

CSS | ISSUE BRIEF

WEAPONISATION OF 5G

Dusky geopolitical implications of a potential technological race

Rushil Khosla

INTRODUCTION

The rapid development and ascendance of technology in our daily lives has resulted in nations prioritising their technological aims, and broadcasting it as national and global goals. Standing on the shoulders of 4G, 5G aims to reinvent technological possibilities and the individualistic experience of the internet. Consequentially, 5G has earmarked itself as a crucial tenet of a new industrial revolution. In times past, the bastion of 5G would be held by the United States of America (US). The biggest economy of the world has held overbearing influence over any global developments and has been the consequential heir and world leader in technological developments. However, one would be wrong to believe that history would be dictated yet again. Since adopting economic liberalisation measures in 1978, the Chinese economy has grown from strength to strength. From its adoption under the Deng Xiaoping leadership to its blossoming under the Xi Jinping leadership, China's strong economy has provided itself the freedom to wield significant global influence. China's growth has resulted in the development of bipolar spheres of influence and as illustrated by the recent US-China trade war, the pathway to a 5G world could lead to further frostiness between the two superpowers. The following paper would therefore elaborate on the weaponisation of 5G. The paper would firstly aim to establish the current landscape, further delving into the China challenge and its considerations. The paper would consequently extrapolate on the weaponisation of 5G and geopolitical considerations of such a development. The research paper is influenced through secondary resources such as journals, newspaper articles and interviews.

THE PROMISE OF 5G

The promise of 5G is unparalleled. 5G isn't simply a technological development which would cause an increase in download speeds, but rather has the ability to act as the backbone of future smart cities, autonomous devices and a plethora of state and commercial applications.¹ 5G's low latency and high speed would allow for faster telecommunication and increased connectivity. The development and deployment of 5G pilots have increased exponentially, with recent data suggesting that 5G pilots are live in more than 60 countries.² The prospect of 5G, has rightfully led to a vast advancement of the nascent ecosystem. The advantages of 5G could benefit the world economy greatly, however, international cooperation is a hurdle in itself.

¹ John R. Hoehn and Kelley M.Slayer, (2021). "National Security Implications of Fifth Generation (5G) Mobile Technologies", *Congressional Research Service*, pp. 1-3.

² Robert Kramer, (2021). "5G Commercial Networks are now live in more than 60 Countries", *GSA*.

With the development of a bipolar sphere of influence, the 5G technological race would be hotly contested. Although nations such as Japan, South Korea and European nations such as Norway and Sweden, have illustrated 5G readiness, their development pales in comparison to the mammoth effort of the US and China. Reminiscent of the 2018 US-China trade war, 5G has emerged as a new frontier for a global showdown.

THE CURRENT LANDSCAPE

The control over core technologies required for the development of 5G is a matter of global importance. Although the former US president, Donald Trump, has claimed America to be the world leaders in 5G technology,³ metrics and intelligence reports have suggested otherwise, with China having an upper hand. Such intelligence is based on factors such as spectrum and physical infrastructure, as well as the number of private players in the technological race.

5G technologies intend to use two types of electromagnetic spectrums for its function. The 5G MMV spectrum runs between 24GHz and 100GHz, and its intensive signal is essential for future autonomous vehicles, smart cities etc. However, the aforementioned spectrum is expensive, requires a higher number of cells sites and runs at the risk of being disturbed by factors such as rain. The second type of electromagnetic spectrum is the 5G sub-6GHz spectrum, which allows for a lesser signal, but increased coverage. Consequently, this technology is comparatively cheaper and easier to deploy.

China has adopted to focus more on the sub-6 spectrum, while some US telecommunication providers are focused on the more expensive MMV spectrum. However, China has achieved the first mover advantage. Along with its continued investment, China has capitalised on the inefficiencies of the US government. The foremost discrepancy which has delayed the American transition to 5G technology is the rift between the state and the private players. The Department of Defence extensively uses huge portions of sub-6 availability in the US. Although initiatives promulgating sharing of the aforementioned spectrum have taken place, the Department of Defence believes greater sharing could cause security issues. Therefore, the timeline to safely share the spectrum space is expected to be 5 years. Conversely, China's transition and development of 5G technology and infrastructure has been smooth, thanks in part to the deep link between the government and Chinese private companies.

Chinese companies often receive government subsidies such as land and Research and Development (R&D) grants, however, the relationship is deemed to be mutually beneficial. Enacted in June of 2017, China's National Intelligence Law declared that "any organization and citizen would be obliged to provide assistance and co-operate, in matters of national intelligence."⁴ The establishment of such a law gives legal precedent for a deeper interplay between the Chinese Communist Party (CCP) government and major telecommunication

³ President Donald J. Trump, (2019). "President Donald J. Trump is taking action to ensure that America wins the race to 5G", *Fact Sheets*.

⁴ Bonnie Girard, (2019). "The real danger of China's National Intelligence Law", *The Diplomat*.

players such as Huawei and ZTE. The relationship has certainly been advantageous for Chinese telecommunication giant Huawei. Subsidies and government support has helped propel the company as the leading private player of 5G technologies worldwide. Whereas telecommunication companies such as Nokia and Ericsson account for 17 percent and 13 percent of the global market respectively, Huawei boasts an impressive 29 percent. Consequentially, Huawei has scored 91 commercial 5G contracts,⁵ which exceeds the contracts scored by any other telecommunication company.

Nevertheless, the deep interplay between the Chinese government and its private players has opened a labyrinth of security concerns. Although 5G is denoted for its speed, security has become a great cause of concern for governments around the world. The National Intelligence Law, which once opened the door for a mutual relationship, has also led to suspicions regarding intelligence and data infringement. Industry experts believe vulnerabilities in data security arose through poor business practices in China. A presence of malicious intent is also denoted. Huawei has faced international pushback and condemnation over its recent story of data espionage.⁶ The most infamous instance of security concerns dates back to 2004, when the telecommunication company, Nortel Networks, discovered an impingement of 1500 sensitive files from the Chinese telecom giant.⁷ Huawei has also been subject to allegations of Intellectual Property (IP) theft. In the past, Huawei has been accused of stealing data from Cisco. The resulting legal dispute resulted in Huawei conceding to claims of IP theft in 2003.⁸ This past history is of utmost relevance today. With 5G being the new frontier of a geopolitical showdown, US officials have urged its allied countries to be wary of the security risk posed by Huawei 5G networks. This has led multiple security analysts to believe that the US would limit intelligence sharing with any nation that employs Chinese telecom 5G equipment.

The biggest cause for 5G related security concerns stem from the infrastructure of Chinese telecom companies. Huawei and ZTE have evoked fears in part to their core network and radio access networks. The core network is the face value of 5G, providing faster wireless internet and increased connectivity. The radio access network is the bedrock of the 5G system, composed of cellular towers that broadcast signals. The doubt over the infrastructural integrity combined with the geopolitical paranoia between the two superpowers have culminated in a pseudo-Cold War phenomenon. Whereas in the 1960's a missile crisis led to heightened tension between the Soviets and the Americans, in the 2020's, 5G security concerns could heighten tension between the Chinese and the Americans.

However, much of the security concerns are also attributed to the structural inequities of the 5G system. The 5G system is being built on the back of 4G's regulatory framework. The protocol specification, which was once approved for 4G, have not yet been revised for 5G. This

⁵ Ma Si, (2020). "Huawei secures most 5G contracts around world", *China Daily*.

⁶ Kate O' Flaherty, (2019). "Huawei Security Scandal: Everything you need to know", *Forbes*.

⁷ Brian Fung, (2019). "How China's Huawei took the lead over U.S companies in 5G technology", *The Washington Post*.

⁸ Brian Fung, (2019). "How China's Huawei took the lead over U.S companies in 5G technology", *The Washington Post*.

conjecture, however, doesn't account for the innumerable capabilities of 5G. Due to the lack of a formal verification for 5G specifications, malicious attacks can be incentivised and sensitive information would be at risk.⁹ This, in turn, could cause great damage. Damage to a scale which even 4G cannot comprehend. 5G is intended to be the backbone of smart cities, autonomous vehicles and various state applications. An infringement in 5G would result in a cascading impact to all structures of society which rely on telecommunication. This adds another layer to the ongoing geopolitical conflict between America and China. With 5G being the crucial deciding factor of global supremacy, incentives to sabotage/cheat would also increase.

THE CHINA CHALLENGE AND 5G

Long been seen as the industrial hub for corporations, China has meekly been regarded for the inferior quality of its own exports, and for being a manufacturing heaven for American companies. The international identity of China has historically been synonymous to ideas of mass poverty. However, since measures of economic liberalisation were undertaken in the 1970's, economic prowess and national integrity have been the focus. For the CCP government, Huawei and ZTE are at the heart of their utopian vision. The worldwide prowess of Huawei currently highlights the strength of a grassroot Chinese company. Along with being the current world leaders in 5G technology, Huawei's progress is also a stark reminder of the fall of American telecom companies.

The United States had been the dominant force in 4G technology. However, many analysts believe that US would fail to overcome the sizeable advantage hatched by Chinese telecom companies. The US had formally announced its 5G plans in 2018, however, the Chinese government established its own 5G intentions in 2007. Subsequently, reports suggest that since 2015, China has outspent the United States by over 24 billion dollars.¹⁰ As noted above, the eagerness to be the first one out of the gates stems from the vast array of opportunities presented by 5G. However, the role of national identity is also at play. Immense support to Huawei from the Chinese government indicates the importance of national supremacy. Similar to another notable Chinese infrastructural project, i.e., the belt and road initiative, 5G dominance serves as a medium for Beijing to exert global influence.

Economic reasons act as an added incentive in the race towards 5G supremacy. Still recovering from the turbulent impact of the US-China trade war in 2018, analysts believe a major patent war could ensue over 5G technologies as well.¹¹ This is due to the immense financial gains borne out of licensing of 5G technology. 5G is intended to change every facet of our lives. However, industries using 5G would have to pay royalties over 5G equipment and software

⁹ Tara Seal, (2019). "The Promise and Peril of 5G", *Threat Post*.

¹⁰ Arjun Kharpal, (2018). "China has outspent the US by \$24 billion in 5G technology since 2015, study shows," *CNBC*.

¹¹ Marshall Phelps, (2019). "Is 5G being weaponized?", *Forbes*.

vendors for the rights to use their 5G technology. A patent war over the geopolitical claims of national security risk could make 5G technologies much more expensive to use, sabotaging the advantages it presented. Analysts believe that outright exclusion of telecom companies such as Huawei would increase the deployment cost of 5G.¹² An overbearing geopolitical influence over 5G could in turn, hurt the prospect of the nascent industry.

An added layer to the geopolitical clash is 5G's role in military/defence applications. The Chinese government is avidly exploring options through which 5G could be integrated to its current military applications. Analysts believe that 5G would improve battlefield communications, "with faster and more reliable information transmission."¹³ 5G would be central in the "Intelligentization",¹⁴ the Chinese defence concept of integrating AI (Artificial Intelligence) and military applications. Similar to being the backbone to future smart cities, 5G would be the backbone of on ground mobilisation and logistics of future warfare. It is also important to denote the culture around 5G in China. The state wide support for the 5G era, is perverse to the American attitude towards 5G. Far from the hopeful attitude towards technology, 5G has been met with scepticism from the American public. This rift creates an inherent advantage for the Chinese government. An embracing attitude towards 5G allows for a "military-civil fusion", allowing the Chinese military to benefit from its Civilian economy. The CCP government's integrated approach would "blend even local developments with national requirements of defence."¹⁵ Preliminary test projects, such as the 5G infrastructural development in Chongqing, aim to incorporate the Chinese telecom industry as well as its Aerospace and Technological corporations.

The US is also exploring the intersection of 5G and defence. Kelley M. Sayler, an analyst in advanced technology and global security, claims that 5G technologies would be of immense importance for autonomous vehicles, C2, logistics and AR and VR training.¹⁶ As military devices increasingly prioritise software developments, the technological pillar to support such devices has to be reliable. Vehicle operations would require 5G's high data and low latency rates to download off-board information. Intelligence devices such as ISR, which aim to anticipate change and mitigate its negative externalities, would require high bandwidth to process and disseminate information. Most importantly, command and control systems would benefit greatly. The US military currently uses satellite communication for its long-distance signal. However, the amount of distance also increases the latency of the signal. 5G implementation would eliminate the aforementioned problem as well.

¹² Julian E. Barnes, (2019). "U.S Campaign to Ban Huawei Overseas stumbles as allies resist", *New York Times*.

¹³ Elsa B. Kania, (2019). "Why China's Military wants to beat the US to a next-gen cell network", *Defence one*.

¹⁴ Jerry A Smith, (2020). "Intelligization: China's road to AI warfare algorithms", *LinkedIn*.

¹⁵ Elsa B. Kania, (2019). "Why China's Military wants to beat the US to a next-gen cell network", *Defence one*.

¹⁶ John R. Hoehn and Kelley M.Slayer, (2021). "National Security Implications of Fifth Generation (5G) Mobile Technologies", *Congressional Research Service*, pp. 1-3.

WEAPONISATION OF 5G AND ITS PUNITIVE NATURE

The bipolar sphere of influence has led to Trade and Investment becoming increasingly strategic in nature. An economic deal today isn't just simply defined by its monetary value, but also with the added connotations of a geopolitical partnership and negation of other geopolitical partnerships. Reminiscent of the groupings during Cold War, both America and China have recruited a host of nations aligned with their ideologies. Weaponisation of 5G is yet another tenet of the increased strategisation between the two countries.

China has had an infamous history of weaponising trade. In 2012, China restricted its export of rare earth mineral to Japan in order to inflict economic duress. This was due to a sovereignty dispute with Japan over the Senkaku Islands. Weaponisation of rare earths was also noticed during 2018 US-China trade war. Post 9/11, America has staked a claim over the Middle East. Substantiated by calls of securitisation and eliminating terrorist groups, America has consequentially singed any economic relationships of countries such as Iran and Afghanistan. Recently, Trump's "America First" approach, which led to America's withdrawal from the World Trade Organisation (WTO) and Paris climate accords, highlights the US government's non-cooperation and distaste for globalism.

The battle for 5G supremacy increases every day. Although, the US government has flagged Huawei for its security concerns, a geopolitical play is also at stake. The vociferous condemnation of Huawei's ethicality has prompted the Australian government to limit the use of Huawei and ZTE equipment for the country's 5G networks.¹⁷ This decision led to a domino effect. In late November, UK banned Huawei's new 5G kit.¹⁸ Jeremy Fleming, the director of the Government's communications headquarter, believed China as a significant threat to national security. Presently, the European market for Huawei is on a shaky ground. In July of 2018, the Huawei 5G pilot in Rotterdam came under scrutiny after parliamentarians evoked concerns over cybersecurity threats to critical infrastructure. Following which, the Dutch telecommunication companies chose Swedish based Ericsson.¹⁹ In October 2018, the German government asked Huawei to review the telecom giant's code. In April 2021, Germany also launched a 5G partnership with Ericsson.²⁰

Conversely, China is exporting its technology and tools to Latin America, Africa and Southeast Asia. According to recent reports, China has deployed nearly 916,000 5G base stations around the world, accounting for nearly 70% of the global 5G coverage.²¹ The sheer scale and years of planning have insured China against US aggression, for now. Countries which aim to use

¹⁷ Business Standard web team, (2020). "China could have shut down Australia's 5G network without Huawei Ban", *ANI*.

¹⁸ BBC web team, (2020). "Huawei Ban: UK to impose early end to use of new 5G kit", *BBC*.

¹⁹ Reuters Web Team, (2020). "Dutch telecom KPN picks Ericsson 5G network", *Reuters*.

²⁰ 日本語, (2020). "Vodafone partners with Ericsson for Europe's largest commercial 5G standalone network", *Ericsson*.

²¹ WION Web Team, (2021). "China claims to have 70 of global 5G stations amid international security concerns", *WION*.

Huawei 5G technologies have also come to the defence of the Chinese telecom giant. South African president Cyril Ramaphosa claims Huawei to be a victim of the US trade war with China.²² Other partner countries in the aforementioned continents have followed South Africa's narrative. Argentinian president Alberto Fernandez states, "In the local market, Huawei works without any problems."²³ Huawei is managing the resistance of US government fairly well, with the telecom giant not losing any orders in Africa.

Since losing the first movers' advantage, the US government is exerting its influence to block Chinese technology, whilst removing regulatory hurdles for its own private firms. In June 2021, Verizon, an American telecom company, launched its first private enterprise 5G.²⁴ As noted earlier, the US state government aims to work closely with private corporations. In October 2018, Trump signed a presidential memorandum directing the commerce department to share electromagnetic spectrums with American telecom companies for 5G development in the US.²⁵

GEOPOLITICAL FUTURE OF 5G

The geopolitical clash concerning 5G places the future of 5G in a precarious position. Security analysts believe that even if the US were to succeed in securing their own 5G networks, they would still be reliant on overseas digital infrastructure.²⁶ Resultingly, it is in the global interest for US and China to have a collaborative approach towards 5G technology. Therefore, the future of 5G would be laden with considerations.

The primary concern is supply chains. As seen through the research papers foray into weaponisation of trade, global supply chains are at the behest of international politics. Such scenarios have substantiated the need for resilient supply chains. Strong network and support of allied countries is important in establishing trust. It's trust which is crucial in resilient supply chains. Countries could agree to join a singular diplomatic grouping to tackle the issues surrounding politics of 5G technology. A hypothetical grouping could focus on 5G technological inventory in order to create a buffer against the politics of America and China. Countries could begin to diversify their manufacturing bases. This would mean switching to technological partners outside of the US or China. European telecom companies such as Nokia and Ericsson, as well as Asian telecom companies such as Roku and Samsung, stand to benefit. Additionally, a focus on local supply chains, albeit more expensive, would insure third party

²² Loni Prinsloo, (2020). "Huawei Strengthens its Hold on Africa despite US led boycott", *Bloomberg Businessweek*.

²³ Bangar, (2020). "Will Huawei weather 5G storms in Latin America?" *Financial Express*.

²⁴ Gina Narcisi, (2021). "Verizon business launches first private Enterprise 5G network in U.S", *CRN*.

²⁵ David Shepardson, (2018). "Trump signs order to set U.S spectrum strategy as 5G race looms", *Reuters*.

²⁶ US Intelligence Community, (2019). "World Wide Treat Assessment of the US intelligence community", *Office of the director of National Intelligence*.

countries (every country except US and China) to have more control over inventory and assembly of 5G technology.²⁷

Plurilateral groupings for the purposes of 5G could also take initiatives to ensure 5G security. The groupings could formalise a rigorous global process of screening potential 5G vendors. This would include a meticulous scrutiny into the vending company's business practices, their track record, transparency regarding government and civilian requests etc. The cut-throat dialogue between the US and China would also substantiate the need for a comprehensive framework of future collaboration and public transparency. The Chinese and US governments should support research projects, public industry discussions etc.

To conclude, China has hedged its bet on 5G. Considering its advantageous proposition, China is well positioned for the future. However, if it were to be successful in realising its 5G ambitions, China needs a partner to dance with. It can be concluded that America rested on its 4G laurels, and were unprepared for the 5G era. However, America must also embrace the future of wireless connectivity. The weaponisation of 5G, not just hurts America and China, but the entire world is held hostage by their diplomatic quarrels. With 5G being touted as the backbone of our future society, third party countries must demand for transparency and dialogue between the two competing nations. Third party countries should unite diplomatically in order to ensure a secure and fast 5G future.

²⁷ Sarah Hippold, (2020). "6 Strategies for a more resilient supply chain", *Gartner*.