



**THE GEOTECHNOLOGICAL COMPETITION BETWEEN US
AND CHINA AS A CATALYST OF THE INDO-PACIFIC
SECURITY**

Individual work

Indo-Pacific: what strategy vis-à-vis China?

Christophe Jaffrelot

Paul Louédin

Paris School of International Affairs

SciencesPo Paris

2022

The geotechnological competition between us and China as a catalyst of the Indo-Pacific security

Taking up this theme in his book *AI 2041 Ten Visions for Our Future*, Kai Fu Lee, one of the most eminent researchers in Artificial Intelligence, notices the revolutionary potential that these technologies change our societies. The ubiquitous presence of these new technologies (N.T) creates a security issue to control them. It becomes necessary for the States or any group wishing to ensure its own security to master these technologies. As part of a global rivalry between the two, the technological competition between them is structured around the question of who will have control over advanced technologies, who will be the first to access certain information, and who will finally be able to control the world. This so-called geotechnological rivalry which is the economic potential of an innovation through rapid commercialization of the innovation, or through strategic deployment and potential weaponization of the technology (Goodman, Allal 2016, 5), is taking place in the Indo-Pacific (appendix 1). This region is highly strategic for both parties because of the commercial crossroads, the proximity of their border but also because of its potential for development in the coming years.

So how does the technological competition between US and China is shaping the geopolitics and security in the Indo-Pacific? What are the consequences over the region and regional countries' affairs?

While the current technological rivalry between the US and China is the catalyst for their global rivalry and particularly in the Indo-Pacific (I). The efforts of both sides are causing major imbalances in regional geopolitics forcing regional states to choose sides and suffer the consequences (II).

I. The technological competition on 5G telecommunication and Artificial Intelligence between the United States and China is a catalyst of their global rivalry

A) New technologies such as 5G and artificial intelligence are new tools of power

If it was at the early beginning of the internet a question of entertainment, the Internet can be analyzed nowadays as the depart of the new version of power race. Described by Klaus

Schwab as the fourth industrial revolution, the new ultra-connected technologies have become an essential power tool that must be mastered. According to him, much more than a simple extension of the third industrial revolution, which he defines as the digital revolution, i.e., the joint interweaving of the physical, digital, and biological worlds, the fourth revolution is occurring at a speed never seen (Schwab 2016). It comes to modify the whole system of life, our production, management, and governance. AI, robotics, the internet of things, or quantum computing have the capacity to connect billions of people instantly with unprecedented storage, power, and knowledge. Especially since, as Moore's Law predicts, these technologies have the capacity and potential to grow exponentially (Brock, Moor 2006, 97). If today, we are confronted with the omnipresence of technologies in the years to come those will govern our lifestyles. AI is an excellent example. For it to be efficient, it must have access to a large amount of data that is currently provided by humans. But if society becomes even more connected, the data could come from everywhere and from itself, making AI even more powerful and able to accomplish more tasks. We could for example see the arrival of totally autonomous vehicles, totally personalized medical treatments, or even personalized educational systems (Kai-Fu 2021). We are only at the dawn of technological development in which our societies will only be more and more connected in the future.

Because of the omnipresence of these technologies, it is a question of security and national sovereignty for States. Raised to the level of strategic tool, N.T are qualified today by the States as critical technologies. The critical degree of a technology is defined by the U.S. Department of Defense "by the importance of the application to which the technology is put, critically is derived from the importance of the output of the system of which the technology is a constituent part, as well as from the significance the technology has for enabling that system" (Clinton White House n.d). These technologies are classified in seven categories: materials, manufacturing, information and communications, transportation, living systems, energy, environmental quality, which finally represent the whole of the fields of action which fall to the State. Critical technologies, because of their ultra-connectivity, are the intersection between economic domains, national security, democratic values, and geopolitical issues (Liao, Hoffman, Winkler 2021, 4). Thus, mastering these critical technologies is a matter of a state's resilience, sovereignty, and security. As soon as a State is not able to control these technologies, it is relegated to a State or a third-party company which would be in charge and in control of the whole of the country's activity. The Chinese Communist Party motivates its technology investments on the main problem, "the fact that core technology is controlled by others is our

greatest hidden danger" (Chesterman, Lee 2021). On the other hand, controlling these critical technologies gives states the opportunity to increase their control over the entire population through ultra-connectivity and the amount of data generated by citizens' use of connected objects. Establishing this surveillance on the population is a real gain because it enables to anticipate several things such as epidemics, popular protests, or deviant behavior (Schwab 2016). Insofar as these technologies require a certain economic development and qualification, many governments do not have the capacity to develop them. Thus, the current global order is shared between U.S. and China who have the capacity to export their own technologies outside its borders.

These critical technologies are therefore real tools of power, "ultimately, the ability of government systems and public authorities to adapt will determine their survival" (Schwab 2016). We have entered an era of technological race led by far by the world's most successful and competitive economies, namely the U.S. and China.

B) Technological competition on 5G and AI between the United States and China is a component of the Indo-Pacific force repartition.

a. *Political plan and leaders in the 5G and AI sectors*

After half a century of domination by the United States thanks to their favorable economic posture, technological advances, and leadership role, the catching up of China since the beginning of the 2000s, certainly allowed by the help of the Americans, has reshuffled the cards of this technological status quo. This technological rivalry has become even more pronounced in recent years with Xi Jinping's rise to power in 2012 and his policy agenda guided by Made in China 2025 and the Global China 2049 Initiative (Si 2018). To carry out these huge development projects, Xi Jinping launched the Belt and Road Initiative in 2013, which took a technological turn in 2015 with the Digital Silk Road (Oh 2021). The objective is to link the closer states via information and communication technologies, which particularly targets Indo-Pacific. Participating countries receive investments from the Chinese government and companies, including Huawei, to finance digital infrastructure. The strategy behind this project is to make Chinese AI and 5G technology companies such as Huawei, SenseTime or Cloudwalk, ultra-competitive and ubiquitous players (Mochinaga 2021). Huawei has become a standard bearer for China's technological development as the company is now one of the only

international companies with the capacity to install 5G communication (appendix 2). At the same time Beijing is trying to become more independent. Because technology is seen as a concern for national security all of China's largest technology companies are called upon to reduce their dependence on foreign technology, particularly in chips and drivers (Ryan, Fritz, Impiombato 2019). The government is committed to increasing its R&D investment by 7% each year and is investing heavily in these technology giants. SenseTime and Huawei, for example, have received an investment fund of more than US\$2 trillion to improve their competitiveness. The CCP is trying to become a real technological power by exercising total control over its national champions (Ryan, Cave, Xiuzhong Xu 2019). Concerning AI, the government also exercises total control, especially since the announcement in 2017 of the Next Generation AI Plan, which aims to make China the world's leading power in AI by 2030 by, support “command and decision making, military defense equipment, and other application”, “promote all kinds of AI technology to become quickly embedded in the field of national defense innovation” (Mori 2019).

The U.S. government, in reaction to China's technology development plans, is also working to become or rather maintain its technology power. After years of cooperation with China, the U.S. strategy during Trump mandate shifted from engagement to competition with China coined with the near simultaneous breakthrough of advanced technologies such as AI and 5G telecommunications (Mori 2019). The 2017 and 2018 National Security Strategy analyze the global context as a "great power competition" in which technological dominance is a core issue (Mori 2019). The U.S. government has also adopted technology development strategies. The Chinese Digital Silk Road is opposed by the American strategy of the Free and Open Indo-Pacific, which provides for multiple efforts in technology, connectivity, and cybersecurity. This strategy is mainly reactive and includes many initiatives to counter the growing expansion of Chinese companies in the region. On a discourse of national security and the threat of Chinese meddling, the U.S. is developing in 2018 the so-called Digital Connectivity and Cybersecurity Partnership mechanism, which is the combination of all government efforts with all international companies' efforts to counterbalance Digital Silk Road (Zhao 2020). In 2019, the Trump administration issued the National Defense Authorization Act which precluded government procurement of video surveillance and telecommunication from Chinese companies ZTE and Huawei (Mori 2019). This new restriction completes a list that the government had created in 1997, the Entity List, to address risks to the proliferation of weapons of mass destruction (U.S Department of Commerce).

The US government has since expanded the list to include other type of companies which has impacted the deployment of Huawei overseas and its overall expansion because it prompts traditional allies such as the members of the five eyes, United Kingdom, Australia, New-Zealand and Canada and the European Union to implemented policies aimed at limiting Huawei form their 5G infrastructures (Ryan, Fritz, Impiombato 2019). While one of the main criticisms and concerns of the U.S. government regarding the Digital Silk Road is its potential civil-military merger, Washington is also involved in this strategy. Insofar as 5G technology and AI are two so-called dual-use technologies, i.e., useful in both civilian and military affairs, it is possible to develop them under the civilian banner and then use them for military purposes and vice versa (Mori 2019). The U.S. announced in 2014 the Defense Innovation Initiative which pursue the Third Offset Strategy to preview a conventional overmatch against China. AI is seen as an “initial vector” that will allow the U.S. to regain power over China and to control the technologies world to come (Mori 2019). It is also following this initiative that DARPA create the Maven Project which is an innovation plan dedicated to the use of AI in the military affairs, to see it in the recognition, the communication, the surveillance, or the decision making (Mori 2019). The American strategy on AI can be summarized as follows: "The U.S. together with its allies and partners must adopt AI to maintain its strategics positions, prevail on future battles fields, and safeguard this order" (Mori 2019).

b. *5G and AI as new tools of power and diplomacy which create a geotechnological competition*

The technological competition is also a real discourse construction by the U.S and China. By the technological proposal of 5G and AI to the countries of the region to provide, invest or develop these technologies, we can see the construction of a discourse of rivalry and competition without mercy. “Technology policy formulation has recently gained a renewed importance for governments in the era of strategic competition” (Liao, Hoffman, Winkler 2021, 3).

In Indo-Pacific region the two biggest powers in 5G and AI are the US and China. Whether at the governmental level or in the private sector, semi-private in some cases, both largely dominate the development of N.T and use this supremacy to extinguish and deepen their regional influence. It would now be consistent to speak of technological diplomacy or geotechnology to qualify the use of technology as a lever of power against another state. As in

all areas of rivalry between the U.S. and China, the rivalry over technologic persuasion borrows two relatively different discourses. If the policy implemented by China is displayed as a means of international development and global harmony, the American policy is much more direct and reactive to this so-called Chinese policy. This leads some to name this new form of diplomacy as part of a "digital cold war" because of the ideological substance (Zhao 2020). On the Chinese side, Huawei has become the reference in the region in terms of 5G networks, but above all it has become a reference company for the development of the entire technological ecosystem for the countries that adopt it (Liao, Hoffman, Winkler 2021, 8). China promotes the concept of "internet sovereignty" advocating localization of data storage processing and transmission, and controls internet content (Zhao 2020). Huawei is no longer just a hardware company but has become a software company offering new technologies such as autonomous cars, which are equipped with AI, also from Chinese companies (Liao, Hoffman, Winkler 2021, 14). Thus, China can propose the development or the creation of a whole technological ecosystem to countries that accept it. This international development allows Beijing to achieve what they call "dual circulation", i.e., the countries receiving Chinese technologies receive technological infrastructures developed in cooperation with local companies, which boosts local innovations and generates more income and therefore prosperity (Oh 2021). China also offers operating and maintenance assistance, which further supports the power enjoyed by China. Laos, for example, is largely dependent on China and Huawei. By accepting Huawei's 5G technology, China has subsequently proposed the construction of a railway line connecting Laos to China, with Huawei providing the technological part. Thus, the role played by Huawei in China's influence in Laos is crucial since the installation of 5G networks has enabled the signing of more expensive contracts allowing China to establish itself in Laos. The technology installation proposal is the first step to other relationships.

This fine Chinese technological strategy feeds American technological diplomacy, which in turn comes as a reaction. Seeing the Chinese policy and particularly the Digital Silk Road and Huawei as real problems for the security of the region, the U.S. strengthen their presence through the deployment of their technologies (The White House 2022). Their last strategy in the Indo-Pacific reveals this will of deepening coordination and cooperation with the allied government, multilateral action on sensitive technologies by establishing a "Coalitions of Caution" to maintain US technological advantages (Ford 2018). But also restricting Chinese enterprises such as Huawei and ZTE. In addition to the ASEAN-Australia Digital Trade Standards Cooperation Agreement and the US-Japan Digital Trade Agreement,

Washington proposes the creation of an institution such as the Asia Quality Infrastructure Center to set standards for the construction of digital infrastructure to avoid states from falling into what they call "5G traps", the trap of Chinese 5G, which would only be the beginnings of a dependence on China in the making (Panda 2021). Faced with Huawei's technological commercial expansion and ability to convince countries to adopt these technologies, which are quite cheap and efficient, the U.S. are trying to multiply multilateral political projects to prevent this. With the argument of a "digital authoritarianism", the U.S. are developing a political and diplomatic arsenal to officially protect and secure the affairs of the states in the region which lead us to a "digital cold war" causing a game of divisions and alliances (Zhao 2020).

II. This technological rivalry impulse divisions, alliances and strategical partnership for the Indo-Pacific countries which threaten their national sovereignty and security.

A) The Indo-Pacific is a technological underdeveloped region who require huge investments, particularly in 5G and AI.

a. Alliance game and region representation for both

The Indo-Pacific region is highly strategic for both rivals due to its geographic size and the large number of states it comprises. As shown previously, technology is one of the means to increase diplomatic ties with countries and thus to become or maintain a certain status of power. Indeed, on the American side, the region includes some of its main allies, namely Australia, New Zealand, Japan, and South Korea. It is therefore essential for Washington to maintain its special ties with these four states, but more than anything else it would be important to extend these good ties with other states that are themselves in contact with its special partners. The growing expansion of Chinese diplomacy towards those state is therefore a growing concern for the U.S. Especially since there are some of their neighbors such as Indonesia, Sri Lanka or even the Pacific Islands that are getting closer to Beijing and deal for the most part with Huawei in the construction of their 5G networks (Oh 2021). For the U.S. is crucial both to keep its special relations with its traditional allies but also to limit the growing expansion of Chinese networks and its diplomatic relations. On the other hand, the region is also strategic for China because of its proximity to its territory. Huawei's breakthrough reflects the technological diplomacy employed by the CCP and the importance of the region for Beijing.

China's foreign policy is articulated in circles of importance according to the priorities to be addressed, in which the Indo-Pacific has a special place since it includes almost all the circles of this priority (Khurana 2008, 24). The region is thus perceived by China as its rear base in which it is necessary to exert influence.

Moreover, there is, as previously stated with the example of Laos, a high degree of dependence on the path when it comes to 5G networks and AI. Indeed, once a certain technology is deployed, it is very complicated to change it because all the infrastructure would have to be changed and rebuilt. Thus, choosing to install a 5G network for example in the case of Indonesia or Laos, it means that Huawei will be in the future the only partner in telecommunications, operation, and maintenance services. This is one of the reasons for the concern and activism of the U.S. By placing Huawei on its Entity List the U.S. are prohibiting its allies from doing business with the Chinese government and technologies (Sacks 2021). Australia and New Zealand have banned Huawei from building their 5G networks following pressure from the US.

b. The Indo-Pacific is a region devoid of technological development that allows both to fit in more

The region is also strategic because is technologically underdeveloped which means that rival can invest it. Technology is playing a critical role in effort by both Beijing and Washington to enhance their influence in the Indo-Pacific region because countries are in commanding position to assist other Asian nations to develop their high technologies sectors. The region has a transformative potential with rapid industrialization, urbanization, and digitalization because it is now at the early days of its exponential economic growth and represents a promising incoming market. It represents now a "digital frontier" (Runde, Savoy, Murphy 2020). More so in the wake of two years of pandemics that have led to a widespread economic crisis. The pandemic revealed these regional gaps and pushed the two rivals to turn towards this strategic region. Indeed, according to some estimates there are still nearly 2 billion people in the region that do not have internet access (Runde, Savoy, Murphy 2020). The digital economy in Indo-Pacific could be worth up to 400 billion US dollars (Ray, Jain, Jayakumar, Reddy 2021). Looking at the ASEAN states alone, the size of the digital economy has reached 100 billion in 2019 and is growing exponentially in terms of internet users. The region represents over 360 million internet users, most of whom access the internet via cell phones which provides

unreliable and patchy coverage, with very low take up of broadband (Ray, Jain, Jayakumar, Reddy 2021). Almost all Indians and Indonesians have only mobile connections for example (appendix 3). (Zhao 2020). Today, only Australia and Singapore have adequate rates of fixed broadband penetration and fiber internet subscriptions. This need for digital construction and the emerging digital market that the Indo-Pacific offers has been called the Digital Indo-Pacific concept (Ray, Jain, Jayakumar, Reddy 2021). Thus, there is indeed a need to connect the region but there is more than anything a huge market potential for both China and U.S.

These investments, as much for their degree of importance as for what they mean, provoke a game of alliance which creates a climate of threat and danger for the security, sovereignty, and independence of the Indo-Pacific's states.

B) This crucial need for technologies of the Indo-Pacific stimulates the bilateral competition between US and China whose try to have a global technological footprint over the region.

a. *The geotechnological competition is not only an issue for the rivals but also constitutes a concern for the regional security, sovereignty, and independence*

If the geotechnological competition between the U.S. and China to build a «Digital Indo-Pacific» is a major issue for both governments, it is also a major issue for the local states as it has become necessary for them to invest in more efficient telecommunication and internet networks. Indeed, beyond the dependence on the path in the construction of technological infrastructures, some policies of both worry mainly local governments especially the Chinese's New Data Security Act of 2021 (The National People's Congress of the People's Republic of China 2021). It establishes that China can collect, store, process all the data that come from its companies, like Huawei, in a manner that's consistent with the party paramount security concepts and objectives. The law applies not just to domestic data handling activities but also to data handling activity taking place outside the territory of the PRC (Hoffman 2021). All the articles of the law allow the CCP to exercise total control over all the data collected on the national territory and abroad and allow Chinese government to proceed to sanctions in case of threats or discriminating actions against Beijing. Article 24 states that "the State shall establish a data security review system and conduct a national security review of data processing activities that affect or may affect national security" (The National People's Congress of the

People's Republic of China 2021). Thus, there is also a high degree of bias and arbitrariness in the decisions made. This policy worries the regional states, which see in the choice of Huawei a possible Chinese control over all data because of the localization of their data will be in China which means that there will no longer be master of the control of these data or at least that another state can have access to these crucial data on the entire population, military, or economic affairs. This law makes some states in the region such as Vietnam fear the export of a digital authoritarianism (Mochinaga 2021). This additional factor in the geotechnical competition pushes some states to link with the U.S. to accept companies such as Samsung or Nokia for their 5G infrastructure. South Korea, for example, has mandated LG U to equip its 5G networks, while Vietnam has mandated Samsung Electronics (Sacks 2021). The Indo-Pacific states are therefore suffering from the situation because of the security substance of data and the assertive policies of both U.S. and China. They are now deprived from any arbitrary choices and are forced to choose a side with the perceived less bad partner which polarized the region and push some countries to react.

b. The forced creation of sides in the region pushes some states to create local partnerships and alliances

Because the security and sovereignty of the Indo-Pacific states are threatened with the geotechnological competition, they investigate new form of partnership. Globally, for the traditional allies of the U.S., the watchword is not to accept and use technologies other than those offered by China and particularly Huawei. Australia, Japan, and New Zealand have for example banned Huawei from their entire technology policy (Sacks 2021). Others such as the Solomon Islands, Papua New Guinea, and Taiwan, due to pressure from Australia and the U.S. have abandoned any plans to build 5G networks with Huawei in recent years (Sacks 2021). These countries must therefore operate with other alternative companies such as Nokia, Ericsson, or Samsung. On the other side of the spectrum, Huawei manages to establish itself in many countries such as Bangladesh, Sri Lanka, Thailand, Samoa, Fiji, and Indonesia. There is thus a clear split in the region between pro-Western technologies resulting from pressure from the U.S. and pro-Chinese technologies (Appendix 4).

At the same time, there are initiatives to create local alternatives or to look at other alternatives, India, Japan, and Australia have suggested a possible technological alliance to counter Huawei's regional monopoly (Gargeyas 2022). Although Washington's involvement in this proposal should not be overlooked, it may be an alternative for the security of the Indo-

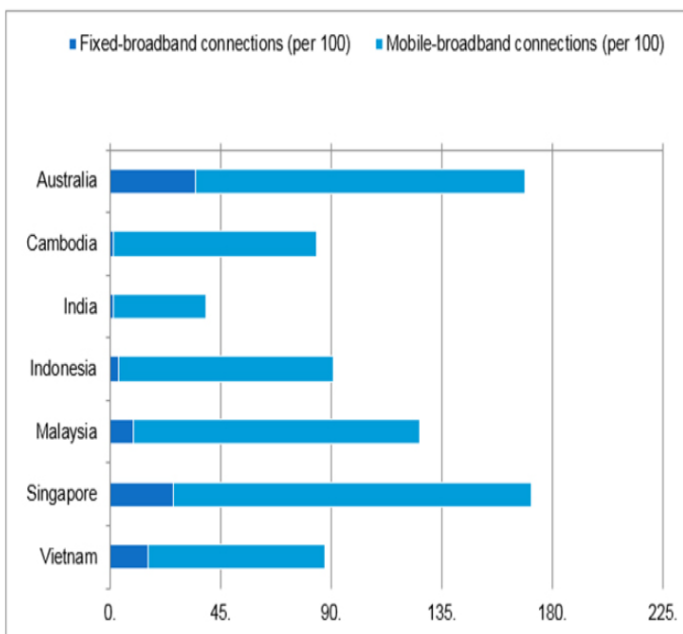
Pacific countries. The three technologically competent and growing powers in the region can steer the South, Southeast, and East Asian states away from China's technological trap. All three have recently formulated new technology policies to strengthen and expand their domestic and international technology capacity. Tokyo, for example, released its 2021 Science, Technology, and Innovation Foundation Plan, and Australia its Artificial Intelligence Standards Roadmap to strengthen and improve its own capabilities (Government of Japan 2021). Both plans call for increased investment and partnerships in the region, but they must rely on the telecommunications equipment of U.S. and European companies (Gargeyas 2022). Therefore, while this is a great initiative overall for their national and regional security, it cannot be effective until they have appropriate companies capable of developing a new robust technological framework. Nevertheless, the European Union can be an alternative to the United States and China. By offering a third way of technology partnership, France, the United Kingdom, or Germany can provide the region with substantial assistance and investment in technology building (European Union External Action 2021). By avoiding a possible Chinese technology trap and an overly broad cooperation with the U.S., the EU proposal may ultimately be a possible way to avoid this geotechnological competition.

Conclusion

Our now digitalized lifestyles give these technologies a strong strategic and security degree explaining the mobilization of the two rivals in the field. With the deployment of their technological diplomacy in the Indo-Pacific, both intend to fill the significant technological gap of some regional states such as Indonesia, India or even the Pacific Islands. But this desire to establish a digital Indo-Pacific is a threat to the security of local governments, as their 5G networks and the various AI deployed nationally do not belong to them. With the example of the Chinese data security law of 2021, it is possible to see that mandating a foreign company such as Huawei is not trivial for the control of national data and therefore for the security of states.

The idea has recently been launched by Japan, Australia, and India to create a common technological front that would not only allow them to preserve a certain resilience but could also allow other states in the region to have a local alternative.

Appendix 3 :



World Bank Data and the WEF Global Competitiveness Report 2019.

Appendix 4:



Bibliography

- Brock, David, and Gordon Moore. 2006. *Understanding Moore's Law, Four Decades of Innovation*. Chemical Heritage Foundation. Consulted online 10/04/2022.
https://www.google.fr/books/edition/Understanding_Moores_Law/woBkE-SOCUC?hl=fr&gbpv=1&dq=moore+law+on+technology&pg=PA97&printsec=frontcover
- Clinton White House. N.d. "Appendix A. National Critical Technologies List. US government. Consulted online 28/03/2022.
<https://clintonwhitehouse3.archives.gov/WH/EOP/OSTP/CTIformatted/AppA/appa.html>
- European Union External Action. 2021. "EU strategy for Cooperation in the Indo-Pacific". Consulted online 10/04/2022.
https://www.eeas.europa.eu/eeas/eu-strategy-cooperation-indo-pacific-0_en
- Ford, Christopher Ashley. 2018. "Coalitions of Caution: Building a Global Coalition Against Chinese technology-Transfer Threats". *U.S. Department of State*, September 13th 2018. Consulted online 08/10/2022.
<https://2017-2021.state.gov/remarks-and-releases-bureau-of-international-security-and-nonproliferation/coalitions-of-caution-building-a-global-coalition-against-chinese-technology-transfer-threats/index.html>
- Gargeyas, Arjun. 2022. "India, Japan, Australia need tech alliance to counter China and Huawei's monopoly". Published on *ThePrint* March 25th 2022. Consulted online 10/04/2022.
<https://theprint.in/opinion/india-japan-australia-need-tech-alliance-to-counter-china-and-huaweis-monopoly/887683/>
- Goodman, Marc, Zak Allal. 2016. "The strategic challenge of emerging technologies". *School of Economic Warfare*, January 19, 2016. Online.
<https://www.ege.fr/sites/ege.fr/files/uploads/2016/01/enjeux-technologies.pdf>
- Government of Japan. 2021. Science, Technology, and Innovation Basic Plan. March 26, 2021. Consulted online 08/04/2022.
https://www8.cao.go.jp/cstp/english/sti_basic_plan.pdf
- Hoffman, Samantha. 2021. "The U.S-China Data Fight Is Only Getting Started". Published on *ForeignPolicy* July 22nd 2021. Consulted online 28/03/2022.
<https://foreignpolicy.com/2021/07/22/data-tiktok-china-us-privacy-policies/>

- Jongsoo, Lee and Simon Chesterman. 2021. "Artificial Intelligence and Big Data in the Indo-Pacific". Published on *The Diplomat* October 21st, 2021. Consulted online 04/04/2022. <https://thediplomat.com/2021/10/artificial-intelligence-and-big-data-in-the-indo-pacific/>
- Kai-Fu, Lee. 2021. *AI 2041*. Random House Libri.
- Khurana, Gurpreet. 2008. "China's 'String of Pearls' in the Indian Ocean and Its Security Implications". Published in *Strategic Analysis* 32 (1): 1-39. Consulted online 15/04/2022. https://www.tandfonline.com/doi/full/10.1080/09700160801886314?casa_token=CBE42SqewvQAAAAA%3AkHSba4qAx7MWCUHMPKbaYaC_212h-N68TjHV8vacxINkZBL5Ozul-e_rflmQNLxbB9NrQC-YjnK9
- Liao, Kitsch, Samantha Hoffman and Karly Winkler. 2021. "Benchmarking critical technologies. Building an evidence base for an informed critical technologies strategy". *International Cyber Policy Center, ASPI* 53. Consulted online 02/04/2022. <https://s3-ap-southeast-2.amazonaws.com/ad-aspi/2021-11/Benchmarking%20critical%20technologies-v2.pdf>
- Mochinaga, Dai. 2021. "The digital Silk Road and China's technology Influence in Southeast Asia". Published by *Council on Foreign Relations* June 10th 2021. Consulted online 08/04/2022. <https://www.cfr.org/blog/digital-silk-road-and-chinas-technology-influence-southeast-asia>
- Oh, Miyeon. 2021. "US-China Rivalry and Digital Connectivity the Indo-Pacific". Published in *Global Asia* 16 (4). Consulted online 04/04/2022. https://www.globalasia.org/v16no4/cover/us-china-rivalry-and-digital-connectivity-in-the-indo-pacific_miyeon-oh
- Panda, Jagannath. 2021. "China Plus One: Supply Chain Resilience Initiative and Beijing in Indo-Pacific". Published in *Manohar Parrikar Institute for Defence Studies and Analysis*. Consulted online 10/04/2022. <https://policycommons.net/artifacts/1925874/china-plus-one/2677644/>
- Runde, Daniel, Conor M. Savoy and Owen Murphy. 2020. "Post-pandemic Infrastructure and Digital Connectivity in the Indo-Pacific". Published by *Center of Strategic & International Studies*, November 2020. Consulted online 05/04/2022. https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/201102_Runde_Post_Pandemic_Infrastructure_Digital_Connectivity_Indo_Pacific_0.pdf
- Ray, Trisha, Sangeet Jain, Arjun Jayakumar, Anurag Reddy. 2021. "The digital Indo-Pacific: Regional Connectivity and Resilience". Published by *Observer Research Foundation* February 15th 2021. Consulted online 10/04/2022.

<https://www.orfonline.org/research/the-digital-indo-pacific-regional-connectivity-and-resilience/>

Ryan, Fergus, Audrey Fritz and Daria Impiombato. 2019. "Mapping China's Tech Giants: Reining in China's technology giants". Published by *ASPI*. Consulted online 04/04/2022. <https://www.aspi.org.au/report/mapping-chinas-technology-giants-reining-chinas-technology-giants>

Ryan, Fergus, Danielle Cave and Vicky Xiuzhong Xu. 2019. "Mapping more of China's technology giants, AI and surveillance". *International Cyber Policy Center, ASPI* 24. Consulted online 08/04/2022. <https://ad-aspi.s3.ap-southeast-2.amazonaws.com/2019-12/Mapping%20more%20of%20Chinas%20tech%20giants.pdf?VersionId=wpDVHKGXJHzeK8rZ.kmy0Ei63RxXMO>

Sacks, David. 2021. "China's Huawei is winning the 5G Race. Here's what the United States should do to respond". Published on *Council on Foreign Relations* March 29th 2021. Consulted online 08/04/2022. <https://www.cfr.org/blog/china-huawei-5g>

Schwab, Klaus. 2016. "The fourth Industrial Revolution: what it means, how to respond". Published on *World Economic Forum* on January 14th, 2016. Consulted online 02/04/2022. <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>

Si, Ma. 2018. "Made in China 2025 roadmap updated." Published by *The State Council The People's Republic of China*. January 27th, 2018. Consulted online 20/04/2022. http://english.www.gov.cn/news/top_news/2018/01/27/content_281476027458050.htm

The National People's Congress of the People's Republic of China. 2021. "Data Security Law of the People's Republic of China". June 10, 2021. Consulted online 02/04/2022. <http://www.npc.gov.cn/npc/c30834/202106/7c9af12f51334a73b56d7938f99a788a.shtml>

The White house. 2022. "Indo-Pacific Strategy of the United States". February 2022. Consulted online 28/03/2022. <https://www.whitehouse.gov/wp-content/uploads/2022/02/U.S.-Indo-Pacific-Strategy.pdf>

U.S Department of Commerce. N.d. "Entity List". Consulted online 08/10/2022. <https://www.commerce.gov/tags/entity-list>

Zhao, Minghao. 2020. "U.S Perception of and Response to the Digital Silk Road". Published on *China International Studies* 16 (5): 84-106. Consulted online 04/04/2022. <https://en.igcu.pku.edu.cn/info/1636/2376.htm>

Appendix bibliography

Appendix 1

Heiduk, Felix and Gudrun Wacker. 2020. "From Asia-Pacific to Indo-Pacific, Significance, Implementation and Challenges". Published by *Stiftung Wissenschaft und Politik, Deutsches Institut für Internationale Politik und Sicherheit*, July 1st 2020.
<https://www.swp-berlin.org/10.18449/2020RP09/>

Appendix 2

Ryan, Fergus, Audrey Fritz and Daria Impiombato. 2019. "Mapping China's Tech Giants: Reining in China's technology giants". Published by *ASPI*. Consulted online 04/04/2022.
<https://www.aspi.org.au/report/mapping-chinas-technology-giants-reining-chinas-technology-giants>

Appendix 3 and 4

Ray, Trisha, Sangeet Jain, Arjun Jayakumar, Anurag Reddy. 2021. "The digital Indo-Pacific: Regional Connectivity and Resilience". Published by *Observer Research Foundation* February 15th 2021. Consulted online 10/04/2022.
<https://www.orfonline.org/research/the-digital-indo-pacific-regional-connectivity-and-resilience/>