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Article Title

Role of Emerging Technologies in the Indo-Pacific: An Assessment of the Quadrilateral Security Initiative and AUKUS

Abstract

The Indo-Pacific region has emerged as the epicenter of the geopolitical rivalry between the US and China. The race for developing critical emerging technologies has arisen as the latest frontier of this competition with far-reaching implications for regional and international security. This paper asserts that the US and its allies are harnessing the power of emerging technologies especially Artificial Intelligence to strengthen their collective defences under the aegis of the QUAD and AUKUS. Applying the defensive neo-realist lens, this study underscores the burgeoning collaborations between QUAD and AUKUS members while restricting China's access to supply chains of semiconductor chips to prevent it from challenging US global supremacy. The findings contend that while the US and China are leading in the AI-economic realm, assimilation of AI into military capabilities could potentially intensify armed conflicts. Furthermore, exporting varying technological standards to other states may create distinct and contending spheres of influence globally.

Keywords: Indo-Pacific Region, Emerging Technologies, QUAD and AUKUS

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Global Political Review

Title

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Contents

Abstract

The Indo-Pacific region has emerged as the epicenter of the geopolitical rivalry between the US and China. The race for developing critical emerging technologies has arisen as the latest frontier of this competition with far-reaching implications for regional and international security. This paper asserts that the US and its allies are harnessing the power of emerging technologies especially Artificial Intelligence to strengthen their collective defences under the aegis of the QUAD and AUKUS. Applying the defensive neo-realist lens, this study underscores the burgeoning collaborations between QUAD and AUKUS members while restricting China's access to supply chains of semiconductor chips to prevent it from challenging US global supremacy. The findings contend that while the US and China are leading in the AI-economic realm, assimilation of AI into military capabilities could potentially intensify armed conflicts. Furthermore, exporting varying technological standards to other states may create distinct and contending spheres of influence globally.

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Introduction

Rapid advances in emerging technologies have intensified competition between leading world players creating an increasingly volatile environment for international security. If the most consequential development of the 20th century was the advent of nuclear weapons, the 21st century will be the age of emerging technologies especially those that are dominating the defense sectors with far-reaching implications for an evolving balance of power. AI will drastically affect military strategy, impact international power balances, and intensify

strategic rivalries amongst great powers. States possessing the latest innovations in AI will possess capabilities that will enable them to acquire vivid strategic advantages over their opponents in decision-making, military purposes, intelligence gathering, and domain awareness among a host of other activities.

AI-generated autonomous systems have the potential for destabilization in an already volatile environment within the Indo-Pacific region with potentially far-reaching consequences for regional and international security. More so, the linkages between AI-generated systems and cyber security are becoming increasingly interdependent and critically acute in both defense and commercially led initiatives. Cyber-espionage can lead to remote intelligence gathering, data collection, hacking, and disruption leading to a frenzied halting of all activities that are dependent on technological innovation such as communication systems, auto-pilot planes, self-driving cars, power-grids, industrial units, and even nuclear reactors. Consequently, states that do not adapt quickly to emerging developments will be vulnerable to AI warfare and cyber security threats. According to defensive realism, the primary motivation for states in an anarchic international system is to ensure their security. As AI has emerged as a critical factor that could tilt the equilibrium between the US and China and potentially undermine the other's security, the ensuing security dilemma has compelled the rival states to keep up with AI advancements and avoid strategic inferiority.

In the first section, the paper makes an assessment of the dynamics of strategic competition underway within the Indo-Pacific region with an emphasis on the role of the patterns of cooperation between Quad members. Major initiatives harnessing the potential of AI to advance their collective growth and national security objectives are assessed followed by an assessment of the strengths and challenges to AI-related collaborations amongst the Quad members. The second section of the paper focuses on AUKUS; a triparty arrangement between Australia, the UK, and the US that hinges on close security cooperation based on two major pillars. The first involves providing nuclear submarines to Australia to bolster its maritime security and the second pillar which focuses on cooperation on emerging technologies.

The paper analyzes the improvements in submarine technology and design aimed at strengthening its stealth features while conversely highlighting the role of emerging technologies for advanced detection systems limiting the submersibles of strategic leverage. Towards the end, the paper analyzes the military, economic, and political implications of the emerging technologies race and how it could shape the geo-political future of the world.

Quadrilateral Security Dialogue: Agenda and Strategic Milestones

When the US announced the Indo-Pacific Strategy, it underscored the expansion of US objectives with an emphasis on broader engagement with the region, capacity building for US allies and partners, and fostering mutual collaborations between like-minded states largely aimed at offsetting China's deepening clout in the region. During the first term in Office, President Trump's Free and Open Indo-Pacific strategy (FOIP) was made a cornerstone of the US approach towards the region. The National Security Strategy, 2017, and the Department of Defense Indo-Pacific Strategy Report, 2019 highlighted the key elements of this approach including strengthening military ties with partners and allies, boosting economic partnership through bilateral arrangements, and pushing against China's growing assertiveness through collective responses.

An assessment of the Biden-Harris strategy indicates a continuation and expansion of the FOIP approach laid down by the Trump Administration. Several milestones have been accomplished including revitalizing and renewing alliances and partnerships such as with the Philippines and Vietnam, broadening the scope of mutual collaboration with partners such as India, establishing trilateral and quadrilateral security coalitions, and outreach to the island states in the Pacific under the Partners in Blue Pacific initiative. Two major initiatives of the strategy that are particularly notable include the Quadrilateral Security Initiative and AUKUS.

The Quadrilateral Security Dialogue roots back to 2004 when the four states including the United States, Australia, India, and Japan joined forces to offer a collective response to the Indian Ocean and tsunami which indicated the potential for member states to come together and coordinate in the future

(Heiduk & Wirth, 2023). However, due to fears of a backlash from China, commitments of partner states were found lacking. Additionally, after Japanese Prime Minister Shinzo Abe left office, Tokyo's response became tepid as Abe was the driving force behind the Quad initiative. Australia's new government Kevin Rudd also did not want to antagonize China and refused to become part of a coalition. India for its part was ambivalent about its membership in the group complicated by Australia's refusal to sell Uranium to the South Asian country and the US focused its attention on other regional forums thereby contributing to the dormancy of the group for almost a decade (Heiduk & Wirth, 2023).

The dialogue was resumed in 2017 owing to the increase in assertive actions by China. Momentum began to grow in 2019 when meetings were upgraded to the ministerial level (Mohan & Govella, 2022). In March 2021, the first Quad leader's summit was hosted by the US, and for the first time, three committees were set up to promote partnerships on vaccines, climate, and critical and emerging technologies. Subsequently, in September of the same year, another three committees on cyber, space, and infrastructure were also set up. In June 2022, meetings were elevated to Head of State level on the occasion of the US-ASEAN summit in Washington wherein all ASEAN member states were welcomed in unison to the US for the first time in its 45-year history demonstrating the impetus in the overall US strategy for the region (Press Trust of India, 2022). Subsequently, in 2023, the Quad Leader's Summit took place in Tokyo, Japan where the state leaders took initiatives involving cooperation in diverse fields and issued joint principles for secure software and cybersecurity of critical infrastructure (Luthra, 2023). Leaders of the Quad states met again in Delaware, US in 2025 and launched the Maritime Initiative for Training in the Indo-Pacific (MAITRI) to enhance maritime awareness, signed a Semiconductor Supply Chains Contingency Network to strengthen the resilience of semiconductor supply chains, and agreed on joint principles for promoting an inclusive, open, and secure digital future (Bhandari, 2025).

AI Collaborations and Cyber Security in QUAD

All the members of the Quad are committed to establishing strong foundations for collaboration on issues about Artificial Intelligence and cyber security as an alternative to what they consider 'the unethical deployment of AI for surveillance and suppression' (Chahal, 2022). They share convergences in terms of complementary capabilities that could contribute to the development of technological assets for all. All member states of the Quad were ranked amongst the leading ten states generating AI research during the decade from 2010 to 2020. Together the four states produce more research related to AI than the twenty-seven member states of the EU and ten states of ASEAN combined. However, the areas in which they are leading remain distinct highlighting the strengths of individual member states (Chahal, 2022).

The Quad partners have continually emphasized their resolve to promote AI exploration via various mechanisms such as increased investments in research, enhancements to data infrastructures, and extension of the computing resources required for AI development. Additionally, the culture of openness regarding resource and knowledge sharing has been beneficial to all the Quad members. To expand cooperation between the Quad members and jointly undertake innovative initiatives, several initiatives have been introduced that seek to address the gaps and strengthen collective capabilities. In particular, Quad's work has been centered on four pillars including the agreement on "technical standards, 5G diversification and deployment, horizon-scanning, and technology supply chains" (White House, 2021). Towards these goals, the partners agreed to sign an MoU on 5G Diversification and Open RAN and to leverage their collective strengths in ensuring "a diverse and competitive market for semiconductors" (Rajagopalan, 2022). They also embarked on a plan to launch an ambitious semiconductor supply chain initiative. The quest is to identify individual capacities, ascertain weaknesses, and reinforce supply-chain safety. This will assist the establishment of a diversified market that generates protected critical technologies. Concurrently there are efforts underway by the group to restrict China's access to the global semiconductor supply chain. In a major development likened to the renewal of the industrial policy in the US, Former President Biden initiated the CHIPS and Science Act with the aim to not only promote domestic production but also to move supply chains back to the US (Benson et al.,

2023). The major purpose of the act is to harness American semiconductor manufacturing abilities while also restricting support to Chinese researchers and companies and countries of concern for the United States including Russia, Iran, and North Korea. The US administration imposed controls over foreign supply chains on October 7, 2023, in a concerted effort to restrict China's technological growth while harnessing durable supply chains between U.S. partners (Benson et al., 2023).

Strengths for Collaboration between Quad Members

1. Flexibility in Terms of Quad Structure: The Quad remains, to this point, a semi-formal coalition of states with vested interests in maintaining the regional balance of power within the Indo-Pacific region. While increased momentum within the Quad was observed after 2017, the member states had already established bilateral relations and were participants in various multilateral arrangements. The alignment of their economic, political, and strategic goals further solidifies the rationale for their collaborative efforts. Additionally, it is noteworthy that despite the US having longstanding alliances with Japan and Australia, India, guided by its strategic autonomy, has historically steered clear of formal alliances. Therefore, the loose and flexible structure of the Quad provides greater appeal for India to engage without being bound by a formal alliance.

2. Distinct and Complementary Strengths of Members: Quad's major strength lies in its ability to foster collaboration between four nations leading in AI and cyber security that have varied but complementary capabilities. Such an arrangement allows participating states to capitalize on the unique strengths of each member state, reducing redundancy and fueling innovation thereby maximizing their collective gains. Each member state can bring forth its expertise for the shared advantage of the coalition. The US is invested across all AI domains, especially chip manufacturing, research, and development. Japan is a leading force in robotics and automation, Australia has a skilled workforce and vibrant startup ecosystem while India has substantial data

resources and a thriving IT industry. The Quad therefore has vast potential to serve as a platform for like-minded states with shared goals to explore new avenues in AI development and innovation.

3. Addressing China's AI Dominance: Strategies for Balance A major goal of the Quad agenda is to jointly address the challenges emanating from China's rapid ascendance in AI fields. Quad members seek to counter China's dominance and export surveillance technologies that could potentially be used to monitor and gather data for control and repression of populations. With the introduction of the 'New Generation AI Development Plan" in 2017 the Chinese government outlined its targets in terms of AI development. By 2030 the East Asian state aimed to establish the country as a Global AI leader. Given China's dual use of technologies and its extensive Belt and Road Initiative, the US and its allies fear that they could be losing against China's rapidly growing technological strides in AI which could in the long term set global technological standards contrary to US preferences. To curtail China's progress the US and its allies have embarked on a path to undertake measures that would in effect restrict Chinese growth including tight control over investments in Chinese core technologies, careful examination of educational exchanges and collaborations, cracking down on Chinese espionage activities, disrupting ICT supply chains, and simultaneously increasing collaborations between QUAD members to surpass Chinese achievements.

Challenges and Obstacles

Despite the scope of cooperation between the Quad members for collaborative AI development, substantial obstacles remain to attaining the shared objectives of the Quad agenda.

1. Barriers to National Data Sharing: Regulatory restrictions and unease in terms of sharing national data with member states owing to national security concerns are some of the major obstacles to collaborative efforts in terms of AI development. India in particular has been a case in point. India's foreign policy

prioritizes independence, particularly in sensitive areas like defense and national security. As such, it may choose to limit data sharing with QUAD members to maintain control over sensitive information and protect its strategic interests. Such an approach prioritizes sensitive data to be securely stored within national confines and attempts to exclude the possibility of unauthorized access by other states. For the same reason, India has adopted a guarded approach to entering into data-sharing agreements with Quad members.

2. Concerns with Strategic Autonomy: India's long-term goals center on its rise as a leading power in the international system. For that reason maintaining close coordination with QUAD members is essential to meeting its resourcing needs however, India does not wish to be staunchly aligned with any one coalition that limits its strategic autonomy. On the contrary, the country has sought to diversify its foreign relations gaining strategic leverage wherever it advances its national interest. There are qualms about India's commitment to the Quad and its insistence on maintaining a corresponding, strategic partnership with Russia (Lalwani, 2014).

3. Concerns over Surveillance: There are concerns about foreign surveillance and data breaches, which could compromise national security amongst QUAD members making them vulnerable to surveillance or cyber-attacks. The upsurge in cyber security attacks is indicative of the need to build cyber resilience to avoid such incidents. According to the Australian Cyber Security Centre's 2023 Annual Threat Report, the country faced numerous data fissures, which led to the leak and theft of millions of Australian information on the dark web" (Australian Signals Directorate, 2023).

4. Economic Engagements and AI Investments with China: Robust economic ties with China have obstructed the Quad's agenda in the past, however, trends are now changing. While the US remains the leading partner in terms of joint research and collaboration with each of the other members of the Quad, the remaining three member states do not cooperate as comprehensively with each other. On the contrary, their research collaboration in terms of AI with China is only second to the US indicating comparatively lower levels of AI tech collaboration between India, Japan, and Australia. Also in terms of investments, the flow of AI investment is greater between the US and China than with any of the other states although that trend seems to have been declining since 2017 (ASD, 2023). In addition to this, the US-China trade experienced an 11.6 percent year-on-year decline in 2023 with bilateral trade falling to $664 billion. The decrease comes in the wake of "US restrictions on the Chinese high-tech industry. This represents the first downturn in trade between the U.S. and China since 2019. On the contrary, China's trade with Russia peaked at more than $240 billion, indicating a year-on-year increase of 26.3 percent (Presse, 2024).

AUKUS and QUAD: Complementary Roles and Differing Dynamics

Building on QUAD's initiatives, the US, UK, and Australia established AUKUS in 2021. QUAD and AUKUS are distinct strategic arrangements comprising the key Indo-Pacific powers, with the US and Australia being members of both these groupings. The major aim of AUKUS aligns with QUAD i.e. to address concerns emanating from China's growing prowess within the region by establishing multilateral arrangements that focus on collective capacity building. However, there are key differences as well in terms of structure, scope, and focus. The structure of the QUAD is flexible to account for the differing strategic approaches of its members with varying degrees of commitment to mitigate China's influence. In contrast to the QUAD coalition which has a broader agenda, AUKUS is an alliance aimed at strengthening deterrence against China's naval power in the Indo-Pacific region. PLAN's growing assertiveness with regards to claims in the South China Sea and the East China Sea have heightened apprehensions among regional states and Australia has been no exception in this case. The agreement entails two major pillars; the first pillar of the trilateral arrangement calls for the US and the UK to assist Australia in acquiring nuclear-powered submarines. The initiative is considered the 'single biggest leap in terms of Australia's defense capabilities' (Crowe, 2023). Whereas the second pillar focuses on cooperation in emerging

technologies such as AI and cyber warfare. In this respect, AI and cyber security cooperation is a common agenda for cooperation in QUAD and AUKUS, with the eventual aim of establishing a stable Indo-Pacific order.

Pillar I of AUKUS: Nuclear Submarine Technology

Nuclear-powered submarines are possessed by only a handful of states including the US, the UK, Russia, China, France, and India. The initiative would make Australia the seventh only such state to possess such a capability in the world. The exception however is Brazil which aims to commission the *Álvaro Alberto* in the early 2030s in its naval fleet, making Brazil a competitor to Australia in the category of the first non-nuclear weapon state to deploy a nuclear-powered submarine (Congressional Research Service, 2022).

Possessing nuclear-powered submarines confers a strategic advantage on the state owning the submersible by allowing the completion of the nuclear triad. However, this is a tremendously expensive capability with the estimated cost of a Virginia Class nuclear-powered submarine priced at around $2.8 billion without the Virginia Payload Module and with the VPM estimated at around $ 3.2 billion each (CRS, 2019). States such as Pakistan have opted out of such an option instead, relying on diesel-powered submarines mounted with nuclear warheads to ensure the viability of their nuclear deterrence. However, this comes with its own set of shortcomings. The diesel-powered submarines need to resurface for refueling purposes, thereby undermining the primary function of a submarine i.e. to maintain stealth. Advances in AI specifically concerning surveillance and reconnaissance make it easier to detect diesel-powered submarines. Such a development that advances the prospects of detection advertently also carries serious implications for the nuclear deterrence strategy.

Under the AUKUS agreement, the submarines will be built using American technology in the UK and Australia. As it is the first time the US has shared this technology with any state other than the UK in the past six decades, it holds immense significance for observers apprehensive about the deal's potential consequences for the region's security. Under the terms of the deal, the nuclear-powered submarines procured by Australia will not be carrying nuclear warheads, however, they will be able to traverse long distances, remain submerged for longer periods, and owing to advanced stealth features, largely evade detection (Stacey & Sabbag, 2023).

Pillar II: Emerging Technologies and AI Detection

In the past, radars and active sonars were used for detecting conventional diesel-powered submarines but were unable to detect nuclear-powered attack submarines (Chand, 2016). Networks of Acoustic Hydrophone arrays mounted to the sea floor were nonetheless able to detect to a limited extent the SNNs. However, according to studies by the Australian National University, advancements in surveillance and detection owing to rapid developments in emerging technologies may lead to situations where delusion to detection may no longer be possible by as early as 2050 (Bradbury et al., 2023).

The former Deputy Secretary General of NATO Rose Gottemoeller, is of the view that as new technologies reach advanced stages of development, they will have the potential to overturn the balance between stealth and detection making the furtiveness of submarines extremely difficult in the future (Bajema, 2022). Previously, the US has employed methods such as Lidar and Magnetic Anomaly Detection (MAD) which is aimed at monitoring the earth's magnetic fields and has the potential to identify commotions that may be caused by the metal hull of the submersible (Keller, 2019). It has also explored the possibility of employing the swarming technology which comprises essentially locust drones. Likewise since 2017 China for its part has also developed and deployed underwater drones or unmanned underwater vehicles within the South China Sea. The glider drones called "Haiya" are more resilient and more energy-efficient and can promptly transmit data to the military. According to China, it has employed twelve of these drones to collect environmental data within the South China Sea (Adams, 2017).

Although China has stated that these UUVs will be used for scientific purposes, they may also be employed during military conflicts in closed spaces such as strategically vital chokepoints for reconnaissance operations (Chandran, 2022). Existing detection systems could have a far greater

potential if combined with AI mechanisms. Accessing large quantities of sensor data through continuous satellite monitoring of the Ocean's surface and strategic locations could be used along with deep learning's abilities to find patterns and baseline conditions and subsequently be compared to any new changes in the data that indicate anomalies and thereby assist in the detection of lurking submarines. In December 2023, Defence Ministers of Australia, the US, and the UK stated after Australian naval divers were injured by sonar pulses from Chinese vessels in international waters that there would be a collective initiative to deploy drones, deep space radars, and Artificial Intelligence in concord to counter China's hostility in the Pacific (Australian Associated Press, 2023).

Whereas the first pillar of AUKUS deals with the acquisition of nuclear-powered submarines by Australia, the second pillar is focused on developing advanced technologies to strengthen mutual defense capabilities directed at exploring ways and means to detect Chinese submarines. The cooperation would encompass sharing modernized and enhanced combat capabilities and emerging technology collaborations in five areas identified for synergy under the scope of the second pillar including AI, Quantum Computing, Underwater sea drones, hypersonic missiles, and electronic warfare technologies (AAP, 2023).

Common Strategic Concerns and Mutual Strengths

1. Shared Historical and Intelligence Ties: All three member states have had long-standing military and historical ties. Additionally, past cooperation related to the Five Eyes Intelligence Sharing and ANZUS treaty lays the foundation of trust and strategic coordination among AUKUS members. More so, whereas AUKUS is primarily aimed at strengthening Australia's deterrence capabilities, it does nonetheless strengthen the Western-led international security network and the US global leadership position. In this way, the partnership addresses Australia's regional security concerns emanating from China's growing dominance while simultaneously assisting in the US global strategy to restrain China's ambitions seen as detrimental to US leadership.

2. AI-based Joint Defence Collaborations: Under the AUKUS agreement, Australia is able to acquire nuclear-powered submarines and advanced emerging technologies such as AI, cyber capabilities, and hypersonic weapons, from the US and the UK thus further strengthening their collaboration in the defense sector. Besides, combined efforts are underway toward developing a concerted system of AI-driven unmanned underwater vehicles (UUVs) that are able to support the SSN fleet. Collectively these efforts would enable the allies to attain a comprehensive and accurate awareness of their maritime environment.

3. Mutual Threat Perceptions: The US, UK, and Australia also share common perceptions regarding China and the need to collaborate in order to address the ensuing circumstances. AUKUS members are collectively working to counter China's growing application of AI in defense, particularly in the maritime domain. To counter the application of AI-enabled systems developed by China, the allies are developing counter-technologies with a focus to not only strengthen their own AI-based capabilities but also to build secure systems that can defend against AI-driven cyber attacks, thereby offering a firm resistance to China's influence at sea.

Limitations

1. Global and Regional Concerns: Conversely, there are some key differences in the strategic concerns of the member states of AUKUS. The US has global concerns and seeks to address China's rise as a challenge to its established world order. The UK's major concern lies within Europe although it is also beginning to expand its presence in the Indo-Pacific region. By contrast, Australia is largely focused on the Indo-Pacific region and is directly affected by any developments that take place in the region such as an escalation of regional conflicts involving a direct standoff involving China.

2. Varied Economic Relations with China: The economic relations of each of the AUKUS members also complicate the durability of the alliance. For Australia, this matters the most as China is its biggest trading partner worth 28% of its total trade volume in 2024-25 (London

Post, 2025). Compared to Australia, the UK and the US are less reliant on China and therefore possess greater strategic flexibility. In terms of navigating their security concerns Vis-à-vis China, all three states must draw a balance between their economic ties with China and their strategic objectives.

Regional Implications of the AI Race

Military Implications: China has described the Quad as the most consequential challenge to its influence in the region referring it to an Asian NATO. Efforts by the US and its allies to utilize AI-enhanced competencies in military aspects and machine-based decision processes have serious implications for the possibility of an armed conflict in the region. The use of robotics and AI during clashes could lead to an escalation in hostilities compounded by the absence of human agency. According to an expert on AI warfare, Paul Scharre, even the most effective mechanized warfare derived from AI has the possibility of making an incorrect estimation in selecting targets for example in places where militaries operate in proximity to each other such as in the Black Sea or the South China Sea and could inadvertently lead to an escalation of the conflict (Scharre, 2025). Consequently, fully autonomous systems equipped with AI could transform the dynamics of aerial, land, and sea-based warfare with greater efficiency and speed than conventional human-operated systems but also carry substantial risks for aggravating conflicts.

Additionally, under the framework of AUKUS, expanding cooperation on joint naval capabilities and emerging technologies could have negative consequences for nuclear deterrence by disturbing the balance between stealth and detection of submarines. As states look towards employing AI-enhanced capabilities for the detection of submarines, they may be compelled to assess the viability of their strategic leverage given the high costs of acquiring the technology. Additionally, with the employability of AI in decision-making having the ability to evaluate large swathes of data, generating algorithms capable of assessing activities of rival forces, predicting possible strategies and even suggesting optimum responses, the future of warfare is likely to be dominated by swifter and more lethal military operations. In future conflicts, AI might assume an important role in the cyber warfare domains by detecting vulnerabilities in rival forces networks and information systems thereby disrupting communication systems and directing cyber-attacks at vital infrastructures. Moreover, manipulation and disruption of critical information centers could be used to generate information warfare creating misperception and disruption directed against civilian and military targets.

Given that there is no internationally agreed-upon governance framework for the use of AI in military domains at present, this raises serious ethical and legal concerns. International standards and regulations need to be established to oversee the responsible use of AI in armed conflict and reduce the risks of AI-related destabilization within the Indo-Pacific region in the backdrop of the intensifying rivalry between Quad and AUKUS members at one end and China on the opposite end.

Economic Implications: There is widespread optimism in much of the developing world regarding the potential use of AI to fast-track the process of growth and catch up with the industrialized economies. The possible uses of AI cuts across multiple domains such as banking, healthcare, agriculture, disaster mitigation, early warning systems, and smart cities that are more efficient and sustainable. However, the promise and peril of AI need to be cautiously assessed in conjunction. Owing to the extremely rapid developments and progress in the field of AI, states are ramping up their efforts to capture opportunities offered by the field. However, an ensuing rivalry has been escalating between China and the US and could lead to the creation of distinct and isolated technological spheres with shrinking space for joint cooperation in the tech sector between the two sides.

Already the US efforts to withhold China's access to semiconductor chips, scrutinizing joint AI research with Chinese researchers and companies, and efforts at establishing separate principles for technology use could have far-reaching implications for the world order. Disagreements regarding 5G standards between the US and China are indicative of the emerging rivalries to shape mobile standards in vital regions in the near future. This could lead to the possibility of divergent and non-interoperable 5G networks in overseas markets. But Quad's initiatives go beyond efforts to surpass China's ascendance in the technology sector. Cooperation

on emerging technologies will assist in shaping closer trade linkages between the four states that have a cumulative GDP of $34 trillion, while also presenting substitutes to Chinese economic domination in the region (Laskar & Bhardwaj, 2022). The US and China trade war which extends into the tech sector is strife with accusations against China of unjust trade practices. These developments could aggravate tensions between the two states and contribute to a broader context of economic rivalry. It is the Quad perception that China has used its technological heft to leverage geo-political and geo-economic gains in the region to its advantage. This has necessitated a concerted effort to develop and offer alternative technological system choices to regional states that wish to align with the US and its partners.

Ideological/Political Implications: As China and the US compete to emerge as the leaders in AI technology, there is a corresponding race for geopolitical influence driven by innovation in economic, military, and political domains. The US and its allies advocate for upholding the liberal democratic norms and criticize China's approach to AI, raising concerns about infringements on individual privacy and human rights. The US reservations regarding China's use of AI involve keeping a check on citizens' consumer habits, movements, and communications. This can lead to a system of strict monitoring and surveillance of citizen's activities, enabling authoritarian governments to lead crackdowns on public dissent thereby undermining democratic norms. As the US strives to safeguard its established liberal world order, the export of Chinese technologies and policies to other states could intensify the political/ideological divide between the two superpowers and create distinct and competing zones of influence.

Intergovernmental initiatives such as the Global Partnership on AI initially proposed by France and Canada and actively supported by the US formally launched in June 2020. The OECD hosts experts from diverse fields related to AI in order to establish the parameters for the responsible use of AI in accordance with internationally acceptable human rights and democratic values. The latest GPAI Ministerial meeting was held in New Delhi on December 14, 2023, and attended by representatives from 29 countries (Barik, 2023).

Conversely, China is also leading the way in promoting its innovations and policies in AI through the BRI. China has made considerable headway with regards to AI governing regulations This will have huge impacts not only on China's technology exports but also on international AI systems. However, these developments are viewed in the West with skepticism and often dismissed within the context of a geopolitical contest. China for its part considers its Global AI Governance Initiative launched in 2023 'open, fair and inclusive' compared to the US 'restrictive' controls over AI technology aimed at maintaining its monopoly and safeguarding its hegemony. Beijing has advocated for using the technology as a win-win approach for all states especially those that are part of the BRI and pursuing a policy of 'respect of other states sovereignty when extending AI products and services to them'(Cong & Yeping, 2023). Varying standards and dissenting views regarding the use of AI have led to disagreements between the US and China, however, the future of geopolitical supremacy will be determined by who can best harness the potential of the emerging technologies, especially AI to its advantage.

Conclusion

In cognizance of the transformative effect of AI on the global power structure, the US and China are leading the way in shaping their strategic initiatives to ensure their security and position in the international system. Whereas the US perceives that China could use its technological heft to expand its influence at the expense of the US global leadership, China views the US initiatives directed at containing its rise through restrictive policies. The ensuing rivalry is already taking shape whereby the US is strengthening its strategic relationship with allies and partners, especially within the region through multilateral arrangements such as the Quad and AUKUS. The arrangement aims to enable the sharing of expertise, resources, and talent for concerted clout in the technological domains. China could also deepen its collaborations with states that are part of its BRI Initiative and in effect contribute to the creation of independent ecosystems. This 'technological decoupling' could include the setting up of separate technology standards, delinked supply chains, and varied data ecosystems leading to the creation of parallel technological domains with little interoperability.

Given AI's role in military applications and its potency to substantially upgrade military capabilities, both states are likely to continue capitalizing on military systems such as autonomous drones, cyber warfare applications, and cutting-edge surveillance structures. Given the rapid developments taking place in AI-regulated military systems, an arms race could take place and escalate the risk of miscalculation by fully autonomous weapon systems. Likewise, both states will also compete to reap the economic benefits of the AI revolution across a wide range of fields and compete for overseas markets. They will seek to shape the international AI governance frameworks in keeping with their strategic priorities and preferred values thereby not only shaping the AI technological revolution but also determining the course of future global politics.

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