

Impact of Technology on the Security of States: A Case Study of China

Ronaque Ali Behan*

Dr Naureen Nazar Soomro[†]

Dr Ali Gul Khushk[‡]

Abstract

Advancement in information and communication technology has brought a revolutionary change around the world. The impact of technology has left tremendous impact on every aspect of life in multiple ways. It has become integral part of all types of interactions. Similarly, relations among the states and their affairs have also been shaped and influenced by the impact of technology. It has also posed challenges to the security of states. Hitherto, states relied on the traditional forces/weapons for maintaining their defence. Now, no state can afford to rely on the old methods of defence. Thus, in order to cope with the emerging security challenges posed by the technological implications, States have modernised their militaries resulting in arms race, military build-ups, with consequent impact on their economies. China is one of those states, which has been affected by the arms race among the major powers. Consequently, China had no option but to modernise its weapons and military, and divert significant amount of its annual budget to the defence and research and development. This paper discusses the impact of technology on the relations of states in general and the resultant security challenges that technology has created for China in particular. The paper also discusses the future of China under the influence of technology. Before conclusion, paper suggests some measures to address the security challenges posed to the Chinese Security brought out by technology.

Key Words: Technology, Nation States, Security of China

*Lecturer, Area Study Centre, Far East & Southeast Asia, University of Sindh, Email: ronaq.ali@usindh.edu.pk (Corresponding Author)

[†]Assistant Professor, Area Study Centre, Far East & Southeast Asia, University of Sindh, Jamshoro, Pakistan. Email: naureen@usindh.edu.pk

[‡]Assistant Professor, Department of Economics, University of Sindh, Jamshoro, Pakistan.

Introduction

Security is the key objective of every state to survive in the international system, which is anarchic in nature. No state in the world can survive without maintaining satisfactory security architecture. The nations for their security, throughout history, have depended on the skills and techniques available to their warriors and leaders. In recent times, the rapid advancement of technology in every field of life including weapons and war-fighting strategies, are causing threats to the well-being and sovereignty of the nation states. Thus, technology remains the major instrument in maintaining the security of a state against other states. Third world countries are struggling to keep pace with the advanced countries by means of advancing technology. The technology, no matter having various negative implications along with positive ones, has become unavoidable in today's interdependent and globalised world (Mallik, 2004).

The security architecture of the states has evolved through various stages, undergone various changes under the influence of changing security environment (Kluz & Firlej, 2015). Technology has played significant role in the security of states throughout the history. On the one hand, technology has facilitated two-way interaction between states and played significant role in the economic development of the countries. On the other hand, it has created friction among the countries in their pursuit of security, development and progress. Additionally, it has created number of challenges for the states to deal with. One of such major challenges is the threat to the security of a state. Contrary to the traditional defence system, compelled by the changed security environment, every state has drastically revised its defence policy.

Background and Literature Review

Before the period of renaissance and resultant scientific revolution,

sword, spear, arrow, and other manual tools such as “claws of Archimedes” (Samuels, 2011: 40) were the main weapons of war. However, after the invention of gunpowder by China, the old tools of war fighting were replaced by gun, rifle and other latest weaponry (Marshall, 2009). In the later phases, the more advanced and upgraded weapons were developed like Machine Guns, Rockets, etc. During the late 19th and early 20th century, the world witnessed a dramatic change in the war machinery. After the unprecedented advancement in technology, the countries developed most dangerous and lethal weapons in the history of mankind (Tunis, 1999; and O’Bryan, 2013). During this period, scientists started to develop nuclear weapons and soon after the World War I many states were able to develop nuclear weapons and United States of America was the first state to acquire and use nuclear weapons in 1945 (Hacker & Vining, 2006; Marshall, 2009). This dramatic change in the war machinery generated multiple effects around the world.

Firstly, the security of the states became vulnerable and they were compelled to review and redesign their security policies. In order to maintain balance of power, states were engaged in arms race. States developed new strategies, policies and tools to cope with these technology-driven challenges (Fritsch, 2016). After the Second World War, USA and the former Soviet Union emerged as the super powers of the world. The world become bi-polar in nature. However, there existed power asymmetry between USA and USSR. Having the mighty nuclear power USA was considered more powerful than the USSR. Thus, arms race started between them to maintain balance of power. Ultimately, USSR also acquired nuclear weapons in 1949 and symmetrical power relationship continued between the two states until the disintegration of USSR in 1991.

Secondly, in the response to the changed security environment, states started to build up armies, military modernization programmes, thus, diverting major share of their national budgets to

the defence resulting in negative effects on their economic development. According to Stockholm International Peace Research Institute (SIPRI) many countries have increased their military spending in the wake of changing security environment. USA remained largest military spender of the world in 2016 with \$611 billion with China being the second largest military spender with \$215 billion (SIPRI, 2016).

Thirdly, peace and stability became hostage under the shadow of arms race for maintaining balance of power. In the quest for maintaining balance of power, peace and stability was the ultimate sufferer. Race between Pakistan and India to maintain balance of power in the region has created fears of an unfortunate incident of war between them (Mishali-Ram, 2019). Many a times they have come at the brink of war but avoided thanks to external interference (Ganguly & Hagerty, 2012; Carranza, 2016). Hence, the peace and stability of the South Asian region has remained under threat from the arms race designed to maintain balance of power.

Fourthly, with the invention of lethal weapons, the theatre of war was shifted from battlefield to the civilian population. Initially, the war was confined to battleground and only soldiers were the targets of enemy but now in presence of sophisticated weapons the enemy is able to target whole population making it more destructive in nature. Not only the number of civilian casualties has multiplied but in the process whole infrastructure is destroyed leaving the long term and devastating effects on the life of the people. Devastative and destructive nuclear attack on Japan during the Second World War is the hair-raising story of the lethality of these types of weapons developed under the influence of technological advancement. Hence, in the nuclear age, war has become a zero-sum game and its nature has become even more destructive. In the presence of these weapons, security of states remains constantly vulnerable due to the ever-changing security environment. States are continuously engaged to upgrade their stock of weapons to

equalize their power with the enemy/adversary states.

After the successful testing of nuclear weapons by USA, its contemporary power the then USSR raised security concerns, consequently, acquired the nuclear weapons (Hacker & Vining, 2006). This chain of reactions did not stop there and many other states also expressed security concerns and consequently acquired these weapons including UK, France and China. In the later entry Israel, India and Pakistan also jumped into the fray (Mishali-Ram, 2019) expressing their own security concerns. North Korea is the latest entry in the nuclear club (Reohrig, 2016). Many other countries of the world are also believed to have acquired capacity to develop nuclear weapons and few states are clandestinely working to achieve them. Thus, quest for nuclear weapons started from one state and proliferated around the world.

Similarly, soon after the acquisition of nuclear weapons, race for missile technology started and now we can witness availability of missiles with many countries of the world. They range from short range to medium and larger range known as ballistic missiles. Anti-ballistic missile system is the latest weapons, which has again challenged the security architecture of many states. Now states are busy to acquire more effective and latest ABM system to shield their land from ballistic missile attacks (Moore, 2014).

Cyber war is the new security challenge the countries of the world are faced with. This is the new and latest challenge that the technology has posed to the security of the states (Rid, 2011). Now enemy is using software power to penetrate into the software systems of the adversary states. After capturing it, they destroy the command system and gets control over the control room, and extracts secret information, misreport and manipulate information even may guide missile and other weapons to other states to create animosity and destabilize the region. Terrorist organisations are more akin to achieve this target (Lewis, 2002).

Precision Guided Munitions (PGM) is the latest example of technological superiority in arms build-up. Munitions is guided through precision weapons to avoid casualties and collateral damage and to inflict major damages to enemy. These types of weapons are guided by satellite navigation, laser guidance, high-definition radars, advanced seekers and other technologies. It enhances the capability of a state to target effectively inflicting major damages with minor casualties in reaction. It enables a state to get swift and decisive victory over enemy. Thus, technology has created many challenges and opened many war fronts for the security of the states on the one hand and Technological prowess has enabled powerful countries to get decisive victory over lesser powerful countries in the war history on the other hand. Gulf war is an outstanding example where technological superiority in military power enabled USA to get decisive victory over Iraq. The one-sided victory in the Gulf War has been primarily attributed to technical advantages, which supported the coalition in its overall conventional military superiority (Cheung, Mahnken & Ross, 2014).

Research Methodology

This is a qualitative research, which focuses on the impact of technology on the security of the states with particular focus on the technological impact on China and its response. In this research, secondary sources have been employed to collect the data regarding the topic. The content analysis method has been used to analyse the data collected through secondary sources, which include books, monographs, research journals, official and government reports and newspaper articles.

Significance of the Study

The significance of the study lies in the fact that security is the utmost priority of modern states. Hence, the paper identifies the impact of use of modern technology on the security of states in general

and security of China in particular. Identification and development of the ways and mechanism to reduce the negative impacts of the use of modern technology will assist the nation states in ensuring their security in globalized world of today. The present paper, while studying the negative impact of technology on security of states, has identified the positive impact of technology that had caused states to proliferate the nuclear and mass destruction weapons for their security. Nevertheless, the proliferation in this nuclear age has caused states to wage a ritualistic style of wars, where demonstration of power has become increasingly important rather than the actual physical application of violence (Chin, 2019). The states, thus, demonstrate their military superiority through the efforts and outcomes of technological innovation in defence.

Impact of Technology on the Security of China

Like other countries of the world, China also seems threatened by the security challenges posed by the technological advancement followed by invention of new war fighting weapons. Taking the Gulf War as a test case, many countries started studying the impact of technological advancement in the defence field as a major factor for decisive victory and thought technology as major challenge to the security of the states who were over reliant on the conventional weapons for their defence. Responding the emerging challenges to its security interests of China also revised its policy of military modernization diverting its focus from conventional weapons to the technologically advanced war fighting weaponry. Thus, China also studied the events of Gulf war as major factor for reshaping their defence policies emphasizing technological advancement for military purposes. The astounding victory in the Gulf War has been studied by militaries across the world (Cheung, Mahnken & Ross, 2014). China considered the Gulf War as a wakeup call to modernize and reform the People's Liberation Army (PLA) by means of comprehensive digitization and networking for creating a new joint force capable of fighting "High-Technology Local Wars" and "Local

Wars under Modern Conditions” (Cliff, 2015: 20-21).

Chinese apprehensions are demonstrated in its latest White Paper about defense policy thus rationalizing its military modernization program. The white paper states that competition in international system is constant. The United States of America has adopted unilateral policies and adjusted their national security and defense strategies. The unilateral policies of the United States of Americas has incited and intensified competition among major countries. It increased its defense spending, pressed for extra capacity in nuclear, outer space, cyber and missile defense, hence, it challenged global strategic stability (SCIO, 2019). Resultantly, many states throughout the world are redesigning their security, military strategies and organizational structures. They are developing new types of combat forces to achieve the strategic commanding heights in strategic competition. The United States is engaged in technological and institutional innovation to achieve military superiority (Hacker, 1997; and Hacker & Vining, 2006). Russia is evolving its New Look military reform, in the meantime, the UK, France, Germany, Japan and India are rebalancing and improving the structure of their military forces.

In response to the emerging security challenges China has also made efforts to improve its military strength. According to the Arms Control Association China maintains 290 Nuclear Warheads (Davenport & Reif, 2019) and preserves a minimal force of Nuclear Armed ICBMs to make sure its capability to execute a second strike capability (Crowe, 2018). It claims that China has around 143 nuclear capable land based missiles capable of delivering approximately 163 Warheads. The Atomic Scientists' Bulletin of 2016 shows that about 50-75 of these land-based missiles are ICBMs, while the DOD's annual military power report on China in 2017 shows China's ICBM arsenal at around 75-100 ICBMs. Only 40-50 of China's ICBMs are capable of targeting the US. According to Arms Control Association ICBM stockpile of China comprises DF-4 (CSS-3):5,500+ km range,

DF-5A (CSS-4, Mod 2): 13,000+ km range, DF-5B (CSS-4, Mod 3): ~12,000 km range. Besides that, the DF-5B is a variant of the DF-5A upgraded to carry MIRVs, DF-5C. It has been observed that China had flight tested the DF-5C, fixed with 10 warhead which has proved to be a big achievement in Beijing's nuclear weapons development. The DF-5C is stated to be a two-stage, liquid-fuelled missile having a range of around 8,000 miles, DF-31 (CSS-10, Mod 1): 7,000+ km range, DF-31A (CSS-10 Mod 2): 11,000+ km range, DF-41: in development. Moreover, China is also in the process of replacing the older liquid-fuelled missiles such as the DF-4 and DF-5A with the solid-fuelled ICBMs (Davenport & Reif, 2019).

According to the Global Fire Power (GFP) China ranks 3rd in world in terms of military strength. The Global Fire Power reveals that China maintains 2,693,000 military personnel with 2,186,000 active, while 510,000 being reserved forces. It further reveals that total aircraft strength of China is 3187, which include 1222 Fighters, 1564 Attack, Transports 193 and Trainers 368. While the total Helicopter strength of China is 1004. Until December 2016, Beijing's fleet of nuclear-capable bombers comprised of about 20 Hong-6 (H-6) bombers based on Soviet designs, with a range of only 3,100+ km, further, it was announced in March 2017 that the 5th generation stealth fighter jet Chengdu J-20 had entered the service. In land strength, China maintains 13050 Combat Tanks, 40,000 Armoured Fighting Vehicles, 4000 self-propelled Artillery, 6246 Towed Artillery, 2050 and Rocket Projectors. According to the same source, in Naval Strength, China has total 714 Naval assets which include 1 Aircraft Carrier, 52 Frigates, 33 Destroyers, 42 Corvettes, 76 Submarines, 192 Patrol Vessels, and 33 Mine Warfare (GFP, 2019).

However, the military competition among the major powers has reached to an unprecedented level. Under the influence of the latest round of technical and industrial revolutions, the use of state-of -the-art innovations such as artificial intelligence (AI), quantum information, big data, cloud computing and the Internet of Things is

accelerating in the strategic sphere (Kania, 2019).

New and high-tech, IT-based military technologies are developing fast. There is a strong tendency among the states to develop long-range precision, intelligent, stealthy or unmanned weapons and equipment. War is transforming into an information-based war, and it seems that intelligent warfare is on the horizon. Moreover, the paper emphasizes that the threats of technology surprise and rising technological generation gap threaten China's military security. In order to meet national security requirements, greater resources need to be made to military modernization.

The military modernisation programme of China started under the compulsion of emerging security challenges, has compelled Beijing to increase its defence budget. According to Centre for Strategic and International Studies Over the past two decades, China's military spending has increased almost eight-fold, from \$31.2 billion in 1998 to \$239.2 billion in 2018. China is currently spending more on defence than Japan, the Philippines, South Korea, and Vietnam combined, and China's military budget is second only to the United States (CSIS, 2019). China's growing spending on defence is the culmination of more than two decades of efforts to modernize its forces in an effort to bring them at par with the competing powers i.e. USA. China will keep up a reasonable and appropriate increase in defence spending to satisfy its national security and military reforms (Weiss, 2019).

Conclusion

Security of the states remains prime objective of every state. In the modern world, the security of states remains vulnerable to the challenges posed by technological advancements. States are under compulsion to address the emerging security challenges, which are permanent in nature. In that context, the real solution for national security and international peace depend on intelligent and fair use

and sharing of technology. The state and non-state actors need to act wisely in order to foster cooperation and ensure peaceful co-existence.

Technology that has created many security challenges for the states in the modern era. On the one hand, technology has become blessing for the states because it has eased and facilitated the security of states. On the other hand, it has proved to be curse for those states, which are facing security challenges created by technological weapons. Sensitive and careful use of technology, removing communications barriers, bridging communication gaps etc. can help to minimize the security dilemma of the states. The states, no doubt, have been enhancing their defence and military capabilities for maintaining acceptable level of national security. However, Amitav Mallick in his book, *Technology and Security in the 21st Century: A Demand-side Perspective* (2004) suggests that the military diffusion will help states in promoting broader economic and social development. Mallick strongly advocates “the elimination of chemical and biological weapons and a step-by-step approach to a nuclear weapon-free world” (Mallick 2004, p.vii).

The existence of nuclear arsenals by many states now days has made modern war almost obsolete. The technological advancement in military capability has lessen the chances of physical fight that require economy, society and life-or-death struggle against other states; it has encouraged states to attack on enemy’s moral rather than its physical power. Growing defence spending of China is the result of efforts of more than two decades. The China has made these efforts in order to bring herself at par with the competing powers in general and USA in particular. These efforts and spending by China will continue at a reasonable and appropriate pace to satisfy and maintain its national security and military standing.

References

- Carranza, M.E. (2016). *India-Pakistan nuclear diplomacy: constructivism and the prospects for nuclear arms control and disarmament in South Asia*. Lanham, Maryland: Rowman & Littlefield Publishers.
- Cheung, T.M., Mahnken, T.G. & Ross, A.L. (2014). Frameworks for analyzing Chinese defense and military innovation. In: T.M. Cheung (Ed.) *Forging China's military might: A new framework for assessing innovation* (pp.15-46). Baltimore: Johns Hopkins University Press.
- Chin, W. (2019). Technology, war and the state: past, present and future, *International Affairs*, 95(4), 765-783.
- Cliff, R. (2015). *China's military power: Assessing current and future capabilities*. New York: Cambridge University Press.
- Crowe, S.D. (2018). Nuclear innovation and national security. (Doctoral Dissertation). San Angelo, Texas: Angelo State University
- CSIS. (2019). *What does China really spend on its military?* Washington D.C.: Centre for Strategic & International Studies.
- Davenport, K. & Reif, K. (2019). Nuclear weapons: who has what at a glance? Fact Sheets & Brief. Washington D.C.: Arms Control Association.
- Fritsch, S. (2016). Technological ambivalence and international relations. E-International Relations Articles. Retrieved from: <http://www.e-ir.info/2016/02/24/technological-ambivalence-and-international-relations/> (accessed 17 June 2019).
- Ganguly, S. & Hagerty, D.T. (2012). *Fearful symmetry: India-Pakistan crises in the shadow of nuclear weapons*. Seattle: University of Washington Press.

- Global Fire Power (GFP). (2019). China military strength. Global fire power. Retrieved from: https://www.globalfirepower.com/country-military-strength-detail.asp?country_id=china. (accessed 17 September 2019).
- Hacker, B.C. (1997). Military technology and world history: a reconnaissance, *The History Teacher*, 30(4), 461-487.
- Hacker, B. C. & Vining, M. (2006) *American military technology: The life story of a technology*. West Port, Connecticut and London: Greenwood Technographies.
- Kania, E.B. (2019). Innovations in the new era of Chinese military power: What to make of the new Chinese defense, *The Diplomat*, July 25.
- Kluz, A. & Firlej, M. (2015). The impact of technology on foreign affairs: Five Challenges. Foreign Policy Blogs. Retrieved from: <https://foreignpolicyblogs.com/2015/12/22/the-impact-of-technology-on-foreign-affairs-five-challenges/> (accessed 17 June 2019).
- Lewis, J.A. (2002). *Assessing the risks for cyber terrorism, cyber war and other cyber threats*. Washington DC: Centre for Strategic & International Studies.
- Mallik, A. (2004). Technology and security in the 21st Century: A demand-side perspective. Stockholm International Peace Research Institute (SIPRI) Research Report No. 20. Oxford University Press.
- Marshall, M. (2009). Timeline: Weapons technology. The Daily Newsletter. Retrieved from: <https://www.newscientist.com/article/dn17423-timeline-weapons-technology/> (accessed 15 June 2019).
- Mishali-Ram, M. (2019). Conflict change and persistence: The India-Pakistan and Arab-Israel conflicts compared. London:

Lexington Books.

Moore, G.J. (2014). North Korean Nuclear operationality: Regional security and nonproliferation. Baltimore: Johns Hopkins University Press.

O'Bryan, J. (2103). *A history of weapons: Crossbows, caltrops, catapults & lots of other things that can seriously mess you up*. San Francisco: Chronicle Books LLC.

Reohrig, T. (2016). North Korea, nuclear weapons, and the stability-instability paradox, *The Korean Journal of Defense Analysis*, 28(2), 181-198.

Rid, T. (2011). Cyber war will not take place. *Journal of Strategic Studies*, 35(1), 5-32.

Samuels, C. (2011). *Prehistory-A.D. 500: Ancient science*. New York: Gareth Stevens Publishing.

SIPRI. (2016). SIPRI Year Book 2016: Armaments, disarmaments and international security summary. Solna, Sweden: Stockholm International Peace Research Institute.

State Council Information Office (SCIO) of the People's Republic of China. (2019). China's national defense in the new era. Beijing: Foreign Languages Press Co. Ltd.

Tunis, E. (1999). *Weapons: A political history*. Baltimore and London: The Johns Hopkins University Press.

Weiss, J. C. (2019). How hawkish is the Chinese public? another look at "rising nationalism" and Chinese foreign policy, *Journal of Contemporary China*, 28, 679-695.