israel at 50, Israel Ministry of Foreign Affairs.

¹⁰ Navdeep Suri, "Did the US-UAE-Israel trilateral dialogue foreshadow a new Quad with India?", ORF, October 19, 2021, <https://www.orfonline.org/expert-speak/did-the-us-uae-israel-trilateral-dialogue-foreshadow-a-new-quad-with-india/>

technologies. Some sources provide that the United States' critical technologies must be managed by the POTUS, whereas some advocate for it to call upon industry leadership.¹¹ The Israeli approach adopts a novel method of understanding and conducting research on critical technologies; this process is non-exhaustive and interdependent on the partnering industries without strict isolation from each of the entities.

TRADE THEORIES AND CRITICAL TECHNOLOGIES

Technology based trade between Israel and its allied trading partners, allows them to enjoy a competitive advantage in the global markets. Advancements in technological development, governmental policies and support for publicly funded research and development must be favourable for the industry. However, the modalities of decision making for 'generic' and 'critical' technologies differ. Specific recommendations of some economists have observed that trade in IT products cause a ripple effect through the economy that leads to greater overall returns and provides longer benefits than trade in common commodity products¹².

This may be true in an economy for a few reasons like, a lesser demand of resources to be transferred, as most conventional military trade routes have required a sizeable portion of resources to be re-located. To that end, the trade culture in a state can also be benefited by redefining the goals of technological development. The Israeli approach has benefited from this multi-faceted approach by pitching in their innovations to the different sectors of their economy, thereby promoting and expanding the productive capacity of the state. The Law for the Encouragement of Industrial Research and Development dating back to 1984, is aimed at developing science-based export-oriented industries, capable of creating employment and improving the country's balance of payments. Similar studies and reports of the American economy have also suggested the same approach; for instance, in *Modernizing Manufacturing*, a

¹¹ Technology Policy and Critical Technologies: A Summary of Recent Reports (1991), Critical Technology Reports, The National Academies Press.

¹² Krugman PR, Strategic Trade Policy and the New International Economics. 1986 MIT Press: Cambridge, MA

report by an economic policy think tank, Philip Shapira suggests effective industrial extension programs can greatly contribute to reducing the United States' trade deficit.

Kathika Ellangovan is an undergraduate student at the Jindal Global Law School and is an Assistant Editor at the Centre for Security Studies, JSIA. All views expressed in this publication belong to the author and do not reflect the opinions of the Centre for Security Studies.