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Issue Brief

Embedded Rivalry: Technology as an Arbiter in US-China Great Power Competition

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Summary

Technology has assumed critical importance in the ongoing 'strategic competition' between the United States and China. The technology-infused great-power competition is likely to reshape the current structure of international relations. There is a likelihood of the emergence of two opposing techno-political systems led by China and the US, with the rest of the world faced with a choice: side with one at the expense of the other. India's strategic autonomy may be strained to the maximum in navigating this scenario. India can and should, therefore, help strengthen open source technical systems, backed up by the heft of its market that may be adopted by countries unwilling to toe a particular political line and yet not compromise on their developmental priorities.

Technology has assumed critical importance in the ongoing 'strategic competition' between the United States (US) and China. This elevated role of technology is evident in both countries' recently released national security documents, sketching out the broad outlines of their conceptions of technology. A close reading of these texts, contextualised through recent events, reveals a major schism that is likely to 'silo' the world into two camps. In the competition for technology, the world is likely to witness the manifestation of a great power struggle which is likely to reshape the current structure of international relations.

The US National Security Strategy (NSS) was released on 12 October 2022[1] and the Work Report was submitted to the 20th National Congress of the Communist Party of China (CPC) by Chinese President Xi Jinping on 16 October 2022[2]. In both documents, technology is starkly visible not only as a competitiveness imperative, like Immanuel Kant's thing-in-itself but is also embedded in the various political, cultural, economic and social factors which purportedly distinguish the two countries, representing two diametrically opposite worldviews. The Brief analyses the role of technology as a component of the strategic competition between the US and China in the 2022 NSS and Xi's Work Report. It then teases out the various issues, core as well as peripheral, related to technology that underpin this competition. The implications for India are laid out briefly at the end.

The US National Security Strategy (NSS)

The NSS is divided into four broad sections. In the Preface, President Joe Biden identifies three core tenets of the document: advancing US vital interests; outmaneuvering geopolitical competitors; and tackling shared challenges. While climate change forms the shared challenge, China and Russia find their way into the list of geopolitical competitors. Technology, despite not being overtly mentioned in the preface, is hidden in plain sight. Climate change, China and competition are undergirded by technology and that too, a specific set of technologies based on *computing*, *energy*, *biology* and *engineering*.[3] From tackling climate change through the commissioning of smart electric vehicles (EVs), and lithium batteries to competing against China in the field of 5G communications, quantum computing, internet of things (IoT), semiconductors and artificial intelligence (AI) based applications and platforms, the entire NSS is awash with the prioritisation of technology for advancing US interests.

[1] **"National Security Strategy"**, The White House, October 2022.

[2] **"Full Text of the Report to the 20th National Congress of the Communist Party of China"**, Ministry of Foreign Affairs of the People's Republic of China, 25 October 2022.

[3] A. Azhar, *Exponential: How Accelerating Technology is Leaving Us Behind and What to Do About It*, London: Random House Business Books.

Even the statement on America's allies and partnerships has a significant focus on critical and emerging technologies (CET). One of the mainstays of the AUKUS (Australia–UK–US) trilateral has been on AI, quantum computing, innovation and cyber warfare, apart from the much-proclaimed transfer of nuclear submarine technology to the Australian Navy.[4] Similarly, out of the six leader-level working groups in the Quad, four (climate, CET, cyber and space) focus on technologies.[5] The US–European Union (EU) Trade and Technology Council (TTC) plans to coordinate the setting of international technology standards in CET[6] and ensure that the technologies developed reflect the liberal norms of the Global North or the colloquial West, among other aims. A number of other multilateral, plurilateral and bilateral mechanisms have been established by the US to ensure that a substantial number of countries around the world are at least cognisant of the US view of CET, if not subscribe to it.

Section I of the NSS, 'The Competition for What Comes Next', frames the contest between the US and China as that between freedom and authoritarianism. While the competition with China is part of the great power competition, the second is borderless and can be considered as a basket of challenges—climate change, food security, communicable diseases, energy shortages and inflation that have now been framed from a security perspective. The NSS states that the most pressing strategic challenge is from authoritarian governance and a revisionist foreign policy which leverage CET and supply chains for coercion and repression and export an illiberal conception of the international order.[7]

Here the inevitable reference is to the New Internet Protocol attempts by China to export its top-down hierarchical model of the internet[8] and subsequently data governance to other countries, use of digital wallets such as Alipay and We Chat Pay in South Asian and Central Asian nations, reinvigoration of the Digital Silk Road (DSR) by internationalising the renminbi (RMB), and displacing the dollar as the world's reserve currency.

The NSS notes that the US has historically converted domestic and foreign challenges into opportunities for reform and rejuvenation. The Third Offset of the Department

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[4] R. Vignesh and Abhay Kumar Singh, **"One Year of AUKUS: An Assessment of Progress and Challenges"**, Issue Brief, Manohar Parrikar Institute of Defence Studies and Analyses (MP-IDSA), 2 November 2022.

[5] **"Fact Sheet: Quad Leaders' Tokyo Summit 2022"**, The White House, 23 May 2022.

[6] **"EU-US Trade and Technology Council: Strengthening Our Renewed Partnership in Turbulent Times"**, European Commission, 16 May 2022.

[7] **"National Security Strategy"**, n. 1, p. 8.

[8] Munish Sharma, **"New Internet Protocol: Redesigning the Internet with Chinese Characteristics?"**, Commentary, Manohar Parrikar Institute for Defence Studies and Analyses (MP-IDSA), 15 October 2020.

of Defense (DoD)[9] and the Creating Helpful Incentives for the Production of Semiconductors (CHIPS) and Science Act of 2022[10] may be seen as apt examples of the same. While the former was a reaction to the likely superiority of the People's Liberation Army (PLA) in autonomous weapon systems and AI applications, the latter is a more robust and long-term response of onshoring advanced semiconductor manufacturing capabilities back to the US mainland, apart from creating a science and technology talent base within the country.

With respect to the second challenge of climate change, there is a concerted attempt by the US, in coordination with its European allies, to reduce their dependence on fossil fuels. Weaponisation of interconnectivity and the digital economy is also part of the second challenge. Ironically, it is the US, which has leveraged the global networks of informational and financial exchange, like SWIFT, for strategic advantage.[11]

The US intends to strengthen its capabilities to not only compete against strategic rivals, but also to enhance collective action against global challenges, as well as shape the rules for technology, cybersecurity, trade and economics. The implication is that all four are interlinked. In fact, one of the unique facets visible in the NSS is the assertion that technology, trade and security are to form the connecting bridge between Europe and the Indo-Pacific. Quad and AUKUS are the most visible and securitised strands of this thinking.

The US also seems to be shedding its market-based approach towards certain industries. A convergence is evident between the US and Chinese models for the solution to the strategic competition. Both countries have made state-backed investments into critical technologies the basis for remaining one step ahead of their competition. While the US describes it as "strategic public investments",[12] the Chinese Communist Party calls these industries "national champions".[13] Historically, the American private sector, especially the one based in California's Silicon Valley and the hub for the world's innovation in AI, autonomy, 5G and quantum computing, has been loath to complement US's strategic and operational

[9] G. Gentile et al., *A History of the Third Offset, 2014–2018*, RAND, 2021.

[10] **" FACT SHEET: CHIPS and Science Act Will Lower Costs, Create Jobs, Strengthen Supply Chains, and Counter China"**, The White House, 9 August 2022.

[11] Henry Farrell and A.L. Newman, **"Weaponized Interdependence: How Global Economic Networks Shape State Coercion"**, *International Security*, Vol. 44, No. 1, pp. 42–79.

[12] **"National Security Strategy"**, n. 1, p. 11.

[13] Chen Li and Muyang Chen, **"National Champions, Reforms, and Industrial Policy in China"**, in Arkebe Oqubay and others (eds), *The Oxford Handbook of Industrial Policy*, Oxford Handbooks, 2020, pp. 716–48.

plans.[14] But the environment seems to be changing.[15] The US is also planning to invest strategically in supply chains of CET such as microelectronics, advanced computing, biotechnology, clean energy and advanced telecommunication.[16]

Section II of the NSS, 'Investing in Our Strength', calls for the convergence of the foreign and domestic policies of the country,[17] eerily echoing China. The US has spelt out clearly the areas where the private sector has not mobilised to protect its core economic and national security interests which also include national resilience. In the light of these measures which some may term protectionist and even insular, their synchronisation within the multilateral institutions dealing with technology standards, development and deployment will be a challenge, especially for regional powers such as India whose strategic autonomy will be put under considerable strain.

The importance of semiconductor supply chains is reiterated alongside a host of important legislations such as the Infrastructure Investment and Jobs Act, National Biotechnology and Biomanufacturing Initiative and the Inflation Reduction Act.[18] There is also a focus on countering intellectual property (IP) theft, forced technology transfers (ToT) and cyber-espionage—all targeted against China, though the country is not mentioned explicitly. The US also intends to use coercive and legislative tools to stop the pilferage of technology including but not limited to export controls, enhancing investment screening and counter-intelligence resources. The NSS talks about influence and propaganda operations by state actors and refers to tackling "weaponised corruption", information manipulation operations, political interference and "attacks on rule of law", i.e., election manipulation.[19]

A more foundational focus is on providing high-quality education and training in the field of science, technology, engineering and mathematics (STEM). While the first part of the CHIPS Act deals with the incentives to semiconductor firms to shift advanced chip manufacturing to the US Homeland, the second half is equally, if not more, critical. It focuses on incentivising research and development of basic sciences and identifies areas where pure research is required. There is also a focus on

[14] S. Shane and D. Wakabayashi, **"'The Business of War': Google Employees Protest Work for the Pentagon"**, *The New York Times*, 4 April 2018.

[15] Colin Demarest, **"Siemens, 29 others added to Air Force's $950 million JADC2 Contract"**, C4ISRNet, 23 September 2022.

[16] **"FACT SHEET: CHIPS and Science Act Will Lower Costs, Create Jobs, Strengthen Supply Chains, and Counter China"**, n. 10.

[17] **"National Security Strategy"**, n. 1, p. 14.

[18] Ibid., p. 15.

[19] Ibid., p. 16.

encouraging women and people of colour (POC) to take up STEM as their future career options.[20]

The NSS also calls for the "development of new regimes where gaps persist" to prevent the alleged "degradation of technological advantages".[21] The US expects its allies to contribute to bolstering deterrence and investing in US-like capabilities in their militaries. This has two implications: one is the likelihood of convergence of technologies within a single techno-legal-political system based on the West and separate from the one envisaged by China and which may also include Russia. The rest of the countries will have to decide which technological and therefore political standard to adhere to since they will theoretically be incompatible with each other.

The second implication is the newly-minted concept of Integrated Deterrence[22], which is a mix of the Cold-War era style US nuclear umbrellas, the whole-of-government approach and the new Mosaic-era[23] warfighting capabilities. Integrated Deterrence imagines a strong, joint-force-based deterrent posture spread across regions and geographies which will be active across all physical and virtual domains of warfare and will subsume under itself conventional, sub-conventional, nuclear and grey-zone operations.[24] A few iterations of a similar concept have preceded this all-encompassing term such as 'Battle of Cognition' by General Mark Milley[25] and 'Hyper war' or 'Revolution in Human Affairs' in a 2017 paper by General John Allen (Retired) and Amir Hussain.[26] For its allies and partners in the Indo-Pacific, the US has come up with the Indo-Pacific Economic Framework (IPEF) which has four pillars, i.e., trade and digital economy; supply chains and resilience; clean energy and decarbonisation and; tax and anti-corruption.[27] The first three have a heavy emphasis on technology.

The modernisation of the US military has been given due importance with a focus on the joint force which is "lethal, resilient, sustainable, survivable, agile and

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[20] " **FACT SHEET: CHIPS and Science Act Will Lower Costs, Create Jobs, Strengthen Supply Chains, and Counter China"**, n. 10.

[21] **"National Security Strategy"**, n. 1, p. 15.

[22] C. Todd Lopez, **"Integrated Deterrence at Center of Upcoming National Defense Strategy"**, U.S. Department of Defense, 4 March 2022.

[23] B. Jensen and J. Pashkewitz, **"Mosaic Warfare: Small and Scalable are Beautiful"**, *War on the Rocks*, 23 December 2019.

[24] C. Todd Lopez, **"Defense Secretary Says 'Integrated Deterrence' Is Cornerstone of U.S. Defense"**, U.S. Department of Defense, 30 April 2021.

[25] S.J.F. Jr., **"'A Perfect Harmony of Intense Violence': Army Chief Milley on Future War"**, *Breaking Defense*, 9 October 2018.

[26] J.R. Allen and A. Husain, **"On Hyperwar"**, U.S. Naval Institute, July 2017.

[27] **"Ministerial Statements for the Four IPEF Pillars: Trade; Supply Chains; Clean Economy; and Fair Economy"**, U.S. Embassy & Consulates in Indonesia, 9 September 2022.

responsive".[28] Both threats and opportunities are present in emerging technologies and their utilisation by the US military. Some of them are cyber, space, "missile defeat capabilities", trusted AI and quantum computing system.[29] The US faces challenges, especially against China's hypersonic missiles and the Fractional Orbital Bombardment System (FOBS).[30] The US–EU TTC may form the substrate for removing barriers between partners and allies in collaborating on issues related to joint capabilities and protecting the American military-technological edge.

Finally Section III of the NSS, 'Our Global Priorities' calls for interlinked lines of effort to counter the challenges detailed in Section I, specifically constraining Russia and outcompeting China.[31] The NSS also spells out that the next 10 years may prove to be decisive,[32] given that Xi has doubled down on modernising the PLA in the short term, i.e. 2027, as a precursor to a more expansive plan eight years later in 2035.[33] American export controls related specifically to semiconductors have become narrower and more stringent and targeted against China[34], since the informatised and intelligentised versions of PLA's warfighting are dependent on the use of AI, 5G, IoT and other data-dominant modes and applications.

There is also an acknowledgement that the Indo-Pacific may be the next arena for this competition to play out and there is a provision, at least ideally, that partner countries in the Indo-Pacific need to be supported and their economic and developmental needs met to improve their resilience against Chinese coercion.[35] The US intends to partner with industry and governments for shaping technological standards for global interoperability. This again underpins the need for the US to retain its top position since it is the only way it will be able to ensure that the technological standards set by it in CET will be adhered to by the rest of the world, also giving its corporate sector a 'prime mover advantage' in these new and critical technologies.

The NSS for the first time designates a National Strategy for Countering Domestic Terrorism, a call to action after the shocking events of the 6 January Capitol Hill

[28] **"National Security Strategy"**, n. 1, p. 21.

[29] Ibid.

[30] T. Hitchens, **"It's a FOBS, Space Force's Saltzman confirms amid Chinese weapons test confusion"**, *Breaking Defense*, 29 November 2021.

[31] **"National Security Strategy"**, n. 1, p. 23.

[32] Ibid., p. 24.

[33] B. Hart, **"Bad Idea: Conflating Chinese Military Modernization Goals with a Timeline for Compelling Taiwan"**, *Defense360*, 21 December 2021.

[34] J. Schneider and I. Zhang, **"New Chip Export Controls and the Sullivan Tech Doctrine with Kevin Wolf"**, ChinaTalk, 11 October 2022.

[35] **"National Security Strategy"**, n. 1, p. 24.

insurrection.[36] Technology here plays a major role since the NSS implies using the assistance of Big Tech to address violent extremist content online as well as tracking and monitoring domestic violent extremist threats in real-time using a data-driven approach and the use of new mechanisms such as apps.[37] The most unique component of this document is the posturing of technology as a panacea for all strategic and survival challenges and the US as a rule-setting entity since 1945. The intertwining of the two is what makes this entire document interesting.

For the US to unravel these entangled threads using only a militarised perspective will be tough—one of the reasons why Integrated Deterrence has been introduced formally in this document. This, like many of Xi's doctrines and projects, remains amorphous and devoid of any real content but is likely to go through several iterations and hits-and-misses before a concrete strategy is formed. One may even assume that the current round of export controls aimed at the Chinese semiconductor industry is a part of Integrated Deterrence. It remains to be seen, however, how the remaining components, especially the partners and allies, play up.

In Section IV called 'Our Strategy by Region', the US calls India a Major Defence Partner and aims to work with the country, bilaterally and multilaterally, to support a shared vision of the Indo-Pacific. Seeking to sustain the necessity for the North Atlantic Treaty Organization (NATO) beyond counter-terrorism and Russia and making NATO a part of its Integrated Deterrence strategy, the US has added climate change, China and cyberspace as add-on threats.[38] All three will require a heavy investment in new and emerging technologies and standard-setting. A free and open Indo-Pacific forms the crux of the fourth part and for this, the US counts on its five regional treaty alliances as well as partnerships with major countries.[39]

NATO's expansive approach to security encompassing climate change, cyber warfare and China along with the Quad and AUKUS point to a convergence amongst major democracies around the world on the trajectory of development of these new technologies, along with their standards. Complementary bodies such as the budding CHIP 4 alliance[40] and the Global Partnership on AI (GPAI)[41] will add technological expertise to this techno-political system, given that it will necessarily exclude certain countries.

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[36] Ibid., p. 16.

[37] Ibid., p. 37.

[38] Ibid., p. 38.

[39] Ibid.

[40] E. Na, **"South Korea caught in the middle of US-China chip war, but American export control requests unlikely"**, *South China Morning Post*, 14 November 2022.

[41] **"GPAI Summit 2022 to be Held in Japan"**, Ministry of Economy, Trade and Industry, Japan.

The seriousness with which the US views the continuation of its predominant position in CET is visible from the way the US State Department has designated a special envoy for CET, created a new bureau for cyberspace and digital policy, refocused efforts of its intelligence community to incorporate open-source intelligence (OSINT) into its efforts, reorganised the Office of the Under Secretary of Defense for Policy to focus on prioritising CET and finally, elevated the White House Office of S&T Policy to a cabinet-level agency and full member of the National Security Council. [42] Policymaking has been supplemented by incentivising education, training, recruitment and retention of a STEM workforce. This is one area where the US lags behind China and needs to catch up quickly.[43]

Xi Jinping's Work Report to the 20th National Congress

One of the first implicit mentions of technology in the Work Report is in the first para itself, where Xi talks of great efforts dedicated to modernising China's national defence and Armed Forces. [44] He also mentions, in the same breath, "external attempts" to blackmail, contain, blockade and exert maximum pressure on China.[45] This is possibly a reference to the export controls announced by Biden, in the run-up to the 20th Congress. China's vulnerability in semiconductors is well-known and documented. As per Xi, it amounts to 'technological vassaldom'[46], especially in a category of technologies such as AI, quantum and 5G communication, which are essential both for the military and economy.

The report further states that efforts to build reliance on S&T have been accelerated with the influx of funds by the state increasing from one trillion yuan to 2.8 trillion yuan[47], allegedly the second highest in the world. China also possesses the largest cohort of R&D personnel in the world, something which even the US has acknowledged, though in comparative terms. The report mentions breakthroughs in core technologies in key fields such as manned spaceflight, lunar and martian exploration, deep sea and deep earth probes, supercomputers, satellite navigation, quantum information, nuclear power technology and bio-medicine.[48] The PLA has

[42] **"National Security Strategy"**, n. 1, p. 46.

[43] M. T. Nietzel, **"U.S. Universities Fall Further Behind China in Production of STEM PhDs"**, *Forbes*, 7 August 2021.

[44] **"Full Text of the Report to the 20th National Congress of the Communist Party of China"**, n. 2, p. 2.

[45] Ibid., p. 3.

[46] J. Schneider, **"Export Controls, Xi's S&T Dreams, and 'Technological Vassaldom'"**, *ChinaTalk*, 15 October 2022.

[47] **"Full Text of the Report to the 20th National Congress of the Communist Party of China"**, n. 2, p. 7.

[48] Ibid., p. 7.

been strengthened for the 'new era', with combat effectiveness as the sole criterion for professionalism. "New system, New Structure, New Configuration, New Look" is the mantra now for the PLA.[49]

The report also candidly acknowledges challenges and shortcomings in China's approach and efforts in S&T. First and foremost is that China's capacity for S&T innovation is not strong enough.[50] This brings to mind the concept of 'gold-plated innovation' introduced by Tai Ming Cheung,[51] where he distinguishes the military innovation models between the US and like-minded militaries and the Chinese PLA. While the US and other high-end militaries believe in 'gold-plated innovation', i.e., pursuing next-gen technologies and capabilities irrespective of all other considerations such as affordability, suitability to end-user needs and development schedules, China's defence acquisition system believes in the "good enough" model where defence S&T development has to be quicker, cheaper and able to be produced in great volume. This is likely to undergo a change, with the Chinese President exhorting the PLA to undergo a radical transformation in quality, in effect emulating the gold-plated innovation model, but with Chinese characteristics. Similar to the US's new Integrated Deterrence approach, the Chinese 'techno-security' state believes in a seamless fusion across the civilian and national security spectrum.[52]

The second challenge facing China's innovation and S&T ecosystem is the availability of reliable and secure food, energy and industrial supply chains. An interesting part of the report is Xi's admission that China must never close itself off to new ideas and this strictly refers to R&D in S&T, nor become ossified or mechanically imitate or absorb foreign ideas.[53] In light of the probable splitting off of technologies in the near future due to an overt and conscious connection of emerging technologies with political ideologies, this statement warrants more analysis. On one hand, China's modernisation, development and the effective control of the CCP over the Chinese state are heavily dependent on technologies whose origins lie and whose inception is still based on tools copyrighted in the West. China has no other option but to remain open. This may also imply that China, irrespective of agreements to the contrary, will use industrial espionage, lawfare and cyber operations to keep pilfering technologies from the West in the near future. On the other hand, this admission also spells caution that China does not want to face the same situation that the Soviets faced

[49] Ibid., p. 10.

[50] Ibid., p. 12.

[51] Tai Ming Cheung, *Innovate to Dominate The Rise of the Chinese Techno-Security State*, Ithaca New York: Cornell University Press, 2022.

[52] Ibid.

[53] **"Full Text of the Report to the 20th National Congress of the Communist Party of China"**, n. 2, p. 16.

when they resorted to a 'copy it' strategy[54] to keep up with American innovation, know-how and manufacturing practices in semiconductors. Overspending on innovation was one of the reasons for the downfall of the USSR.

As per the Report, the central task of the CCP is to realise the second centenary goal of building China into a "great modern socialist country" in all respects and to advance the "rejuvenation of the Chinese nation on all fronts through a Chinese path to modernisation".[55] One of the sub-components of this goal is harmony between humanity and nature. This refers to China's massive attempts at combating climate change through the use of CET. All this specifically requires AI-enabled models for discovering new materials, and promotion of greener alternatives such as energy storage systems, EVs, modular nuclear power plants, etc. For this, it is essential that China retains access to certain technologies in the future. The downside of this continued access for China is that these technologies are dual-use by their very nature. The same AI chip that is used in weather simulation can be used for hypersonic missile simulators.[56] With the PLA focusing on informatised and later intelligentised warfare, it is difficult to decouple the two agendas: planetary survival and increased belligerence of the Chinese military machine.

Are export controls the way forward to ensure that the Chinese S&T ecosystem remains crippled, or at least lags the US by a generation or two? Going by historic examples, the current system of export controls may halt Chinese S&T competitiveness but will not be able to destroy it completely. In the case of semiconductors, with the end of Moore's law in sight, companies are going in for innovation in packaging, assembly and researching new materials to extract increasing processing power from ever-decreasing node sizes.[57] However, once the node size limit is reached, it is only the innovations in peripherals which will define the processors for tomorrow, unless a totally different architecture or material is defined. In that case, the playing ground is level for all sides and the best innovation ecosystem, along with a larger market, is likely to set the beat for the future.

China's overall development objectives for 2035 are to significantly increase economic strength, S&T capability and comprehensive national power (CNP), strengthen the national security system and achieve basic modernisation of national

[54] Chris Miller, *Chip War: The Fight for the World's Most Critical Technology*, New York: Simon & Schuster, Limited, October 2022.

[55] **"Full Text of the Report to the 20th National Congress of the Communist Party of China"**, n. 2, p. 18.

[56] Cate Cadell and Ellen Nakashima, **"American Technology Boosts China's Hypersonic Missile Program"**, *The Washington Post*, 17 October 2022.

[57] T. Mann, **"Intel Bets on Packaging to Keep Moore's Law on Life Support"**, The Register, 28 September 2022.

defence and the Armed Forces.[58] This will lead to the 2050 goal of making China a modern socialist country that leads the world in terms of CNP and international influence.

Xi cautions that the current period is replete with opportunities and challenges as well as unforeseen factors in the form of Black Swan and Grey Rhino events.[59] While the Black Swan refers to unforeseen events such as the ongoing Covid-19 pandemic, a Grey Rhino event (one which is highly probable and high impact but is yet neglected)[60] will likely refer to a US involvement in China's reunification attempts with Taiwan or very least, a crippling of China's technological prowess in the short and medium term, the time window coinciding with the intended fruition of PLA's modernisation and invasion of Taiwan.

China also intends to pursue high-quality development in solid material and technological foundations, a symbiotic convergence of which is required for China's increase in CNP as well as combating environmental challenges. China also aims to deepen supply-side structural reforms and aim to eliminate excess capacities in the manufacturing sector. For this, a move to resilient and secure supply chains and a resort to using increasingly sophisticated technologies for increasing effectiveness and efficiency is critical. Increased use of computer vision, robotics and material management using AI are some of the more critical technologies that China will try and make use of for the reforms. As a result, it is imperative that China remains part of the global CET supply chain. However, the emergent groupings of nations that have a hold on the building blocks of these technologies seem to be exclusionary in nature and are based on political ideologies, liberal-democratic in nature.

The digitisation of the Chinese economy undergirds a move away from the dollar as a global reserve currency and increasing competitiveness in its manufacturing and industrial processes with the ongoing Russia–Ukraine war catalysed "poly-crisis".[61] The Report enumerates a number of steps to improve the innovation ecosystem within China, including, ironically, by strengthening IP rights system; increasing S&T exchanges with other countries and; promoting MSME technological enterprises, among others.[62]

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[58] **"Full Text of the Report to the 20th National Congress of the Communist Party of China"**, n. 2, p. 20.

[59] Ibid., p. 21.

[60] M. Wucker, *The Gray Rhino: How to Recognize and Act on the Obvious Dangers We Ignore*, New York: St. Martin's Press, 2016.

[61] A. Tooze, **"Chartbook #130 Defining Polycrisis - from Crisis Pictures to the Crisis Matrix"**, Chartbook, 24 June 2022.

[62] **"Full Text of the Report to the 20th National Congress of the Communist Party of China"**, n. 2, p. 30.

Modernising China's national security system and capacity forms one of the major tasks of the CCP. While the people's security is the ultimate goal and political security is a fundamental task, the important pillars of undertaking the modernisation of national security are military, technological, cultural and social security, with international security as a support factor. This implies an inward-focused China which looks at its international relations from a utilitarian perspective, something which has been discussed in great detail by both Rafaello Pantucci[63] and Antara Ghoshal Singh[64] in the context of Central Asia and Tibet respectively.

The Work Report also calls for improvements to be made in the legal, strategic and policy systems for national security and risk monitoring, the use of facial recognition technologies (FRT) and AI in surveillance and early warning systems and national emergency management systems.[65] China also intends to strengthen its mechanisms for countering foreign sanctions, interference and long-arm jurisdiction.

Xi has also promoted the creation of a Fengqiao model for community-level governance which theoretically is to "boost public participation in crime prevention" but is essentially a grassroots surveillance programme. A benign form of this, Prevent, was attempted by the UK government as part of their counter-radicalisation efforts but failed miserably.

Technology, though not mentioned explicitly so much, is present in every line and paragraph of the section dealing with the PLA. The development of the military is envisaged through mechanisation, informatisation and application of smart technologies. Like the US's Integrated Deterrence, a new system of strategic deterrence is planned to be established, where the proportion of "new-domain" forces with new combat capability will be increased, the development of new unmanned systems and intelligent combat capabilities will be sped up, and finally, the development of a network information system is planned to be coordinated.[66] There is a renewed emphasis on conducting joint operations supported by electronic warfare (EW), battlefield support systems and an integrated logistics system. The PLA, which has not fought a war since 1979, has to depend on technology for simulations and war gaming for some semblance of a combat experience.[67]

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[63] R. Pantucci and A. Petersen, *Sinostan: China's Inadvertent Empire*, Oxford: Oxford University Press USA – OSO, 2022.

[64] Antara Ghosal Singh, **"In China's Own Words: An Analysis of Chinese Strategic Discourse on Tibet"**, Occasional Paper No. 370, Observer Research Foundation, October 2022.

[65] **"Full Text of the Report to the 20th National Congress of the Communist Party of China"**, n. 2, p. 46.

[66] Ibid., p. 48.

[67] E. Kania, **"Learning Without Fighting: New Developments in PLA Artificial Intelligence War-Gaming"**, China Brief, Vol. 19, No. 7, 9 April 2019.

Xi, in the report, visualises the speeding up the translation of S&T advances into combat capability—what is meant by the author's interpretation of 'Gold Plated innovation with Chinese characteristics', i.e., investment into S&T R&D with a view towards creating specific combat capabilities and not just for basic research.[68]

Implications for India

Despite the vast difference between the political systems of the US and China, their approach towards technology adoption, and means to stay ahead of each other in the great power competition, are remarkably similar. Both the US and China, have placed CET as the cornerstone of their respective foreign, economic and cultural policies. This has, in effect, created the likelihood of two opposing techno-political systems with Europe, the US and most likely Japan and South Korea on one side and China and Russia on the other side. The rest of the world is up for grabs, digitally.

Since most standards and protocols for CET are being defined, practised and honed in militarised groupings such as AUKUS and NATO, it is natural that these will be exclusionary in nature. Combined with the export restrictions on China and resultantly, Russia on advanced semiconductors and technologies, there is a strong likelihood that developing countries or states dependent on the import of technology are likely to face a major choice in selecting between two systems.

For countries with an independent foreign policy such as India, it will be difficult to navigate both camps at the same time, since the Chinese camp will inevitably also include Russia. India has steered clear of sticking to the tenets of any one country and is pursuing a policy of technological self-reliance in the form of 'Atmanirbhar Bharat'. The building blocks of CET, including the standard-setting bodies, are still in the hands of other countries, especially the US. As with the case of SWIFT, where Russian financial and trade entities were disbarred from accessing the system for the transfer of funds[69], there will always remain an apprehension that these so-called autonomous or decentralised bodies will always be subject to the diplomatic coercion of the world's strongest countries.[70] As a result, it is more advantageous to come up with a third, open-source alternative.

More specifically, the NSS calls for constraining Russia's strategic and economic sectors including defence and aerospace. Russian armaments are heavily dependent on US and European-supplied semiconductors. This Russian dependence will have

[68] K. Huang, **"PLA Recruitment Relaxes Age Limits, Focuses on Stem Skills"**, *South China Morning Post*, 13 August 2022.

[69] P. Blenkinsop, **"EU Bars 7 Russian Banks from SWIFT, But Spares those in Energy"**, Reuters, 3 March 2022.

[70] H. Farrell and A.L. Newman, **"Weaponized Interdependence: How Global Economic Networks Shape State Coercion"**, n. 11.

a major impact on India since several Indian platforms depend to a great extent on Russian technology and self-reliance will take some time to create indigenous capabilities.

The main challenge though, of two opposing and highly incompatible techno-political systems, is likely to manifest in the next decade. If this happens, the world will be carved out into two groupings, not unlike the ideological camps of the Cold War. This time, however, communication and trade between these camps are likely to be zero due to incompatible technological and technical standards. Countries outside these camps must then choose between either of these technical standards and in effect, proclaim their political ideology too. Foreign policies of these countries will inevitably be yoked to the respective camps' ideologies.

In order to avoid this scenario from being played out in real-time, it is up to countries like India which have a decidedly independent foreign policy as well as an international repute of being an effective mediator, to either create bridging pathways to both emerging camps or create alternatives or a third option for open-source protocols. Any technical protocol requires both a huge market and the clout of the promoting country to become dominant. India is slated to become a one trillion dollar digital economy by 2025 and has committed to reaching electronics manufacturing exports of US$ 300 billion by 2025–26.

With a projected year-on-year (YoY) growth of 7 per cent[71], India is likely to be one of the biggest electronics markets in the world, both from an export and consumption point of view. Being a simultaneous member of the Quad, Shanghai Cooperation Organisation (SCO) and the BRICS as well as the ASEAN Regional Forum (ARF), Goodwill Partner at G7 and now holding the Chair of the G20 for the next year, India is well poised to act as a bridging partner to introduce and operationalise policies that may result in certain minimal digital commonalities so that the carving up of techno-political camps does not take place. In a worst case scenario, India can help create open source technical systems, backed up by the heft of its market that may be adopted by countries unwilling to toe a particular political line and yet not compromise on their developmental priorities.

[71] Rohan Thomas Abraham, **"Electronic Systems"**, Invest India.

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