Priorities for a Technology Foreign Policy for India

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ABSTRACT On 1 January 2020, the Ministry of External Affairs announced the establishment under its wing of the New, Emerging and Strategic Technologies (NEST) division. This marked a welcome addition to the government's organisational capacities in an era increasingly being characterised by the interplay of technology, trade, security and geopolitics. This brief outlines the global and domestic context that will surround the operations of the NEST division, and identifies the domains and processes that will demand the NEST division's immediate attention.

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INTRODUCTION

Across the world, state behaviour is increasingly being shaped by a desire to acquire, secure or manipulate emerging technologies or the supply chains that produce them. This emerging friction will continue to accelerate as 'techno-nationalism' increasingly underpins industrial and trade policy choices.[a] The United States (US) and China—the largest poles of innovation, technology and finance in the international system—are the primary drivers of this new moment. Countries from Asia, Africa, Latin America and Europe are also increasingly concerned about their sovereign powers over emerging technology ecosystems and their implications on social, political, economic and strategic relations.

At the same time, international rules and institutions that manage the global technology system remain largely in a state of flux. Multilateral negotiations on state behaviour in cyberspace are fractured;[1] international negotiations relating to lethal autonomous weapons often end in stalemates;[2] e-commerce regulations are mired in debates around equity and security;[3] standard-setting organisations have become a new frontier for exerting geo-economic influence;[4] and methodologies for how to quantify the digital economy are still unsettled,[5] even as data flows have replaced traditional goods and services as the driver of globalisation.[6]

These headwinds will have an impact on India's ambition, as laid out by the Ministry of Electronics and IT, to grow its digital economy to US$ 1 trillion by 2025. This, even as the country seeks to ride on the wave of growth that will be enabled by IoT, quantum computing and AI.[7] With massive investments flooding into emerging technologies across the board, the global market for AI alone is expected to reach US$ 169,411.8 million in 2025.[8] It is no surprise then that Indian companies are amongst the early adopters of AI, behind only China and the US.[9] A second, perhaps more exigent concern in the minds of Indian policy thinkers, would be managing India's demographic dividend, when India's working age population will be at its peak—a pattern that is projected to end in 2055.[10]

Many of these new entrants to India's workforce will turn to technology-linked jobs, including coding, those related to the gig economy, or in startups. Indeed, India has already emerged as a data labelling giant: homegrown platforms like iMerit and Playment cater to an extensive list of international clients. iMerit alone generated US$6.58 million in annual revenue in 2018.[11] Moreover, with nearly 390 million

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a   Techno-nationalism is a phenomenon whereby a country's technological capacity and innovation is linked to its national identity. This can manifest in protectionist tendencies, narratives on self-reliance, and the 'weaponisation' of technology flows.

internet users (with another 40 million predicted to be added every year for the next decade), India's connected populations present many opportunities for homegrown applications.[12]

Amidst this global and domestic scenario, the Ministry of External Affairs (MEA) announced the establishment under its wing of the New, Emerging and Strategic Technologies (NEST) division that will engage in 'tech diplomacy'. The NEST division is tasked to provide policy guidance on how India can shape international rules related to emerging technologies, navigate competition over strategic supply chains to capture a larger share of global technology flows, and align India's as yet discordant domestic technology policies with international regimes that are straining under complex geopolitical and institutional pressures. This brief identifies five thematic domains and five organisational processes that demand attention.

DOMAINS

Managed Technology Interdependence with China

Amongst the most immediate policy concerns for NEST is technology interdependence with China. While the question of Huawei's 5G ambitions in India is arguably the animating reason behind the incubation of the NEST division, the challenge does not end here. Chinese investors are the largest actors in India's technology landscape, permeating industries like e-commerce, aggregation,

cloud services, and entertainment.[13] As the US and markets in Europe have come to learn, however, Chinese investments in the technology industry often render the recipient countries vulnerable to cyber-espionage, forced technology transfer, and the introduction of cyber-vulnerabilities. [14]

China's Communist Party shares an opaque relationship with the country's industrial and business sectors. The convergence of policies such as the Make in China 2025 Initiative and the Civil-Military Fusion Initiative, and China's national cyber security laws, have arguably turned China's technology ecosystem into an effective extension of its intelligence and information power. [15] India has already recognised this threat, by banning nearly 200 popular Chinese mobile applications and their clones—although the decision was motivated primarily by the desire to respond to China's territorial aggression in the Himalayas.[16] Similarly, India now also requires government approval for all foreign direct investment (FDI) from China.[17] It also seems increasingly likely that Chinese 5G vendors like Huawei and ZTE will be denied access to the Indian market.[18]

These measures serve as a useful example of the policy challenges confronting India. On one hand, it has become untenable for India to remain technologically dependent on a geopolitical rival with whom competition—and even conflict— is only becoming sharper. On the other, India cannot afford to avoid engagement with the same rival, which is after all, the world's second largest economy. So far, the

decision to restrict Chinese investments, applications, and infrastructure has been justified by overarching references to national or economic security, without engaging in a cost-benefit analysis or publicly attributing specific instances of harm to either the Communist Party or Chinese corporations. This is not a sustainable template. A long-term strategy for India would be to continue to attract investments, restrict some markets where national security is at stake, use legal and regulatory tools to obtain technology and know-how, and create oversight mechanisms and shape China's international behaviour.

Navigating Technological Protectionism

Another domain that needs immediate attention relates to new export controls, sanctions regimes, and a broader instinct to "guard" technology ecosystems that are fast emerging. In the first week of January, the Trump administration announced a new export control regime for geospatial imagery software[19] as part of a broader Department of Commerce (DoC) mandate to identify export restrictions on strategically relevant technologies.[20] Later in May 2020, the DoC expanded its efforts, putting in place additional restrictions that prohibit even third-party semiconductor vendors that use US technology and equipment from doing business with Huawei.[21] The coming years will likely see new restrictions take shape in the US—and subsequently the European Union (EU) as well—as it currently reviews its export control rules for dual-use technologies to update.[22]

While these new developments principally target China, it is not inconceivable that India will suffer collateral damage. India has often shared an adversarial relationship with arms control regimes. During the Cold War, arrangements such as the Australia Group, Missile Technology Control Regime, and Wassenaar Agreement were often used to deny India the ability to acquire and invest in technologies related to missile and nuclear development.[b] These dynamics have changed to an extent: today New Delhi is more central to shifts in the global balance of power and is an integral part of new issue-based coalitions such as

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b   The Wassenaar Agreement (estd. 1995) is an export control arrangement that restricts transfers of dual-use technologies and products to non-members. While not explicitly a Cold War instrument, it is the successor of a Cold War relic, the Coordinating Committee for Multilateral Export Control (COCOM), which restricted exports of certain products to the Eastern Bloc. India became a member in December 2017.

In January 2018, India joined the Australia Group (estd. 1985), another export control regime centered on preventing the spread of chemical and biological weapons.

the Quadrilateral Initiative or the Global Partnership on Artificial Intelligence.[c] Even so, India should not ignore national and international restrictions that may create unexpected second-order effects or harm its development or security interests.

New export control regimes are only one part of a broader trend of Western industrial powers creating new synergies between economic, technological and national security. While they may appear like direct responses to China's geo-economic rise, they can cumulatively entrench a new regulatory environment for other rising powers as well. Over the past few years, the US has significantly expanded the ambit of the Committee on Foreign Investment in the US (CFIUS),[23] creatively leveraged tariffs and reciprocal measures against technology theft,[24] and initiated reviews of foreign technology platforms.[25] It is still uncertain whether these tools will ever be employed against Indian actors, but developed economies have found issues in the past with India's laws on intellectual property and data protection, and other regulatory regimes.[26] Emerging export control rules

from the US are also likely to prompt reciprocal measures from China—this will have uncertain implications for Indian interests. The NEST division should identify the potential impact of this emerging brand of technological protectionism on India's interests.

Global Data Governance

The third domain is cross-border data flows and related rules and regulations. Once subject only to domestic regulation, the subject of data flows is fast becoming a contested issue of global governance. The World Trade Organization (WTO), for instance, expects to recommence negotiations over international rules governing the cross-border flow of data toward the end of 2020.[27] Other states are aggressively securing their own interests through emerging trade rules as well, such as the US–Mexico–Canada Agreement (USMCA), the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) or even the Regional Comprehensive Economic Partnership (RCEP).[28] Reports indicate that China is

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c   India became a founding member of the GPAI – a multistakeholder initiative on responsible development and use of AI, in June 2020.

The Quadrilateral Initiative (or Quad) was established in 2007 and revitalised in 2017. It is an informal strategic alliance between the US, India, Japan and Australia, implicitly geared toward balancing militarily against China. It has since also become a launch point for technology-related cooperation, most recently in the form of a supply chain resilience initiative:

https://m.economictimes.com/news/economy/foreign-trade/india-japan-australia-supply-chain-in-the-works-to-counter-china/amp_articleshow/77624852.cms?

also planning to propose a new set of global standards for data flows and security.[29] New Delhi, meanwhile, has remained an outlier in these conversations, refusing to endorse the G-20's proposition of cross-border data flows and stonewalling the 2017 'friends of e-commerce' meeting at the WTO. [30]

To be sure, there is merit to India's claims that regimes governing cross-border data flows must also acknowledge the development and economic interests of emerging economies. However, delay and ambiguity are costly, particularly when the challenge is primarily internal. India's policy positions on data governance have been mired in disagreement between businesses, civil society and government departments in the Ministry of Electronics and Information Technology (MeitY), Ministry of Finance (MoF) and the Department for the Promotion of Industry and Internal Trade (DPIIT) on a wide range of issues.[31] A significant hurdle relates to how the government defines 'data' and prescribes the attendant rights and limitations. The government has variously referred to data in terms of personal right, as a public good and as a national resource,[32] providing little conceptual clarity to other policymakers and businesses.

India must overcome these conceptual and organisational hurdles, if it is to align its domestic and international policy tools for data governance. Although the global data governance narrative often pits advanced and emerging economies against each other, not all developing nations subscribe to 'data nationalism'.[d] Should New Delhi continue to advance some version of this framework domestically, it will face pressure to create coherent and synergetic international propositions, or else risk isolation on this issue. [33]

A Coordinated Drive for IndiaTech

Underpinning both efforts on the management of technological interdependencies as well as navigating the winds of protectionism should be a strong IndiaTech proposition. Government technology policy, whether it be externally or internally oriented, is often reactive rather than proactive. The Government of India was, for instance, a straggler on outlining a strategy for artificial intelligence. Moreover, while there is a coordinated push on capturing the data of Indian users of international platforms, there has been relatively little thought on how this data can be leveraged, and on creating a policy ecosystem conducive to innovation.

The government's propositions for *Make in India*, and "*Aatmanirbhar Bharat*", both of which have seen added impetus following the COVID-19 outbreak and clashes with China's People's Liberation Army (PLA) in

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d   Data Nationalism refers to actions of nation-states to ensure control over data, often with the stated intention of meeting national security, economic or ideological requirements.

Galwan,[e] will continue to grow in salience in light of the trends identified in the earlier sections of this brief. In the short term, this would involve technology partnerships with trusted partners. India has, for instance, established partnerships with Japan on AI and robotics, as well as between Mahindra and Israel's Aeronautics Group on unmanned aerial vehicles (UAVs).[34] India's technology partnership with Australia too is at a positive juncture, with the signing of the framework arrangement on cyber and cyber-enabled critical technology cooperation.[35]

These partnerships must be supported by clearing domestic bureaucratic roadblocks, including improving the ease of setting up enterprises, and simplifying – in the case of angel investment, easing – tax regimes. Here, dialogue between government on one hand, and businesses and startups on the other, is essential. Policy inputs from various stakeholders must be integrated into the drafting process, as opposed to being relegated to a post-facto role. In this area, the launch of the Emerging Technologies Initiative — a partnership between NEST and the Office of the Principal Scientific Advisor that will enlist multidisciplinary, cross-sector teams to craft strategy reports for indigenisation of key technologies — is an encouraging development.[36]

Norms, Standards and Rule-Making

The final domain is international norms and standards. There is yet no unified approach that is discernible from India's engagement with international institutions, despite having participated in several institutional processes over the years.[37] For instance, the country is a member of both the United Nations tracks on state behaviour in cyberspace, despite their often-contradictory positions, and has not made any substantive contribution to either process.[38] Its most recent submission to the UN Open Ended Working Group pre-draft report were withdrawn from the website. Similarly, New Delhi has not endorsed the Paris Call for Trust and Security in Cyberspace[39] but did sign onto the Christchurch Call to Action.[40] No publicly available documents currently explain these approaches or differences. Speculation within academia suggests that its behaviour in international institutions is often dependent heavily on personnel changes,[41] while its willingness to endorse or refrain from certain regimes is a function of preserving sovereign space for offensive cyber options.[42]

India's incoherent approach to cyber norms—international processes that have existed for many years now— augurs poorly for its capacity to participate in norm-setting processes around a range of other as

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e   The clash between Indian and Chinese forces at Galwan precipitated a series of retaliatory digital measures in 5G, apps and so on, described in the domains section of this paper, along with a parallel push for Indian apps and technology vendors, under the label of Aatmanirbharta or self-reliance. https://aatmanirbharbharat.mygov.in/

yet esoteric technologies, such as the World Health Organization's (WHO) efforts at developing global standards for governance of genetic editing technologies.[43] It is also unclear to what extent India's private sector is willing and capable of playing a role in formulating global norms for emerging technologies, to what extent they relate to India's diplomatic positions and priorities, and what level of coordination exists between the government and industry.

Beyond norms, India has also not identified strategies to navigate an emerging contest for international standard setting. China, for instance, is a leading actor in organisations such as Internet Society, Institute of Electrical and Electronics Engineers (IEEE) and the International Telecommunication Union (ITU); setting standards for a broad range of industries that use AI, IoT, 5G and other frontier technologies under the banner of the Chinese Standards 2035 initiative.[44] Publishing standards creates certain lock-in effects and path dependencies that carry significant economic and strategic benefits for those who successfully entrench them. More worryingly, standards offer states the opportunity to "encode" their values into the global technology system. ITU standards for facial recognition technologies, for instance, are being heavily shaped by Chinese actors, and pay little heed to human rights concerns.[45]

Both norms and standards will be critical to India's 'rule-making' aspirations but are currently the levers that India cannot employ well. Building state capacity in these domains will require long-term efforts that build domestic consensus between government, business and civil society and focused state support to international normative and industrial efforts.

PROCESSES

NEST Should be Empowered to Function as a Nodal Agency

The establishment of NEST points to an acknowledgment that emerging technologies should be a pillar of India's foreign policy in their own right. NEST must be empowered to break down silos to connect domestic policymaking on data governance, fabrication facilities, AI research and more with its bilateral and multilateral engagements.

The challenge of breaking down silos is daunting, yet some fundamental steps have already been taken. The 2019 batch of the Indian civil servants, for instance, took common foundational courses covering AI, big data, and the future of work and manufacturing, among others.[46] The prime minister himself has said that "silos are a big bottleneck in the functioning of the union government" and urged officers to "adopt innovative ways to break silos, which will result in the speeding up of various processes of governance."[47] NEST's challenge will be to navigate both inter-ministerial and intra-ministerial silos, all with established

international networks and arrangements, tackling different issues under the NEST mandate.

The Ministries of Commerce and Industry (MoCI); MeitY; the National Security Council (NSC), the Principal Scientific Advisor to the Government of India, and other government actors are all actively engaging in policy and strategies on emerging technologies. As a nodal agency, NEST should liaise with all these government bodies. NEST should also identify institutions which already, to varying degrees, engage in science and technology diplomacy and coordinate initiatives managed by various government bodies that relate to its remit. The Department of Science and Technology, for instance, is responsible for managing four "science wings" in the US, Japan, Germany and Moscow along with a raft of other multilateral engagements.[48] The Department of Biotechnology, meanwhile, coordinates bilateral partnerships with over 20 countries.[49] There are several such institutions whose mandate includes international cooperation, including civilian ones such as the Department of Space, the Council of Scientific and Industrial Research, the Ministry of New and Renewable Energy, military institutions such as the Perspectives Planning Division of Indian Army and the Defense Research and Development Organisation, and public-private efforts such as the Global Innovation Technology Alliance.[50]

Given that several established channels for international cooperation already exist, manpower and resources from these institutions can supplement NEST's networked capacity, even with limitations of the Government of India's budgets. This would require that first, NEST be sufficiently staffed with officers who will create these bridges and second, NEST create a database of the various ministries' and agencies' efforts – an exercise that would also be useful for potential partners in India and elsewhere to understand points of engagement.

NEST's Mandate Must Be Clearly Defined Within the MEA

NEST enters a milieu of entrenched processes within the MEA itself and, as a new division, must both define itself vis-à-vis these practices while not diluting its mandate as a nodal agency. There is, for instance, considerable overlap with the e-governance and information technology, cyber diplomacy, and disarmament and international security affairs divisions. Moreover, the existing geographic divisions already handle much of the bilateral engagement on emerging technology cooperation.[51] NEST also falls under the purview of the Secretary of Economic Relations, putting it inexplicably alongside the divisions for multilateral economic relations, economic diplomacy, and development partnerships.[52]

The Minister for External Affairs, S. Jaishankar, has demonstrated willingness to re-orient the MEA in line with India's changing foreign policy ambitions; in January 2020, for instance, the MEA reoriented its priorities to emphasise soft

and cultural diplomacy.[53] NEST should be similarly placed vis-à-vis the existing divisions of the MEA in a way that speaks to the importance of its role. While substantive gaps in knowledge can be covered by leveraging a network of external consultants representing a diverse set of views and disciplines, these insights cannot be put to use if NEST is unable to integrate these insights into the MEA's disparate efforts on emerging technologies.

Mapping India's Technological and Economic Dependencies

The Government of India must develop the capacity to monitor the development and deployment of technologies critical to the country's economic and security interests. Data about India's integration into value chains is erratic, leading to unreliable information for policymaking. As one analyst demonstrates, for instance, the government does not have a reliable tally of all Chinese investments in India.[54] In 2017, China's official figures suggested that it had invested USD 8 billion into India, while India's own FDI reports placed that figure at USD 2 billion.[55]

Unless this information is readily available to policymakers, formulating effective economic policy for emerging technologies will remain complicated by continuous disruptions to patterns of trade and commerce. Both the US and China, for instance, have demonstrated the capacity to make targeted interventions along supply chains. Many of the Trump Administration's early tariffs targeted those supply chains that were critical to the 'Made in China 2025' initiative.[56] China's retaliatory tariffs, on the other hand, targeted political constituencies that were important to the Trump Administration.[57]

India must similarly build capacity to identify in granular detail its position in the value chain, dependencies on critical imports, and the risk it faces from foreign or international rules. Blanket, untargeted efforts like mandating government approval for FDI will only serve to discourage investors and cripple India's technology sector.

Leveraging 'Third Way' and Bridge Diplomacy

India's measured stance on technology policy is one echoed by several countries, especially in developing Asia and Africa that desire to capitalise on the Fourth Industrial Revolution without having their autonomy curtailed by strategic contests between the US and China.

India has had a handful of projects geared toward digital-led development cooperation. Under the Pan African e-Network project, for instance, India set up a fibre-optic network to facilitate tele-education, tele-medicine, and VoIP services.[58] India discontinued services in 2017 and handed over the project to the African Union.

India's appeal as a technology trade partner lies in its appreciation of many countries' ambivalence on the US-China rivalry. With Southeast Asia and Africa frequently characterised as "battlegrounds" for the two powers' influence, India could offer an attractive alternative, not least because of a shared understanding of the promise of emerging technologies as both a geo-strategic tool and a crucial element of economic development, and the transformation of livelihoods and governance.[59] India's reliability as a partner therefore hinges on being able to put across a compelling message with clear animating themes. For instance, India's emphasis on inclusive development, epitomised in concepts like #AIforAll and the "Trillion Dollar Digital Opportunity" resonates with many countries in developing Asia and Africa.[60]

The Government of India's proposition for an *Aatmanirbhar Bharat* is anchored on the creation of tools that can address the challenge of inclusive growth. For instance, IndiaStack, which provides homegrown full-stack API solutions to enable access to and the growth of India's digital economy, has generated interest in developing countries like the Philippines, Morocco, Algeria and Tunisia.[61]

India's importance as a partner for developed economies, paired with an emerging technological entente through initiatives like the Global Alliance on Artificial Intelligence[62] also create an opportunity to bridge its traditional role as development partner and emerging role as a norms shaper to create new synergies in the realm of global science and technology diplomacy.

Presence at International Norms-making Forums

India's great-power ambitions are often undermined by its low-key presence at important emerging technology-linked rule-setting and norms-making processes. In some instances, such as the Budapest Convention, India has understandably declined to join as it was not part of the negotiations and therefore had no say in the rules.[63] At other forums, like the UN GGE on Lethal Autonomous Weapons or the OEWG on Responsible Behavior in Cyberspace, the Indian delegation must build and/or maintain momentum.

The first imperative is for India to clarify its position on international law as it applies to cyberspace and related emerging technologies regimes, as well as its key priorities in these areas. For instance, while the Indian delegation has used the term 'cyber sovereignty' to describe its position on the Budapest Convention and the OEWG on Cyber, it has yet to put forward a clear definition of this term.[64] Second, NEST, as a nodal agency, can help aid India's presence at multilateral and multistakeholder forums by continuing dialogue even while these forums are not in session. This can take the form of

bilateral or multilateral summits with smaller groups of countries with whom India's interests may align. This offline engagement can be supplemented by online ones, including awareness campaigns on Twitter, webinars, and virtual meetings.

CONCLUSION

The creation of MEA's NEST division is testament to the importance of a unified 'Indian' message on emerging technologies. However, it enters a complex domestic milieu, and faces the challenge of not only harmonising disparate efforts by various parts of the government but also shaping a technology foreign policy that will help feed the aspirations of India's 1.3 billion people.

Internationally, the trade and data flows that have helped India prosper are now in the midst of sovereign tussles, necessitating strong regulation at home backed by a consistent and assertive position at international rulemaking bodies. NEST must be afforded the access and resources needed for a mission of such magnitude, as this brief has highlighted. India must back its claim as a technology power with a strong and clear message, which in turn can become a clarion call for other nations navigating similar waters. ORF

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