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DISRUPTIVE TECHNOLOGIES IN THE INDIAN ARMED FORCES

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INTRODUCTION

In simple terms, a disruptive technology is a sort of technical innovation that is newly introduced, hence, replacing or disrupting any existing technology. It is believed that revolution is a part of life and disruptive technologies act as a mode to carry it forward. For example, organised warfare, as it is understood today, is very different from what it had been during the stone age. People were seen to have been fighting for food, resources or survival. However, it is clear that it is not the case today and instead, people engage in wars to show dominance or to protect their country from terrorism. It is not only the involvement of men that experienced the change, but also the technology that was being used at that time, that experienced a complete changeover. The available evidence leads to infer that the technologies did impact warfighting in those particular periods of time. It is lucidly understood today that technology has been an intricate part of defence strategies for many decades and played the role of a protagonist in shaping military doctrines and more specifically, the rules of warfare systems. The outcomes of war are not only reliant on the weapons that are being used, but also on the peripheral technological developments that play a major role in deciding the outcomes of the war.[1]

The Innovators' Dilemma is a book that essentially explains the popularity of the phrase 'disruptive technologies'. Disruptive innovation and disruptive technologies must not be viewed through two separate lenses. They are intertwined in the sense that the disruptive technologies lie at the centre of the disruptive innovation. Hence, it is the disruptive technologies that lead to disruptive innovation. The change in technology over the period of time is evidenced by some examples like a change from digital cameras to film cameras, replacement of mobile phones from wire line technology and portable computers replacing desktops. etc.

When the discourse on the relation of defence and disruptive technologies is brought up, it can be well analysed that the dual use nature of technology and its interchangeable usage, in both commercial and military arenas, have sort of made the military technology susceptible to disruption. In the main realm of defence and security, it can be observed that the disruptive technology represents a technological development that significantly changes the rules or conduct of conflict within one or two generations. The military leadership in other words is bound to experience the change in the conduct of the operations with the change in technology.

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[1] Ahluwalia, V. K. 2019. "Imperatives of Transformation: Changing Character of Conflict in the Emerging World Order." *CLAWS Journal,* pp. 21-43.

Hence, the development in technology and the change in the military conducts of operations is directly related. For instance, the change in Information and Communications Technologies (ICTs) has increased its significance in the modern-day warfare. It has been noticed by the officials that the armed forces are aiming to improve agility in their strategic and tactical operations which has been enabled by the use of the ICTs to overcome geographical limitations.[2]

This paper essentially lays out its emphasis on the disruptive technologies within the context of the Indian Armed Forces. It highlights the importance of disruptive innovation in the Indian Military Matrix and provides future prognosis by offering relevant suggestions.

THE CONTEXT OF THE INDIAN ARMED FORCES

The government of India is trying to infuse innovation in the Indian industry which has perhaps resulted in the promotion of the domestic defence production through various policy reforms and other policy initiatives. The cycles that involved the late 1900s wars, mainly 1948 India-Pakistan War, 1962 Indo-China War, 1965 and 1971 Indo-Pak War, simply led to the opening up of the gaps in the Indian defence capabilities, ultimately leading the governments to put forth their attention towards enabling innovation in the particular industry. For example, the Make in India initiative has created a conductive and productive environment for the whole nation, in order for it to prosper. Since India has its own domestic private sector, it has generated the foreign attraction and yearning in search of technical innovations. It can be said that India is a breeding ground for technological innovations, mainly in the aerospace and defence market.[3]

As far as India is concerned, the scholars have witnessed that it has increased its focus on the development of disruptive technologies as it has acquired an even greater urgency. It is believed that this could be because of one simple but important reason – the change of China's foreign policy from peaceful rise to that of a more aggressive and expansionist stance. Looking at certain claims that China had made in the past few decades, for example the cases such as the South China Sea, Sikkim, Jammu & Kashmir and Doklam and many other become completely relevant in this particular issue. Till the time China was following its peaceful rise policy and had maintained certain bilateral and multilateral relations with other countries that resulted out to be mutually beneficial but have now been completely turned into something that demonstrates threat and one's dominance over the other. China is now trying to get to a position equalling that of the United States or even eventually surpassing United States as the dominant military power in the world.[4]

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[2] Lele, Ajey. 2019. "Defence and Disruptive Technologies. In: Disruptive Technologies for the Militaries and Security." In *Smart Innovation, Systems and Technologies*. Singapore: Springer.

[3] Banik, Arindam, Shuktij Singh Rao, Ashutosh Khanna, and Deepu Philip. 2019. "Disruptive Innovation in Indian Aerospace and Defence Industry." *Studies in Microeconomics,* pp. 1-16.

[4] Singh, Jasjit. 2007. "Air Power and India's Defence." *Knowledge World.*

It can be believed that India has not much achieved in terms of its technological military advancements as compared to that of the United States and China, nevertheless, the country is on the progressive road to accomplish its goals and targets. The inherent strength that India possesses has unfortunately, not yet been explored by the Indian Armed Forces, particularly the sectors of ICT and Artificial Intelligence (AI), as they are booth rooted in the field of computer science. It is believed that India could achieve way more than what it expects in terms of the development of the military technologies, but it must strengthen its AI-powered military systems. As far as the reports of the Defence Research and Development Organization (DRDO) are concerned, there is a lack of concept papers and other doctrinal literature that primarily lay emphasis on the importance of the AI-powered defence systems.

Since there were timely interventions being held, it was reported that the Indian Army Chief General M.M. Naravane, reportedly urged the armed forces "to pay adequate emphasis on the available disruptive technologies that have dual use and are being driven by commercial entities and innovations", hence, trying to merge them into the context of the Indian realm. As a result of this, the DRDO reappraised its laboratories and established panels in order to reduce their technological overlapping. It becomes immensely significant for the Indian Armed Forces to think beyond imagination and out of the box, considering that China and Pakistan have coupled their axis in stronger terms in the past few decades and the intentional leakage of disruptive technology by Pakistan to its non-state proxies. An instance where non-state actors exploiting freely available technologies is exemplified by the Ukrainian bombing by the Ukrainian separatists, who were reported to have used the thermite grenades delivered by drones. This particular move had caused great devastation for a span of around 2 years (2015 and 2017).[5]

It was also addressed by the Prime Minister of India, Sh. Narendra Modi, that India needs to make its defence sector self-reliant through policy reforms such as banning the import of the 101 weapon systems as well as permitting 74% of Foreign Direct Investment in defence manufacturing. This has not only sent out a positive signal for the all the personnel working as the military personnel, but also to the world, helping them realise what a self-reliant India means. With such advancements, India is eventually becoming assured of its military preparedness to face any non-conventional threats.

CONCLUSION AND FUTURE PROGNOSIS

Given the intense competition around the globe between the nations, analysts have warned that the disruptive technologies must not be considered as a magic spell in the preparations of the military conductions. Though it enhances the military capabilities to large extents and provides the military personnel with several leaps in technological advancements, it must be assured that

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[5] Pant, Harsh V., and Anant Singh Mann. 2020. *Disruptive technologies in the Indian military matrix.* August 31. Accessed July 1, 2021. https://www.orfonline.org/expert-speak/disruptive-technologies-in-the-indian-military-matrix-72494/.

there is no misuse of this sort of technology as it could simply lead to an unwanted war or any confrontation as such.[6]

When discussing about the topics of the disruptive technology and disruptive innovation, another streamlined topic cannot be ignored. Artificial Intelligence (AI) is perhaps, the most known and developing area, with extensive capabilities of disruption. Artificial Intelligence has the power to resist hacking communications and can definitely be an asset to the Indian Armed Forces, also providing them a platform for unmatched computational battlefield. Keeping in view the entire journey with the programming of Artificial Intelligence, it appears that the DRDO is still left behind, stuck in the trap of the traditional use of technology, even when it continues to face under-budgeting and also lack of time management as well. The only route that stands for India to grow in this particular field and make use of its full potential of disruptive technologies, is the government's careful nurturing of the sustainable domestic ecosystem.

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[6] Keefe, John C. 2007. "Disruptive Technologies for Weapon Systems: Achieving the Asymmetric Edge on the Battlefield II." *The WSTIAC Quarterly,* pp. 1-5.