CSS | ISSUE BRIEF

D10 as an alternative to Huawei 5G

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INTRODUCTION

Debates around emerging technologies like 5G and their impact on national power are no longer along the lines of exploratory research. In this digital era, these kinds of technologies will play a major role in shaping the world order. Especially with the emergence of 5G, which is perhaps a precursor to the ubiquitous internet, a state or a private company will gain the potential to control the communications and perceptions of the world societies. This possibility urges countries to have greater control over communication networks and the internet. Further, the language used by the Oxford Information Labs paper to describe Huawei's US$13.4 million investment in 5G R&D shows that such investments are rare and strategic.[2] Renowned Oxford historian, Yuval Noah Harari concludes that the governance systems across the world are designed to deal with the industrial era society, and with the dawn of cutting-edge biotechnology and information technology they stand clueless.[3]

The neo-realist approach towards geopolitics has a standard analysis of world politics based on the protection of national interest and the survival of the sovereign state. One of the explanations regarding the behaviour of the states when faced with a belligerent state is given by Kenneth Waltz as '*balance of power*.' Neo-realism and balance of power indicate that when the technologies like 5G can control the data, information of a nation, it becomes imperative to securitize the technology. Huawei's entry into the 5G technology and its claimed successful model creates a clash between the western political ideals like liberty and the free market with that of the Chinese authoritarian system. The United Kingdom proposal to form an alternative group of 10 states, called the D10, to counter the Chinese model of technology can be thought of as a *balance of power* move. States which have democratic principles are asked to rally behind each other to ensure a free supply chain market and a 5G technology attuned with democratic values. This paper aims to provide a basic understanding of 5G technology, reasons for securitizing 5G technology and how and why D10 emerged. Finally, it provides a critical analysis of the proposed D10 group.

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[2] Hoffmann, Stacie, Bradshaw Samantha, and Taylor Emily. 2019. "Networks and Geopolitics: How great power rivalries infected 5G." *Osford Information Labs.* https://oxil.uk/publications/geopolitics-of-5g/Geopolitics_5G_Final.pdf.

[3] Harari, Yual Noah. 2019. *21 Lessons for the 21st Century.* London: Vintage.

China based Huawei encountered a stiff challenge in penetrating the Western European market. Except for Spain, all other major European states have effectively banned Huawei or are on their way to do so. The story takes a different turn when Eastern European states are considered. From a working paper published by the Rajaratnam School of International Studies, it appears that the US initiative named 'Clean Network' is somewhat successful in shielding Europe from Huawei's access.[4] Rajiv Malhotra reiterates that the US ban of Chinese investments and companies like TikTok and Huawei are measures to set back China's lead in AI-related development.[5] This shows that Western European powers are in tandem with the US in securing their technological superiority. Before moving any further into a discussion on how UK aims to counter Huawei's 5G with its proposed D10, it is imperative to know what exactly is 5G and how it operates.

WORKING OF 5G AND ITS VULNERABILITIES

Working of 5G

The exact working of the 5G technology is not yet known. However, a commonsensical understanding provides that it reduces latency and increases data speed. It is claimed that 5G would deliver data in less than a millisecond which is seven times higher than 4G and achieve a peak download speed of 20 Gigabyte per second.[6] That means a full HD movie can be downloaded within a second. 5G technology is not a unique product designed to enhance the speed and bandwidth of data sharing. It is a technique that uses a combination of existing technologies and infrastructures to reduce latency and improve the bandwidth by securing more connections.[7]

Coming to the working of 5G, there are five techniques mentioned by IEEE spectrum which can be used together to create 5G: Millimetre waves, Small Cells, Massive MIMO, Beam Forming and Full Duplex. A simple understanding of the above combination is that

1. The data from a device is emitted or received in the form of millimetre waves.
2. The receiving and transmitting of those millimetre waves are coordinately done using *Small cells* and *Massive MIMO*. *Small cells* are a kind of antennae that can be mounted on the streetlights and buildings because of their size. These mounted antennae would

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[4] Umbach, Frank. 2020. "EU POLICIES ON HUAWEI AND 5G WIRELESS NETWORKS ECONOMIC–TECHNOLOGICAL OPPORTUNITIES VS CYBERSECURITY RISKS." *Rajaratnam School of International Studies Working Paper Series.*

[5] Malhotra, Rajiv. 2021. *Artificial Intelligence and the Future of Power.* New Delhi: Rupa Publications.

[6] Nordrum, Amy, and Kristen Clark. 2017. *Everything You Need to Know About 5G.* January 27. https://spectrum.ieee.org/video/telecom/wireless/everything-you-need-to-know-about-5g.

[7] Oughton, Edward, J, and Zoraida Frias. 2018. "The cost, coverage and rollout implications of 5G infrastructure in Britain." *Telecommunications Policy* 636-652.

connect devices simultaneously and send them to the nearest *Massive MIMO*. Massive MIMO is an augmentation of hundreds of large antennae at a single tower. Such a large collection makes the transfer of large data packets possible. This makes the periphery of the 5G infrastructure.

3. Another technique is beamforming. This technique identifies a unique path for a signal to get transmitted efficiently. Similar to that of Google maps, the beamforming algorithm gives the signal best route to its destination.

4. The last technique is the Full Duplex. It makes a user receive and dial a call simultaneously. On a single spectrum, data can simultaneously go in two directions.

All these techniques are used to reduce the latency and increase the speed which is the core functionality of 5G. The utility of 5G is huge. It forms a base for all the upcoming technological revolutions. Driverless cars, AI systems, Internet of Things, Hologram based meetings, virtual reality will seamlessly function (if not be enabled) with 5G. World Economic Forum's paper describes five functional drivers set to accelerate the digitization of the world. These functional drivers reshape economies, societies, the military and cultures through an unparalleled level of connectivity.[8]

Box I: An excerpt from WWF white paper on the impact of 5G (World Economic Forum 2020)

Five key functional drivers of 5G support certain technological applications.

1) Enhanced mobile broadband;

2) Ultra-reliable low latency communication;

3) Security;

4) Massive machine-type communications; and

5) Power efficiency. Most (93%) of the use cases analyzed would be enhanced by ultra-reliable low latency communication and 78% by enhanced mobile broadband. Massive machine-type communications and security are also important, with each driver contributing to 45% of the use cases analyzed.

Vulnerabilities

The moment 5G kicks in, all the applications including a country's critical infrastructure like health care system, nuclear sites, and defence sites will be compromised. This is because the data flow is not centrally controlled but distributed across many servers. Any compromise of a single server can leak peta-bytes of data and would be difficult to trace.

Lack of proper legislations related to data will make a country vulnerable to data theft. If a country's citizen's data is accessed by another country, the latter can effectively control the

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[8] Umbach, Frank. 2020. "EU POLICIES ON HUAWEI AND 5G WIRELESS NETWORKS ECONOMIC–TECHNOLOGICAL OPPORTUNITIES VS CYBERSECURITY RISKS."

behaviour of the public. Such control is termed perception control.[9] The phenomenon of a state being subjugated by the data outflow is termed *data colonization.*[10]

Currently, all the telecommunications operators use megahertz bandwidth to provide their 4G LTE bandwidth. The millimetre wavelength remains unused. Bandwidth auction perhaps may remain the same for the 5G bidders which is not a cause of concern. However, infrastructure deployment is a challenge here. 5G technology deployment hinges on the maximum usage of infrastructure, be it small cells or massive MIMO towers. If each telecom provider installs their MIMO towers and small cells, the capital costs of the companies would significantly rise and the density of the infrastructure would make the environment clumsy. This issue asks for shared usage of the infrastructure.[11] When a single infrastructure will be shared, without any rules and regulations, any foreign company can get access to the infrastructure and once they get hold of the spectrum, data can be copied to the external servers without interfering with the efficiency of the communications.

5G networks are managed primarily by software, and therefore, the entire network system and its applications need cybersecurity. Moreover, single point procurement of 5G infrastructure from, say, Huawei, could result in central failure of the communications network.[12] One point of breach into the system could result in the failure of the entire service sector, given the scope of 5G. Huawei's hardware-centric development makes its clients use specific hardware parts making the 5G systems operate under strict logistic support. It will not have much flexibility in terms of adapting to different cybersecurity measures.

5G technology cannot be neglected or delayed for economic reasons. It has immense potential to change the socio-economic processes of societies. Besides, it also has potential vulnerabilities which compromise the security, the sovereignty of a state. There must be a greater focus on emerging technology to enhance national security.[13] For the UK's interests, having control over technology development and deployment will decide the level of control its government has on its citizens or at least the narratives carried into the phones of an individual. To protect "national interest," states have to securitize the development and deployment of 5G. One such development in geopolitics is the UK's call for D10 group.

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[9] Susskind, Jamie. 2018. *Future politics: Living together in a world transformed by tech.* . Oxford University Press.

[10] Malhotra, Rajiv. 2021. *Artificial Intelligence and the Future of Power*

[11] Oughton, Edward, J, and Zoraida Frias. 2018. "The cost, coverage and rollout implications of 5G infrastructure in Britain." *Telecommunications Policy*: pg. 640

[12] Hoffmann, Stacie, Bradshaw Samantha, and Taylor Emily. 2019. "Networks and Geopolitics: How great power rivalries infected 5G."

[13] Ellehuus, Rachel. 2020. "The UK Integrated Security and Defense Review Opportunity amid Chaos?" *Center for Strategic and International Studies* . August. https://www.jstor.org/stable/resrep2566

UK'S PROPOSAL OF D10

Post-Brexit, should Britain assert itself as the regional power whose scope ranges from the Arctic to West Asia? Or should it rejuvenate its past glory of global power? For the UK to be at least one of the above, it has to focus on the emerging new factors like 5G and AI to establish its prowess. The UK proposed a balancing strategy called the D-10 to secure itself from the vulnerabilities of 5G. It is a grouping of G7 countries along with Australia, the Republic of Korea, and India proposed to counter the Chinese firm Huawei from taking the lead in deploying its 5G technology.[14] The other reason for the proposal of D10 is claimed to be to operate global critical supply chains freely among the democracies.[15] In the global market, Huawei has become a sole supplier of 5G technology at a cheaper cost when compared to Nokia and Ericson. To avoid Huawei having a monopoly, D10 is a grouping that provides an alternative. However, such a grouping of democracies and shared values is a narrative of the Cold War era. In such a case, to uphold the democratic institutions across the globe, the western powers, especially should not restrict themselves to small western groups like G7. Rather they should decide an entry factor for the countries to be a part of the grouping like D10.

Other engagements from the UK on Science & Technology

The United Kingdom has a Scientific and Technological Cooperation Agreement with the United States.[16] Under this agreement, scientific data and results are exchanged between the two countries without any restrictions. Even the equipment used for research purposes is duty-free. This agreement is extended to enable research cooperation in Artificial Intelligence.[17] The presence of such an agreement would dent the D10 grouping as the US and UK together will have an unfair advantage. Post-Brexit, UK must revamp its science & Technology strategy. The D10 is a good start, however, it will have some difficulties.

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[14] Khanna, Aditi. 2020. *UK plans new 5G club of 10 democracies, including India: Report.* May 29. https://www.livemint.com/news/india/uk-plans-new-5g-club-of-10-democracies-including-india-report-11590759252503.html.

[15] Erik Brattberg, Ben Judah. 2020. *Forget the G-7, Build the D-10.* June 10. https://foreignpolicy.com/2020/06/10/g7-d10-democracy-trump-europe/.

[16] Foreign & Common Wealth Office. 2017. "Agreement between the Government of the United Kingdom of Great Britain and Northern Ireland and the Government of the United States of America on Scientific and Technological Cooperation." *Gov.uk.* November 30. https://www.gov.uk/government/publications/ts-no252017-ukusa-agreement-on-scientific-and-technological-cooperation.

[17] Bureau of Ocean and International Environment and Scientific Affairs. 2020. "Declaration of the United States of America and the United Kingdom of Great Britain and Northern Ireland on Cooperation in Artificial Intelligence Research and Development: A Shared Vision for Driving Technological Breakthroughs in Artificial Intelligence." *US Department of State.* September 25. https://www.state.gov/declaration-of-the-united-states-of-america-and-the-united-kingdom-of-great-britain-and-northern-ireland-on-cooperation-in-artificial-intelligence-research-and-development-a-shared-vision-for-driving/.

DIFFICULTIES OF D10

South Korea is on the list of D10, is seen as strategic country for Western interest in halting the rise of China in the technology tussle. However, for South Korea, joining a grouping like D10 would prove to be self-damaging. Because of its close geographical proximity, it is more economically and culturally interlinked with China than other proposed D10 members.[18] Its information technology sector has close trade ties with Chinese companies including the fact that it exports more electronics to China than the US. This makes South Korean membership in D10 a self-serving initiative for the Western powers but not for South Korea.

The UK is expected to achieve 90% of 5G coverage by 2030.[19] A key method to reduce the costs of the 5G infrastructure rollout is via infrastructure sharing. That means that irrespective of who is the vendor of 5G technology, the telecom service providers should share the small cells and MIMO base stations to reduce their capital costs. It appears that if this is not followed, they cannot match the low-cost appeal made by Huawei. If sharing is encouraged, auditing the data flows will become a much more cumbersome process. Having numerous applications on the network asks for different auditing process regarding the data flows. Within the D10 countries, there are applications specifically designed or remodelled to serve specific publics. Proper auditing requires regulation by design – incorporating regulations at the development stages of 5G infrastructure. For D10 to implement the regulation by design, it may have to restrict market access for 5G companies via auditing, which is not acceptable for the latter.

Chinese foreign minister Wang Yi unveiled China's Global Initiative for Data Security (GIDS) on September 8, 2020. China is likely to introduce it in the next UNGA general assembly. The proposal on paper emphasizes data security, cyber sovereignty, and free global digital supply chain. It condemns the usage of ICT technologies for mass surveillance of other states.[20] This last element acts as a counter to the UK's D10 proposal. If China follows what it proposes in letter and spirit, D10 would become less attractive. current discussions within the Indian government are focused on the GIDS rather than D10.[21] If India, one of the major players within D10, is showing an inclination towards GIDS (or sidelining D10), it would be difficult for D10 to realize its objective.

If the D10 grouping developed security measures for the 5G deployment, issues like spectrum allocation would ask D10 to operate on the sliced market. If the global service providers and states are at loggerheads in deciding a global spectrum, they would end up operating on varied

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[18] Hemmings, John, and Sungmin Cho. 2020. *South Korea's Growing 5G Dilemma.* July. https://www.jstor.org/stable/pdf/resrep25233.pdf.

[19] Oughton, Edward, J, and Zoraida Frias. 2018. "The cost, coverage and rollout implications of 5G infrastructure in Britain."
[20] Ministry of Foreign Affairs. 2020. *Global Initiative on Data Security.* September 9. https://www.fmprc.gov.cn/mfa_eng/zxxx_662805/t1812951.shtml.

[21] Based on personal correspondence with a consultant with the Ministry of External Affairs (MEA, India). The source is kept anonymous for security reasons.

frequencies.[22] For example, Brazil cannot be accessed by India, UK, and even the US, because Huawei is Brazil's 5G provider and they operate on a different spectrum than D10.

CONCLUSION

While it is true that allowing Huawei to install a 5G infrastructure would assist in data outflows to China, the rise of China may not be a threat to the world as opined by Western media and scholars. From the Edward Snowden files, we know that the US has been doing the same with the countries around the world for decades.[23] Had this known decade earlier, the rise of the US post World War would been seen as a great threat to the entire world. But people have accepted its rise as an opportunity to grow. In a TV show *Round Table*, Senior Lecturer, Winnie King of the University of Bristol says that the US should not focus on regional hinges like Australia, India, South Korea, and Japan to stop China's growing influence.[24] It could do well by expanding the permanent council of UN Security Council. Some argue that the UNSC permanent council should not be a large body. At the same time, it cannot be left to few powers which makes the world structure hierarchical institutionally. Narratives on the necessities to counter Chinese supported Huawei show that if China is successful in promoting its technology, it could unduly influence international bodies like the UN. Such development within international institutions would undermine the Western states' power and influence.[25] It appears that the narrative on the 5G technology and the protection of the liberal world is a façade to push forward the Western powers' agenda. The imperative is to ask what this tussle between China and Western power brings to the developing world. Even for the UK, the economic strain from an Integrated Defense Review would seriously undermine its efforts to have strict control over the emerging technologies. From this aspect, a successful D10 would help to share the financial burden and while emerging as an alternative to the 5G technology being provided by the Chinese firm Huawei. However, for this scenario to succeed, all the proposed members should have the same concern regarding their budgets. On the final note, it would be better to look at the possibility of the developing world's alternatives to D10 or GIDS. The Indian government has issued an Expression of Interest on 15, December 2020 regarding the

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[22] Hoffmann, Stacie, Bradshaw Samantha, and Taylor Emily. 2019. "Networks and Geopolitics: How great power rivalries infected 5G."

[23] Evan Mecaskill, Gabriel Dance. 2013. "NSA Files Decoded: What they Mean for You?" *The Guardian.* November 1. https://www.theguardian.com/world/interactive/2013/nov/01/snowden-nsa-files-surveillance-revelations-decoded#section/1.

[24] Roundtable. 2020. *G-7 to D-10: Can Leading Nations get it Together?* August 20. https://www.youtube.com/watch?v=yX4MpATkAVE.

[25] Umbach, Frank. 2020. "EU POLICIES ON HUAWEI AND 5G WIRELESS NETWORKS ECONOMIC–TECHNOLOGICAL OPPORTUNITIES VS CYBERSECURITY RISKS."

establishment of semi-conductor fabrication facilities. [26] There are not many fabrication facilities across the world and none in developing countries. If India becomes a hub providing semi-conductions fabrication facilities, then in future, the tussle over technology between the US and China will have an alternative in India. If such initiatives are encouraged by D10, no doubt it would gain many supporters from the developing world.

[26] Choudary, Ambika. 2020. *India Is Getting Ready For Mass Production Of Semiconductor Chips.* December 16. https://analyticsindiamag.com/india-is-getting-ready-for-mass-production-of-semiconductor-chips/.

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