

**Technology & Geopolitics**

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1. **Introduction**

Geopolitics and technology have a longstanding connection throughout history. The level of technological superiority of one state over another has always played a decisive role in the outcome of conflicts. The relationship between the global political, economic, and diplomatic dynamics and the advancement in technology is one of utmost importance in the world of today. Technology has always been an important tool in influencing politics, military activities, deterrence, warfighting, and peacemaking. Historically, technological innovation was associated with military might and hard power. However, in the present, states leverage technology for soft power projection as well, and to engage in the Grey War, which is an unconventional form of conflict. The question arises that how did technology come to be one of the most significant players in shaping the geopolitics of today? The answer lies in nations’ behavior of leveraging technology for economic and diplomatic benefits for their country. The increasing importance of technology in shaping geopolitics can be mainly attributed to its impact on economic and diplomatic realms. Nations with superior technology acquire a competitive advantage, which affects trade as well as their worldwide influence. Information and communication technologies (ICT), primarily through social media, have revolutionized how information is disseminated, enabling governments to engage in information warfare and reach a global audience on an unprecedented scale. Apart from conventional technological realms, geopolitical issues are also being redefined by developments in energy, infrastructure, and space technology. Global affairs are shaped when cooperative tech-based alliances promote relations between nations and offer ways to address global concerns. Another factor that contributed to the cementing of technological innovation as an influential force in geopolitics is the emergence of innovation hubs like tech valleys and science and technology parks all over the world. These hubs brought with them a culture of bold and unorthodox ideas and promoted visionaries. Silicon Valley, known as the world's foremost center of technological innovation, is an example of such hubs which attracts unconventional thinkers and visionaries from all over the world. It is widely recognized as a place free from established workplace norms, social conventions, or hierarchical structures. In the tech industry, meritocracy reigns supreme, where creativity and originality take precedence over traditional credentials. The founder of Apple, Steve Jobs, in a legendary speech, which also later came to be used in the branding for Apple, once said: "The people who are crazy enough to think they can change the world are the ones who do." This concept has heavily inspired tech giants, and the technologically advanced world we see today is a testament to the impact of great ideas in bringing about transformative change. These tech giants are increasingly influencing geopolitics in various ways. They have enormous ability to shape public opinion and the direction of political debate because they control the information flow entirely in the digital world, which translates into the real world as well with the high accessibility of technology among people. They are also competing for supremacy in important fields like quantum computing, 5G, and artificial intelligence, which in the future may translate into major conflicts among nations. Ultimately, whoever controls these technologies will have a huge edge in the global economic and geopolitical landscape. This is a challenge because information is not easy to control in the world of today. Londsdale (1999)[[1]](#footnote-1) observes in his article that the other forms of strategic power: sea, land, air, and space, all have their own physical environments which have unique characteristics. The nature of each environment determines to a degree how the corresponding power can be utilized. However, information power, which is the fifth dimension, operates within an environment which is best defined as the 'infosphere'. Due to its ethereal nature the infosphere does not take easily to any concrete definition, and hence, without a concrete and commonly accepted definition, it is not easy to control this form of strategic power.

1. **The Geopolitical Influence of Technology**

During the early period of Japanese success in World War 2, Field Marshall Slim, a British military commander, noted that during his campaign in Burma, they had practically no useful or reliable information of the enemy’s strengths, movements, or intentions while the Japanese had ample information on their adversary’s strategy, and this advantage was contributing significantly to the Japanese’ success[[2]](#footnote-2). This account is a relevant piece of history which emphasizes the importance of information in warfare. Information power is now not only being used in conventional warfare but also in economic warfare, cultural warfare, intelligence operations, cyber-attacks, and much more. Information continues to be a powerful weapon in all kinds of conflicts between nations. During the Cold War, both the United States and the Soviet Union were engaged in a global struggle for power and influence. The countries used a variety of methods to try to undermine the other and gain supremacy. These methods included but were not limited to propaganda, disinformation, and psychological warfare. The modes of communication in those times were not as advanced or sophisticated as those widely available today yet the disinformation campaigns proved to be highly effective. Radio transmission was one of the key propaganda techniques used throughout the Cold War. The Voice of America (VOA) and Radio Free Europe (RFE), two radio stations that broadcast news and information to viewers behind the *Iron Curtain*, were established by the United States. The VOA and RFE were very successful in reaching their target audiences. In the Soviet Union, the VOA was estimated to have a weekly audience of over 100 million people. These stations played a significant role in undermining the Soviet regime and helping to bring about its collapse[[3]](#footnote-3).

The age of social media has dramatically transformed the infosphere. Earlier technologies like the radio were unidirectional in design while social media is interactive. Listeners were only being passively being affected through earlier technologies, while social media allows a person to directly engage and interact with the information. Due to the large volume and velocity of data, truth and falsehood have become tremendously hard to distinguish. Moreover, while some countries have actively tried to create filters and regulate the content the public sees on social media, it is impossible to gain full control of the information accessible over the internet due to the sheer volume of information, the speed at which it is being propagated, and the ability for any user to manipulate the information and disseminate it further.

During the decade of 2010s, cyber-attacks emerged as a prevalent tool employed by various nations in Europe to use against each other. These attacks involved the use of computer systems and social media to target government organizations and the mainstream media as a pressure tactic to exert the influence of one country over another. As technology developed, cyber-attacks grew more sophisticated and were used for a variety of objectives, including data theft, sabotage, and espionage. The Estonian cyber-attacks of 2007 were one such incident. A number of significant DDoS\* assaults against Estonia's media, financial institutions, and government occurred in 2007. The attacks, which were attributed to Russia, generated fears about the EU's possible use of cyberwarfare[[4]](#footnote-4).

The fault-lines in the infosphere became more evident in the U.S. Presidential Elections of 2016 when it was widely claimed that an organization linked to the Russian government had used Google's platforms and services for disinformation campaigns. Concerns about cybersecurity and exposure to foreign intervention were raised in Silicon Valley after it was discovered that foreign governments are possibly funding technological attacks on democratic processes. Silicon Valley technologists remember this as a rude awakening for engineers, managers, and other experts, acknowledging that the internet had transformed into a battleground for geopolitical conflicts, and the cost of staying oblivious to this fact had become exceedingly high for any technologist.

The same pattern repeated itself in the 2020 U.S. Presidential Elections. It was claimed that Russian hackers targeted the networks of Joe Biden's campaign consultants and state and local election systems. A New York Post article peddled claims about Biden's son Hunter Biden being involved in corrupt business deals[[5]](#footnote-5). It was said that Facebook users were engaging with more disinformation in 2020 than they had before the 2016 election. President Trump had claimed that the election would be rigged, which furthered the opportunity for interference and disinformation.

1. **Global Technological Competition**

More recent geopolitical developments like the Russia-Ukraine War and U.S.-China tensions over Taiwan have also reinforced the significance of technology in shaping global affairs. When the Russia-Ukraine conflict began in February 2022, the U.S. Intelligence Committee predicted that Kyiv could fall to Russia within days. Ukraine was severely outnumbered in all conventional terms i.e. in terms of manpower and weaponry. However, Ukraine held a technological advantage over Russia, and it made full use of this edge. As soon as the invasion began, Ukraine uploaded all its critical data to the cloud so they would have back-up in case of a cyber-attack. Ukraine also received significant military assistance from the West, which included advanced weapons and technology like drones through which the Ukrainian army was able to receive real-time intelligence. Moreover, Ukraine has also been very effective in using social media to its advantage. The Ukrainian government has used social media to spread pro-Ukrainian propaganda and to mobilize international support. Ukraine's government raised cryptocurrency worth almost $13 million after posting appeals on social media for donations of bitcoin and other digital tokens, according to data from blockchain analysis firm Elliptic[[6]](#footnote-6).

Similarly, the U.S.-China conflict over Taiwan (also known as the Tech War) is an ongoing competition between the two countries in the field of technology, among other things. There are multiple facets to this competition, and it includes both, military and commercial aspects. As far as the commercial aspect is concerned, the United States and China are competing for supremacy primarily in the field of semiconductors. Taiwan produces the world’s most advanced memory chips, which is the brain of every modern technology like smartphones, cars, and even fighter jets. In the case this competition develops into a military conflict, it can have devastating consequences for the global economy. Both countries compete for access to key technological components. The situation is made more complicated by Taiwan's political position, which China claims as a part of its territory and US support of its democratic government. President Joe Biden has also often said he would intervene to defend Taiwan in any military conflict. Due to a combination of economic interests, security concerns, and political dynamics, this struggle has enormous ramifications for both regional stability and global geopolitics. The competition over Taiwan's technology will continue to be a major issue in the Indo-Pacific area since technology is so important in determining the dynamics of world power. The trajectory of global technological leadership in the twenty-first century depends on diplomatic efforts to control conflicts and find peaceful solutions to sustain stability.

1. **Technological Dependence and Sovereignty**

Technological dependence refers to how much a country depends on foreign technology to effectively run its political, military, and economic systems. A nation may always be at risk if it is technologically dependent since it may be more vulnerable to political manipulation, military threats, and economic sanctions by other countries. From an economic perspective, a country may experience financial instability if its economy depends too heavily on technologies from another country. If the country is relying on foreign companies for its essential goods and services, the country's economy may be disrupted if these corporations were to stop supporting it due to some reason. Moreover, developing countries which are not technologically advanced often import licenses for various software. Importing software licenses from foreign countries can be a costly and inefficient way to acquire the software. The cost of software licenses can be high, especially for countries and organizations with limited financial resources. Therefore, it is a good practice especially for developing nations to invest in their own workforce and develop the required software locally. From a military perspective, technological dependence on foreign countries for advanced weaponry or equipment can put the country at a considerable disadvantage if the said foreign country withdraws their support amidst a military conflict. Consequently, technological dependence can make it more difficult for a nation to control its borders and to protect its critical infrastructure.

In order to mitigate these risks, nations should focus on developing their own indigenous technology, invest in research and development, and strengthen their cybersecurity infrastructure.

1. **China’s Digital Silk Road**

China’s Digital Silk Road, also known as the Digital Belt and Road Initiative, is a project of the Belt and Road Initiative (BRI) that aims to digitally connect countries under the BRI and equip those countries with latest technologies. While the initiative was undertaken and is currently being led by the Chinese Government, a large number of Chinese private companies are also a part of this project. Both state-owned enterprises and private corporations in China are investing heavily in emerging technologies like 5G technology and artificial intelligence (AI) to establish China as a global leader in technology. China’s Digital Silk Road comprises four interrelated initiatives[[7]](#footnote-7):

1. Investment in digital infrastructure/emerging technologies in other countries.
2. Developing advanced technologies to strengthen its own economy and military.
3. Promoting E-commerce under the BRI through digital free trade zones. Digital free trade zones are special economic zones in the digital space that offer special benefits like reduced taxes, access to better digital infrastructure, and more.
4. Shaping the international digital space through digital diplomacy and engagement with multilateral institutions.

While the Digital Silk Road is an excellent initiative for not only China’s technological and economic development but also for all BRI countries, it is also a diplomatic masterstroke as China has started to make its presence felt on the global technological front.

The United States is currently leading the satellite-based navigation systems technologies with its Global Positioning System (GPS), however, China’s global navigation system, BeiDou, is now gaining traction among the BRI-participant countries. Currently, the BeiDou system is integrated in 30 BRI countries. These countries, including Pakistan, are important regional actors thus this increasing foothold of Chinese technologies is a source of tensions between the United States and China. Due to security concerns, the United States has been waging a diplomatic effort to stop Chinese companies from providing equipment for vital digital infrastructure. The establishment of 5G technology by Chinese corporations is currently being contested by businesses, and the United States and a number of allies, including Australia, New Zealand, and Japan, have put in place measures that essentially bar Huawei and other Chinese companies from supplying parts for the development of 5G networks.

The eventual impact of China’s efforts to emerge as the sole technological superpower depends upon how these developments progress and how other nations who feel threatened by these efforts respond. It is unlikely that the United States and China can coexist in their own spheres of influence without any conflict, military or otherwise. The refusal of some allies of the U.S. to ban 5G Chinese-manufactured components in their 5G networks is already a potential source of conflict.

1. **Opportunities for Pakistan**

Pakistan has a number of opportunities to benefit from the Digital Silk Road initiative of China. The CPEC project between China and Pakistan includes the construction of roads, railways, and power plants. The Digital Silk Road could help to connect the CPEC with other digital infrastructure projects in the region. This would make it easier for businesses to trade and invest in the region, and it would also improve connectivity between people and businesses in Pakistan and other countries along the Belt and Road. One of the most notable projects that have been completed under the Digital Silk Road initiative was the China-Pakistan Fiber Optic Project. The 820-kilometer optic fiber cable runs from Rawalpindi to the Khunjerab Pass on the Pakistan-China border. Although Pakistan and China finalized the deal in 2013, the China Pakistan Economic Corridor saw the project through to completion. The project, which was completed in 2018, provided the Gilgit-Baltistan area access to 3G and 4G connection. The next phase of this project involves laying a fiber optic cable between Rawalpindi and the port cities of Karachi and Gwadar. The $240 million project is in partnership with China's Huawei Technologies and was approved by the government on January 21, 2021. It will also connect with the PEACE cable in the Arabian Sea[[8]](#footnote-8). Significant investments in physical infrastructure, including as fiber-optic cables and data centers, are needed to build the Digital Silk Road. Pakistan now has the chance of improving its own infrastructure and modernize its communications systems. Other industries, including transportation and energy, may see spillover effects from such development, which would advance the nation's economic growth.   
Moreover, there are many special economic zones (SEZs) in Pakistan which offer reduced taxes and other incentives to enterprises. By giving SEZs access to advanced digital infrastructure and technology, the Digital Silk Road may help in drawing investment into these areas. This will facilitate business establishment in SEZs and contribute to job growth in Pakistan. Another opportunity lies in the field of e-commerce. E-commerce market in Pakistan is expanding. By giving enterprises access to Chinese technology and knowledge, the Digital Silk Road may contribute to the growth of the e-commerce industry. Businesses would find it simpler to sell their goods online as a result, and Pakistan's e-commerce industry would function more effectively as a result. The Digital Silk Road could help to create new opportunities the large pool of skilled IT professionals in Pakistan by providing them with access to Chinese markets. This would help in boosting the IT sector in Pakistan and the creation of new jobs. From a geopolitical perspective, The Digital Silk Road initiative places Pakistan in a critical partner role in China's goals for global connectivity and technology. This strategic significance may result in stronger diplomatic relations and geopolitical influence for Pakistan. Pakistan's involvement in the Digital Silk Road could potentially be regarded as a strategic effort to constrain India's dominance in the region. The initiative strengthens Pakistan's status as a major player in South Asia because of the potential of linking China to Africa and Europe via Pakistan. This may balance India's expanding geopolitical and economic influence in the region. However, to take full advantage of this strategic initiative, Pakistan would need to navigate the geopolitical complexities and ensure the protection of its national interests. Pakistan can maximize the benefits of its participation in the Digital Silk Road by maintaining a balanced strategy and establishing cooperative alliances.

1. **Conclusion**

Technology has played a pivotal role in shaping geopolitics throughout history and continues to do so today. From the use of radio and leaflets in the Cold War, to the internet and social media campaigns of today, technological advancements have transformed the way nations interact, communicate, and exert power on the global stage. As the world becomes more and more reliant on technology, the future of warfare and geopolitics will undoubtedly be determined by technological innovation.

For Pakistan, recognizing the transformative role of technology in geopolitics is crucial. To emerge as a successful nation in this digital age, to promote indigenous technological innovations and create a solid knowledge base, investment in research and development is essential. Moreover, maintaining strategic alliances and partnerships with technologically advanced countries can open avenues for knowledge sharing, access to advanced technologies, and collaborative ventures. Strong diplomatic connections with nations that are at the forefront of science and technology, such as China, may help Pakistan take use of global experience to address pressing issues and strengthen its competitive edge. Pakistan should aim for a certain degree of technological independence while simultaneously exploring cooperation with other states. Reduced reliance on technology from foreign countries and organizations can strengthen national security and with the reduced financial burden of exporting software/licenses, it can help boost the country’s economy.

As the global dependence on technology grows, countries who are able to fully realize its potential will become significant players on the global level. Pakistan must put its national interests first, make investments in R&D, form partnerships, and move towards technological independence if it is to effectively navigate this complex environment. Pakistan can establish itself as a strong and significant player in the geopolitics of the digital age by taking a comprehensive and forward-thinking approach to technology.

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2. Robert B. Asprey, War in the Shadows, 2nd ed. (London: Little, Brown 1994) p.419. [↑](#footnote-ref-2)
3. RAND Corporation. (1996). Information warfare: A new face of war. Santa Monica, CA: RAND.

   \*A DDoS attack, or Distributed Denial of Service Attack, refers to a malicious kind of cyber-attack that aims to overload a network or website with an excessive amount of traffic in order to prevent it from functioning effectively. [↑](#footnote-ref-3)
4. Harding, Luke. "Estonia hit by 'Moscow cyber war'." The Guardian, May 17, 2007. <https://www.theguardian.com/world/2007/may/17/topstories3.russia>. [↑](#footnote-ref-4)
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8. Nikkei Asia. "China builds Digital Silk Road in Pakistan to Africa and Europe." [↑](#footnote-ref-8)