

MILITARY MODERNIZATION UNDER ARTIFICIAL INTELLIGENCE  
BY CHINA AND INDIA: IMPLICATIONS FOR PAKISTAN



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*This thesis is dedicated to my mother.*

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## ABSTRACT

The surge in global military modernization, fuelled by advancements in artificial intelligence technology, has reshaped the strategic landscape, particularly in regions where superpowers like China and India exert significant influence. This research examines the consequences of China and India's AI-driven military modernization efforts on Pakistan. China's extensive integration of artificial intelligence into its military poses a substantial threat to regional stability, altering the strategic dynamics of Asia. In response, India has intensified its own efforts to incorporate artificial intelligence into its armed forces, aiming to maintain regional dominance and bolster defence capabilities. Employing a mixed methodology comprising structured interviews and content analysis of primary source data, this study investigates the incorporation of AI into military strategies, shedding light on the current military modernization initiatives of China and India and their implications for Pakistan. The research identifies a spectrum of challenges and opportunities for Pakistan arising from the AI-driven military modernization efforts of its neighbours. While the widening technological disparity raises concerns for Pakistan's defence capabilities, potential avenues for collaboration in utilizing AI technologies for defence, particularly with China, also emerge. The findings underscore the imperative for Pakistan to adopt proactive measures to safeguard its national security interests amidst evolving regional dynamics.

**Keywords:** Artificial Intelligence, Military, Pakistan

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## **LIST OF ABBREVIATIONS**

AI - Artificial Intelligence

AIRC- Artificial Intelligence Research Centre

AUV- Autonomous Underwater Vehicle

BRI- Belt and Road Initiative

CAIR- Centre for AI and Robotics

DAIC- Defence AI Council

HAL- Hindustan Aeronautics Limited

IT- Information Technology

ISRO- Indian Space Research Organisation

IAI- Israel Aerospace Industries

LAWS- Lethal Autonomous Weapon Systems

LWD- Land Warfare Doctrine

LoC- Line of Control

MARF- Multi Agent Robotic Framework

NCAI- National Centre for AI

NDAA- National Defense Authorization Act

NIAIS- National Initiative for Artificial Intelligence and Security

NFU- No First Use

PLA- People's Liberation Army

PGM- Precision Guided Munitions

PIAIC- Presidential Initiative for Artificial Intelligence and Computing

ROV- Remotely Operated Vehicle

SLBMS- Submarine-Launched Ballistic Missile

SAGE- Semi-Automatic Ground Environment

UAVs- Unmanned Aerial Vehicles

USRC- Unmanned Systems Research Centre

## CHAPTER 01: INTRODUCTION

### 1.1 Background

Artificial intelligence (AI) has come a long way since it was first developed more than 60 years ago. At first, artificial intelligence was mostly based on mathematical modelling and rule-based automation, and it was used to solve a limited number of problems, such as winning at chess etc. The practical uses of AI have become pertinent to many other fields as machine learning has advanced, especially with the advent of deep learning and the ability to process enormous amounts of data (also known as "big data"). AI is now capable of simulating or facilitating, if not completely replacing, human interaction. Advanced AI algorithms are already capable of carrying out tasks in several sectors considerably faster, more reliably, and inexpensively than human being.<sup>1</sup>

Today's world has entered what is known as the Fourth Industrial Revolution, and many experts contend that rather than being viewed as a specialised weapon, AI should be understood as a general-purpose innovation and an enabler with wide range of applications.<sup>2</sup> In other words, AI might allow a variety of military innovations, but it is not a military innovation in and of itself. Technology analyst Kevin Kelly linked artificial intelligence to electricity, saying that just as electricity gives objects around us power, so too will AI give them intelligence.<sup>3</sup>

AI is defined as follows in the FY2019 NDAA:

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<sup>1</sup> Daniel Oriesek, "The Potential Impact of Artificial Intelligence on Preventive Diplomacy from a Balance-of-Threat Perspective." Dash.harvard.edu, (February, 2022) <https://dash.harvard.edu/handle/1/37370754>.

<sup>2</sup> Gloria Özdemir, "Artificial Intelligence Application in The Military the Case Of United States And China Analysis." (2019) [https://setav.org/en/assets/uploads/2019/06/51\\_AI\\_Military.pdf](https://setav.org/en/assets/uploads/2019/06/51_AI_Military.pdf).

<sup>3</sup> Michael C. Horowitz, "Artificial Intelligence, International Competition, and the Balance of Power" *Texas National Security Review* (May 15, 2018) <https://tnsr.org/2018/05/artificial-intelligence-international-competition-and-the-balance-of-power/>.

1. Any artificial system that can operate in a variety of unpredictable and changing conditions with little to no human supervision, or that can gain experience and become more efficient when given access to large amounts of data. 2. An artificial system that is created in the form of computer software, hardware, or another context that is used to accomplish tasks that call for human-like perception, thought, communication, learning or planning. 3. A manmade system, such as a neural network or cognitive architecture, created to behave or think like a human. 4. A collection of techniques intended to imitate a cognitive task, such as machine learning. 5. An artificial system with the intent to behave rationally, such as an intelligent software agent or an embodied robot that plans, thinks, plans, learns, communicates, and makes decisions to accomplish objectives.<sup>4</sup>

AI regarded as 4th Industrial Revolution, is a reality in the modern world, particularly in military. Professionals and academics have long emphasised the significance of AI. Additionally, international leaders like Trump, Xi, Putin and Obama have all made significant remarks that highlight the importance of AI. Putin's statement from September 2017 may be summed up as follows: whoever turn out to be the leader in AI, will govern the world.<sup>5</sup>

Since AI has developed so quickly in recent few years, it has a wide variety of military and civil uses. It is widely accepted that military is motivated by desire for modification as it relentlessly pursues better, quicker, and more powerful weapons or technology, and AI precisely offers these things. Svenmarck has rightly noted that AI in the military can

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<sup>4</sup> "National Defense Authorization Act." NSCAI. 2019. <https://www.nscai.gov/about/authorization-act/#:~:text=%E2%80%94In%20this%20section%2C%20the%20term>.

<sup>5</sup> "Whoever Leads in AI Will Rule the World': Putin to Russian Children on Knowledge Day." RT International. RT. (September 2017). <https://www.rt.com/news/401731-ai-rule-world-putin/>

affect all domains (i.e., land, sea, air, space, and information) and all levels of war (i.e., political, strategic, operational, and tactical)."<sup>6</sup>

Many government officials, technologists, and academics have hailed AI as a revolution; yet their views on the subject vary. Some people specifically view AI as an optimistic development because it would lessen human losses by substituting human forces with machines that could be used in any mission, even the most dangerous ones, while also offering strategic and tactical advantages. Others raise the alarm that, if not controlled and employed appropriately, AI could initiate new worldwide conflicts.<sup>7</sup>

More than 20 nations have revealed their official AI strategies in response to the potential of AI, and more states and non-state organisations are moving decisively forward with AI research and development (R&D). However, China and the United States are seen as two most important players in field of AI, with China intending to overtake the United States and take lead in AI by 2030 and the U.S. aiming to maintain its hegemony in the battlefield. Both states have developed independent national plans that adhere to their goals, but more crucially, both benchmark each other's strategy. Today, it is believed that AI will benefit the states that employ it, not just in the civilian sphere but also and most significantly in the military domain. It is also anticipated that it will change the way how power is now distributed. The consequences, however, would be negative for the nations that choose not to use this technology in their armed forces.<sup>8</sup>

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<sup>6</sup> Peter Svensmark, "Possibilities and Challenges for Artificial Intelligence in Military Applications." ResearchGate (2018)

[https://www.researchgate.net/publication/326774966\\_Possibilities\\_and\\_Challenges\\_for\\_Artificial\\_Intelligence\\_in\\_Military\\_Applications](https://www.researchgate.net/publication/326774966_Possibilities_and_Challenges_for_Artificial_Intelligence_in_Military_Applications).

<sup>7</sup> Kenneth Payne, "Artificial Intelligence: A Revolution in Strategic Affairs?" *Survival* 60, no. 5 (2018): 7–32. <https://doi.org/10.1080/00396338.2018.1518374>.

<sup>8</sup> Paul Scharre, "Killer Apps." (February 18, 2020) <https://www.foreignaffairs.com/articles/2019-04-16/killer-apps>.

The Cold War, a time of strong geopolitical rivalry among the US and the USSR, is where artificial intelligence (AI) for military applications first emerged. The military looked for novel approaches to obtain a strategic advantage during this time. The creation of the Semi-Automatic Ground Environment (SAGE) system in the 1950s was one noteworthy achievement. Early AI was used by the large computer network SAGE to facilitate real-time air defence system monitoring and coordination. Even though SAGE was primitive by today's standards, it set the stage for later military AI uses. With the Gulf War acting as a trigger, military technology underwent a substantial transition in the 1990s. The potential of artificial intelligence (AI) to improve the precision and efficacy of military operations was proved by the employment of precision-guided munitions (PGMs). AI algorithms were used to direct bombs and missiles with previously unattainable precision, reducing collateral damage and boosting the effectiveness of military operations.<sup>9</sup>

Autonomous systems and unmanned aerial vehicles (UAVs) proliferated in the twenty-first century, which was another significant development in the use of AI in military operations. Drones, or unmanned aerial vehicles, or UAVs, use AI to perform tasks including target recognition, navigation, and surveillance. Remote UAV operations increase the range and impact of military surveillance and strike capabilities while lowering the risk to human pilots.<sup>10</sup>

Military intelligence gained a new dimension with the introduction of machine learning. Large datasets gave artificial intelligence (AI) systems the capacity to learn and adapt, enhancing their capacity to comprehend complex situations, forecast the actions of

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<sup>9</sup> Warren Chin, "Technology, War and the State: Past, Present and Future." *International Affairs* 95 (4): 2019 765–83. <https://doi.org/10.1093/ia/iiz106>.

<sup>10</sup> Adib Rashid, "Artificial Intelligence in the Military: An Overview of the Capabilities, Applications, and Challenges." *International Journal of Intelligent Systems* (2023): 1–31. <https://doi.org/10.1155/2023/8676366>.

adversaries, and spot patterns in massive amounts of data. To collect and evaluate intelligence data and help military decision-makers formulate plans of action, machine learning algorithms become essential.<sup>11</sup>

Application of AI in military settings gives countries upper hand on battlegrounds because machines are more precise and quicker than humans on battlefield, in logistics, and decision-making. This is main the driver behind the power of AI to change existing balance of power. Military can also carry out high-risk missions for extended periods of time with AI's assistance, something that can't be done by men.<sup>12</sup>

Understanding the ramifications of China and India's military modernization initiatives under AI is of utmost relevance for Pakistan, which is located in a region defined by historical tensions and conflicts. Pakistan, a nuclear-armed nation with security issues, must carefully assess the changing military circumstances in its neighbourhood and take appropriate action.

## **1.2 Research gap/Rationale**

While there exist numerous studies on China and India's military modernization initiatives, there is a knowledge gap on particular implications for AI-driven military modernization for Pakistan. The existing research frequently concentrates on China's and India's distinct military modernization initiatives without sufficiently examining the consequences for Pakistan's overall national security and defence policy. Therefore, the necessity to give a thorough study of implications of China and India's military modernisation under AI, notably for Pakistan, constitutes the research gap for this work.

This research fills this gap by analysing Pakistan's opportunities and difficulties in

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<sup>11</sup> Michael Lee, "Current and Future Applications of Machine Learning for the US Army" (2018) <https://apps.dtic.mil/sti/pdfs/AD1050263.pdf>.

<sup>12</sup> Andrew Hunter, "Assessing the Third Offset Strategy." *Csis.org*. (2017). <https://www.csis.org/analysis/assessing-third-offset-strategy>

response to neighbouring nation's AI-driven military achievements and by considering possible tactics Pakistan may use to strengthen its defence capabilities in this changing environment.

### **1.2.1 Contextual Gap**

This kind of gap concerns the lack of study that has been done specifically in the context of Pakistan in relation to China and India. Studies that look at Pakistan's military might, defence plans, and technical readiness in response to its neighbours' AI-driven modernization initiatives are lacking in the literature. It is easier to recognise potential difficulties, risks, and possibilities connected with AI-driven military breakthroughs in the region by having a thorough understanding of Pakistan's particular context, including its regional dynamics, previous conflicts, and military doctrine.

### **1.2.2 Methodological Gap**

There is a methodological gap in the approaches used to collect data and analyse it specifically for the study of Pakistan's implications for AI-based military modernization. For instance, precise information about the degree of AI integration in China's and India's military capabilities and its possible effects on Pakistan is not available. By using cutting-edge data collection techniques, such as expert interviews researcher has filled this gap.

### **1.3 Problem Statement**

New era of military modernisation has begun as an outcome of the rapid integration of AI by countries. With a focus on integrating AI into military systems and operations, China and India in particular have emerged as major participants in this field. Given the complicated regional dynamics and long-standing rivalry, AI-driven modernization of the military by China and India is of utmost relevance for Pakistan. The capabilities and



intents of China and India, the potential repercussions of utilising AI in military operations, and the ensuing influence on Pakistan's national security and defence strategies are just a few of the many variables that have been thoroughly analysed in order to fully comprehend the ramifications.

#### **1.4 Research Questions**

Following are research questions for this study:

RQ1: How are China and India competing for the use of AI in their military build-up?

RQ2: Why AI-driven military upgrading by China and India is affecting Pakistan's security?

RQ3: How can Pakistan address those effects by charting out a comprehensive approach?

#### **1.5 Hypothesis**

*H<sub>1</sub>*: AI-driven military modernization by China and India may have security implications for Pakistan.

#### **1.6 Objectives**

This study's goal is to analyse China's and India's military modernization initiatives in context of AI technology and consider what it means for Pakistan. The study specifically seeks:

- To analyse security implications for Pakistan due to China and India's AI-driven military upgrading.

### **1.7 Significance of study**

This research identifies Pakistan's unique problems and potential by analysing China and India's achievements in AI-enabled military technology, such as cyber warfare, autonomous systems, and data-driven decision-making. The potential changes in balance of power, risks associated with integrating AI, and the strategic steps Pakistan must take to maintain its stability and security in the face of shifting regional dynamics are all covered. Additionally, this study also sheds light on the technological advancements and policy adjustments Pakistan must undertake in order to successfully adapt to the evolving field of AI-enabled modernization of the military.

The results of this study not only advance scholarly knowledge of the effects of military modernization under AI but also offer practical advice to defence planners, Pakistani legislators and military authorities. Pakistan can efficiently develop its defence policies, allocate resources, and improve its capabilities to sustain regional stability and protect its national interests by better understanding the possible risks and opportunities linked to AI-driven military developments in neighbouring nations.

## CHAPTER 02 LITERATURE REVIEW/ THEORETICAL FRAMEWORK

### 2.1 Literature Review

This study investigates the effects that China's and India's military development using artificial intelligence (AI) has on Pakistan. The importance of developing technologies may seem minimal or at least premature when cross-border terrorism, nuclear and conventional forces, and other security threats dominate the region. Contrary to popular belief, information technology (IT), which includes artificial intelligence (AI), has long influenced how South Asian nations perceive security and stability. India expressed its worries about the fusion of new technologies and nuclear weapons at the Conference on Disarmament in Geneva more than 30 years ago.<sup>13</sup>

#### 2.1.1 India and China's competition in the use of AI for military modernization

China has asserted its sovereignty over parts of a number of states in South China Sea, including Indonesia, Philippines, Vietnam, Taiwan and Malaysia. Nobody can deny the fact that how important South China Sea is to China. China fears that tensions may rise as a result of the US and its allies' increasing involvement in the disputed waters; as a result, AI can help China keep control of the South China Sea. For instance, submarines and maritime drones may play vital roles in performing monitoring tasks.<sup>14</sup> This will strengthen the deterrent and drive the other parties to rethink their plans, which will prevent United States and its allies from needlessly mobilising in South China Sea. The Chinese military is building a base in the deep sea that will be able to conduct operations against rival ships, aircraft carriers, etc., as well as be used to track and study activities of international ships. This will be crucial in locating US submarines in the

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<sup>13</sup> "Conference On Disarmament to Hold First Part Of 1996 Session at Geneva, 22 January - 29 March | UN Press." n.d. Press.un.org. <https://press.un.org/en/1996/19960124.dcf247.html>.

<sup>14</sup> Jonathan Hall, "Artificial Intelligence in the South China Sea." *Global Risk Insights*. (December 28, 2018) [https://globalriskinsights.com/2018/12/artificial-intelligence-turning-tide-asia-pacific/#google\\_vignette](https://globalriskinsights.com/2018/12/artificial-intelligence-turning-tide-asia-pacific/#google_vignette).

area and eroding the US's current comparative naval advantage as a result. China has also planned to have nuclear arsenal in deep-sea base in addition to its surveillance operations, greatly enhancing its nuclear deterrent capability.<sup>15</sup>

China sees advancements in AI as the foundation of its leadership in new technologies. The central national policy known as "Made in China 2025," which was released in 2015, makes clear the importance that China has assigned to AI. New Generation Artificial Intelligence Development Plan (2017) is a further significant document.<sup>16</sup> China's National Defence in New Era,<sup>17</sup> an official white paper released in 2019, is advocating a similar policy. However, the Central Military Commission of China has not yet announced an official AI plan.<sup>18</sup> China is also spending money on AI decision-making applications. It contends that "leapfrog development" in military AI is only way to achieve mechanised combat, which is at the centre of future conflict. National Innovation Institute of Defence Technology (NIIDT) established Artificial Intelligence Research Centre (AIRC) and Unmanned Systems Research Centre (USRC) in 2018 in order to accomplish this goal.<sup>19</sup>

The GJ-1, GJ-2, WZ-7, EA-03, and Soaring Dragon are a few examples of China's advanced unmanned combat aerial vehicles with medium to high altitude endurance that have recently been released.<sup>20</sup> The autonomous underwater vehicle (AUV) Sea Whale

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<sup>15</sup> Liu Zhen, "Time for Tougher Deterrence from China' to Counter US in South China Sea." South China Morning Post. (March 29, 2019) <https://www.scmp.com/news/china/diplomacy/article/3003895/time-tougher-deterrence-china-us-steps-patrols-south-china-sea>.

<sup>16</sup> The People's Republic of China, The State Council Information Office. "Next Generation Artificial Intelligence Development Plan." (2017) <http://fi.china-embassy.gov.cn/eng/kxjs/201710/P020210628714286134479.pdf>.

<sup>17</sup> Anthony H. Cordesman, "China's New 2019 Defense White Paper." *Csis.org* (2019) <https://www.csis.org/analysis/chinas-new-2019-defense-white-paper>.

<sup>18</sup> Elsa Kania, "AI Weapons' in China's Military Innovation." *Brookings* (2020)

<sup>19</sup> Gregory Allen, "Understanding China's AI Strategy." CNAS. 2019. <https://www.cnas.org/publications/reports/understanding-chinas-ai-strategy>.

<sup>20</sup> Rick Joe, "China's Growing High-End Military Drone Force." *The Diplomat.com* (2019). <https://thediplomat.com/2019/11/chinas-growing-high-end-military-drone-force/>.

2000 has also undergone successful development and testing, according to the Chinese Academy of Sciences. It can function for about 40 days at a depth of 2,000 metres below the surface of the ocean. This drone, which resembles a torpedo, can complete lengthy "endurance missions." It has AI-enabled sensors that can track chemicals and biological activities as well as detect temperature. China already possesses a "large-displacement autonomous underwater vehicle (LDAUV)" that can deliver small payloads and gather information about the placement of ships and submarines.<sup>21</sup> China intends to progressively update its intelligently equipped armed forces using 6G technologies. China placed the world's first 6-G satellite into orbit in November 2020 and 5G technology in November 2019.<sup>22</sup> The People's Liberation Army (PLA) will revolutionise military uses of AI such combat formations, command and control, image processing, enhanced ISR, and logistic support with the deployment of 6G technology. In 2030, the general population will have access to this technology.<sup>23</sup>

China has made considerable strides in AI and is outpacing other nations. For instance, China is spending a lot of money on unmanned aerial vehicles and autonomous drones like AK-47-capable Blowfish 2.<sup>24</sup> Additionally, China started working on autonomous submarines in 2018. These submarines will be far better at recognising targets than the present ones, won't need refuelling for years, and may easily operate without being

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<sup>21</sup> Ankit Panda, "A New Chinese Autonomous Underwater Vehicle?" TheDiplomat.com. 2019.

<https://thediplomat.com/2019/11/a-new-chinese-autonomous-underwater-vehicle/>

<sup>22</sup> "China Sends 'World's First 6G' Test Satellite into Orbit." BBC News. November 7, 2020.

<https://www.bbc.com/news/av/world-asia-china-54852131>

<sup>23</sup> Kristin Huang, "China's Military Draws on 6G Dream to Modernise Its Fighting Forces." South China Morning Post. April 18, 2020. <https://www.scmp.com/news/china/military/article/3080235/chinas-military-draws-6g-dream-modernise-fighting-forces-and>.

<sup>24</sup> Jenny Awford, "China Unleashes Killer Bots and Drones That Carry out Airstrikes on Their Own." The Sun. (February 10, 2019) <https://www.thesun.co.uk/news/8394455/china-killer-robots-drones-airstrikes-autonomous/>.

noticed.<sup>25</sup> In order to have an impact on regional tech services, China is constructing one of biggest and tallest cloud computing data centres in world in the high-tech autonomous province of Tibet. Through this facility, China hopes to offer services in areas of video rendering, autonomous driving, data backup, and remote data learning. With 447 data centres currently, China is the fourth nation in the world with the most data centres. Since the dawn of the twenty-first century, cyberwarfare which can be thought of as fifth dimension of conflict between two regional powers China and India has grown in sophistication.<sup>26</sup>

AI-oriented defensive strategy for algorithmic warfare cannot be ignored in this environment, as hegemonic attitude of two powerful adversaries (India and China) in region is resonating in every realm of security. India and China are constructing their AI strongholds while disguising them as data centres. China has an extraordinary thirst for the technology according to its strategic objective to overtake the rest of world in AI by 2030. With an estimated \$150 billion in investments, China is building a strong AI sector to beat its opponent.<sup>27</sup>

India and China see each other as important regional players. China has made significant investments in AI. India is currently using artificial intelligence to improve its reputation as a great power. In particular, armed forces are of opinion that if India does not begin using AI in near future, there will be vast gap between it and its opponents in region that would be difficult to close and would prevent India from achieving leading position in international affairs. In addition, despite China's rise, there

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<sup>25</sup> Marc Prosser, "China Is Building a Fleet of Autonomous AI-Powered Submarines. Here Are the Details." Singularity Hub (August 15, 2018) <https://singularityhub.com/2018/08/15/china-is-building-a-fleet-of-autonomous-ai-powered-submarines-here-are-the-details/>.

<sup>26</sup> Ahmad Khan and Adeela Azam, "Role of Artificial Intelligence in Defence Strategy: Implications for Global and National Security." *ISSI* (2021)

<sup>27</sup> Ben Murphy, "How the Chinese Military Is Adopting Artificial Intelligence." *Center for Security and Emerging Technology*. (2021) <https://cset.georgetown.edu/publication/harnessed-lightning/>

won't be "Unipolar Moment"; instead, multipolar world will develop, and India desires to be a part of it. Therefore, it has tended towards militarising artificial intelligence in order to present itself as one of the most powerful nations in the world.<sup>28</sup>

In 2019, then Indian Army Chief Bipin Rawat emphasised need for armed services to use AI to respond to threats across a variety of domains. As noted by Bipin Rawat, "since our adversaries are revolutionising the scope of their defence capacities, it is better that we catch up with them before it is too late."<sup>29</sup> To restructure the Indian armed forces, initiatives have been taken in light of this idea. India has increased efforts to revolutionise its military and use cutting-edge technologies against its enemies in light of much-hyped idea of two-front conflict with Pakistan and China. Exacerbating the already existing competition for regional influence, India and China both rivals assert to have made significant strides in information technology (IT) infrastructure and cutting-edge technologies like AI, big data, cloud computing, and internet of things (IoT).<sup>30</sup>

India is making significant investments in AI development and defence systems, pushing itself aggressively in the battle for artificial intelligence. India published its National AI Strategy in 2018, with the goal of achieving technological hegemony on a global scale. It appears that China and India both nations have strong interest in AI breakthroughs. In light of this, it is reasonable to assume that these formidable technological infrastructures could pose a threat to the region because they could act as hubs for AI research and development that ingest highly sensitive information about the

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<sup>28</sup> Dominic Barton and Jonathan Woetzel, "Artificial Intelligence: Implications for China." (2017) <http://dln.jaipuria.ac.in:8080/jspui/bitstream/123456789/1888/1/MGI-Artificial-intelligence-implications-for-China.pdf>.

<sup>29</sup> Harshajit Sarmah, "Army Chief Bipin Rawat Says India Should Focus on AI and Big Data Computing." *Analytics India Magazine* (January 21, 2019) <https://analyticsindiamag.com/army-chief-bipin-rawat-india-focus-ai-big-data-computing/>.

<sup>30</sup> Abeer Iftikhar, "India's Strategic Force Modernization and Its Implications on Strategic Environment of Pakistan." *Strategic Thought* 4, no. 1. (2022): 155–71. <https://strategictthought.ndu.edu.pk/site/article/view/83>.

region in order to perform statistical and predictive analyses of regional dynamics and produce AI-oriented technologies. The risks that these AI centres may present must be taken into consideration by regional actors or stakeholders, notably Pakistan given its standing as a nuclear state.<sup>31</sup>

There is no denying that India is a larger country in the South Asia with a sizable market potential. India is a developing market for investment in AI-related technologies, with approximately \$3.24 billion investment in 2022 in the field.<sup>32</sup> India has previously established a Centre for AI and Robotics (CAIR) within Defence Research and Development Organisation (DRDO) to gain a military edge in AI. CAIR is required to implement AI in the defence industry. CAIR aims to improve the decision-making, informational visualization, tracking, and object detecting capabilities of AI-based military systems. Additionally, AI and its use into military systems have received substantial attention in India's 2018 Land Warfare doctrine.<sup>33</sup>

The Indian Land Warfare Doctrine, released in December 2018, emphasises the use of AI in the armed services heavily. However, India has increased its efforts to modernise its military as a result of the changing circumstances in the region. China, India's close neighbour, has made incredible strides in AI. India, which sees China as threat because of its past interactions and China-Pakistan connection, is actively using AI in the

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<sup>31</sup> Adrienne Thompson, "Two Decades of AI: Where Does India Stand Today?" *Center for Security and Emerging Technology*. (March 17, 2022) <https://cset.georgetown.edu/article/two-decades-of-ai-where-does-india-stand-today/#:~:text=India%20was%20ranked%208th%20in>

<sup>32</sup> "India: AI Investment 2022." Statista. 2022 <https://www.statista.com/statistics/1395923/india-ai-investment/>

<sup>33</sup> Sanur Sharma, "AI and National Security: Major Power Perspectives and Challenges." 2022. <https://idsa.in/system/files/issuebrief/ib-AI-and-National-Security-ssharma-120922.pdf>.



military to strengthen its position. China is leading other countries in artificial intelligence thanks to a huge advancement.<sup>34</sup>

In 2018, the Indian government declared that efforts to combine AI with defence capabilities were already under way and will soon result in powerful autonomous weaponry. The Multi Agent Robotic Framework (MARF), which would support the Indian Army by acting as a team of soldiers, is currently under development.<sup>35</sup> Unmanned aerial vehicle Rustom II was hailed as a triumph in February 2018. This drone has a range of 250 km, which it may use for surveillance. 200 DAKSH Robots are also in the possession of the Indian military. These robots are autonomous and have the ability to traverse challenging terrain while disarming bombs in hazardous areas. These fall under the Remotely Operated Vehicle (ROV) category. In 2017, Chennai Labs successfully launched Muntra, the first unmanned tank. Muntra comes in a variety of forms, such as Muntra S, Muntra N, and Muntra M, which are used for surveillance, operation in regions with a high nuclear risk, and mine detection, respectively. Therefore, the race to modernise the military is gaining momentum quickly, and efforts will intensify in the near future.<sup>36</sup>

Indian government established High-Level Defence AI Council (DAIC) in February 2019.<sup>37</sup> Main purpose of DAIC is to deal with significant issues pertaining to strategic military-industry collaborations, data sharing, purchase of pertinent technology,

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<sup>34</sup> Surangya Kaur, "AI Race: China and US in the Lead, Where Does India Stand?" NewsClick. (February 12, 2018) <https://www.newsclick.in/ai-race-china-and-us-lead-where-does-india-stand>.

<sup>35</sup> Manohar Mahipal, "Artificial Intelligence in Defense Sector." International Research Journal of Engineering and Technology 05 (06): 2018. <https://www.irjet.net/archives/V5/i6/IRJET-V5I6501.pdf>

<sup>36</sup> "MUNTRA - S | Defence Research and Development Organisation - DRDO, Ministry of Defence, Government of India." n.d. [www.drdo.gov.in](http://www.drdo.gov.in).

<sup>37</sup> "Government of India, Ministry of Defence, Implementation of the Recommendations of the Multi-Stakeholder Task Force Constituted by the Ministry of Defence for 'Strategic Implementation of Artificial Intelligence for National Security and Defence,' Department of Defence Production. File No. 8(19)/2018-D (Coord/DDP), New Delhi, (February 2019) <https://ddpmod.gov.in/sites/default/files/AI.pdf>.

production of research papers, and acquisition of patents. Moreover, it is in charge of strengthening abilities of Indian military and assisting military training facilities develop AI-based training programmes. In order to assist the integration of AI into the Indian armed forces defence strategy and speed up transition from experimental stage to operationalization of AI projects, the DAIC was established. Within the next five years, the Indian military is considering using AI for mechanised combat, particularly for South Western Command, which is focused on Pakistan, in the Rajasthan desert.<sup>38</sup>

Projects like "Net-Centric Operations (AINCO)" and "Himshakti" for development of knowledge base and integrated electronic warfare system have also been finished by DRDO and CAIR. Additionally, CAIR has created a cutting-edge robot to detect damage to combat aircraft like the HAL Tejas, which can help the Indian Air Force maintain an efficient testing and maintenance system.<sup>39</sup> In addition to supporting local manufacturing, the Indian government is working with foreign nations to transfer AI and lethal autonomous weapon systems (LAWS). Israel Aerospace Industries (IAI) and Dynamic Technologies Limited (DTL) and Hindustan Aeronautics Limited (HAL) signed a memorandum of understanding (MOU) in February 2020.<sup>40</sup> This strategic partnership's major goal is to transfer technologies to support local production and provide India with about 100 Heron TPUAVs. The largest defence business in Israel is IAI, which also serves as the primary UAV provider to Indian armed forces.

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<sup>38</sup> DINAKAR PERI, "Army to Deliberate on Using AI for Mechanised Forces." *The Hindu* (September 20, 2019)

<sup>39</sup> KRITIKA ROY, "Rationales for Introducing Artificial Intelligence into India's Military Modernization Programme." 2020.

<sup>40</sup> Dmitry Stefanovich, "Artificial Intelligence Advances in Russian Strategic Weapons." *JSTOR* 03: 25–29. 2020.

Additionally, IAI will help India integrate air-to-ground missiles with updated Heron TPUAVs. The Indian government approved this \$400 million project in July 2018.<sup>41</sup>

In India, a special task force is being established to investigate various paths to develop into leading AI nation. Associates of this mission group include national cyber security coordinator, Indian Space Research Organisation (ISRO), Atomic Energy Commission and the Defence Research and Development Organisation (DRDO). Task group consists of members from important academic and research institutes in addition to significant defence organisations. Chairman of Indian commercial powerhouse Tata Sons is in charge of this task committee. The primary offensive and defensive practices of AI in areas of cyber, biological and nuclear warfare have been emphasised by this task group. It is also exploring revolutionary possibilities of AI in fields of air, land, and water.<sup>42</sup>

India's space programme has advanced incredibly well. India, on the other hand, believes that since China is able to destroy its satellites so India should develop reliable defence systems that are coordinated with AI in order to prevent any aggressive efforts by China. Without taking into account the repercussions, India is starting unneeded and expensive armaments race in region. Security of whole South Asian region is only at risk as a result of its fast military development, which is occurring in the absence of any direct threat from China. The advancements made by China are not meant to be utilised against India. However, India has a history of making unrelenting attempts to change

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<sup>41</sup> Manu Pubby, "Government Approves \$400-Million Plan to Procure Armed Heron TP Drones from Israel." The Economic Times, July 14, 2018.

<sup>42</sup> Rajat Pandit, "India Now Wants Artificial Intelligence-Based Weapon Systems." The Times of India (May 21, 2018) <https://timesofindia.indiatimes.com/india/india-moves-to-develop-ai-based-military-systems/articleshow/64250232.cms>

the status quo without taking the long-term effects into account in its goal for regional hegemony.<sup>43</sup>

The development of India's indigenous technology contributes to the favourable climate for militarization of AI. India has solid foundation in information technology (IT) and ample population of AI specialists. Additionally, private businesses are eager to assist military in integrating AI into defence industry. The fact that Tata Sons' owner N. Chandrasekaran is willing to help the armed services modernise shows how seriously India is taking the growing importance and practicality of artificial intelligence.<sup>44</sup>

### **2.1.2 AI- driven military upgrading by China and India affecting Pakistan's security**

China's efforts to modernise its military to a new level have recently been increased in an effort to challenge the status quo and to lead. China has recently begun integrating AI into the military. Therefore, both a regional and a worldwide impact will result from Chinese development. Given that India never fails to notice when China makes military advancements, this will result in an endless strategic domino effect. As a result, India has had to reconsider its military policy and chose to use AI in order to strengthen the military industry. The recently released Land Warfare Doctrine (LWD) 2018 clearly demonstrates the upgrading of Indian military doctrine. This causes Pakistan major threat because it cannot ignore the looming threat. India's aggressive and belligerent

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<sup>43</sup> R Reddy, "India and The Challenge of Autonomous Weapons." 2016 [https://carnegieendowment.org/files/CEIP\\_CP275\\_Reddy\\_final.pdf](https://carnegieendowment.org/files/CEIP_CP275_Reddy_final.pdf).

<sup>44</sup> Pranav Mukul, "Task Force Set up to Study AI Application in Military." The Indian Express. February 3, 2018. <https://indianexpress.com/article/technology/tech-news-technology/task-force-set-up-to-study-ai-application-in-military-5049568/>.

practices have always worried Pakistan. The US, China, and India might start a geopolitical chain reaction that eventually travels to Pakistan and influences it.<sup>45</sup>

India and China nuclear-armed nation in South Asia and its neighbourhood, are attracted in creating AI technologies for military applications. These states are each investigating military applications of AI in spheres of strategic importance, such as command-and-control, ballistic missile defence (BMD), early-warning, surveillance and reconnaissance (ISR) systems and intelligence, electronic warfare, unmanned underwater vehicles (UUVs) and unmanned aerial vehicles (UAVs); and cyberwarfare, with varying scales and budgets for research and development (R&D).<sup>46</sup>

Numerous issues that Pakistan and India are dealing with have an indirect or direct impact on regional dynamics and their bilateral relations. The ongoing rivalry among two bitter enemies has been harmful to the security and peace of the region. In light of this, the fast military modernisation of China and India is escalating the arms race and instability both locally and globally. According to a number of agreements, the US is providing India with military and technological support as well, and this will have an important effect in near future. US is concentrating on China and trying to support India against it as part of its Rebalancing Asia ideology, but is ignoring significant consequences that this may have in future.<sup>47</sup>

The nuclear rivalry among Pakistan and India has recently been more intense in South Asia. Both Pakistan and India are increasing number of nuclear weapons they possess

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<sup>45</sup> Saif Ur Rehman and Dost Muhammad, "China-India Competition: An Appraisal." *Journal of Global Peace and Security Studies (JGPSS)* 2 no. 1, (2021): 15–25.

<sup>46</sup> Lora Saalman, "Artificial Intelligence, Strategic Stability and Nuclear Risk." *SIPRI*. June 1, 2020. <https://www.sipri.org/publications/2020/other-publications/artificial-intelligence-strategic-stability-and-nuclear-risk>.

<sup>47</sup> Vittorio Macagno, "Artificial Intelligence as the Upcoming Revolution in Military Affairs. The Cases of the United States and China through the Lens of Strategic Culture." *Univerzita Karlova* (2022) <https://dspace.cuni.cz/handle/20.500.11956/174500>.

and creating new delivery methods including cruise missiles and nuclear-powered ballistic missile submarines (SSBNs). Emerging technologies like unmanned vehicles and cyberwarfare are also being developed by them. In several of these systems, military AI is important.<sup>48</sup>

Rear admiral Sanatan Kulshrestha from India investigated the tremendous destructive potential of cutting-edge military technology. He discusses advancements in nanotechnology, swarming, and nano energetic materials, as well as their military implications, before outlining Indian efforts to create AI-driven technologies. He contends that the fusion of these technologies and AI will have an impact on the creation of future strategic weapons and may enable the creation of terrible devastation comparable to a nuclear attack without the radiation.<sup>49</sup>

Stability-instability problem still remains in South Asian region (mainly between Pakistan and India). While countries' control over nuclear weapons has prohibited all-out war, low-intensity armed conflict or limited war cannot be ruled out any time in future. Any innovation in region, whether it is creation of small conventional arsenals, information warfare or unmanned aerial vehicles, disturbs peace in the region. Therefore, the inclusion of AI in military contributes to region's endemic instability.<sup>50</sup>

The impact on regional stability might be detrimental if India supports deployment of machine learning and autonomy in critical systems like missile systems or nuclear weapon systems. The detecting capabilities can trigger armaments race or give wrong

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<sup>48</sup> Walter C Ladwig III, "Indian Military Modernization and Conventional Deterrence in South Asia." *Journal of Strategic Studies* 38, no. 5 (2015): 729–72. <https://doi.org/10.1080/01402390.2015.1014473>

<sup>49</sup> Sanatan Kulshrestha, "The Indian Perspective on the Massive Damage Potential of Advanced Military Technologies." *SIPRI*. 2020.

<sup>50</sup> Kartik Bommakanti, "Indian Military Platform Modernisation: Uncertainties, Challenges, and Progress." Policy commons. *OBSERVER RESEARCH FOUNDATION* (September, 2021) <https://policycommons.net/artifacts/1819225/indian-military-platform-modernisation/2556684/>.

impression of the abilities of the enemy, prompting pre-emptive strikes in the area. Given that data is the essential component of machine learning, human spoofing attacks or data poisoning also pose a real concern.<sup>51</sup>

Rajnath Singh, the Indian defence minister, launched 75 AI-focused defence surveillance robots in July 2022 with the intention of stationing them at Line of Control (LoC) in New Delhi, India. Dozens of these monitoring robots have reportedly been put into use. Silent Sentry, crucial technology developed by Indian Army's design office to fill gaps in monitoring networks, stood out among them as one of the most eye-catching goods. In the event of a potential war in disputed region, India will have upper hand thanks to this advanced surveillance by Indian defence, and Pakistan's failure to recognise this risk could cost both nation and people of Kashmir.<sup>52</sup>

Data has grown to be the world's most valuable resource as a result of globalisation, increased connectivity, and a flourishing IT industry. India seems to be aware of this fact. Although India continues to stick to conventional and sub-conventional doctrines to trouble Pakistan, it cannot be argued that the next or possibly the one after the next battle between India and Pakistan will be completely a cyber or AI war. However, India's AI intelligence and advancements in technology will confidently supplement its defence in the conflict.<sup>53</sup>

Although the fact that India portrays China as the primary driver behind the militarization of AI, Pakistan is also at the centre of the underlying objectives. India and Pakistan have traditionally had tense relations. The significance of conventional

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<sup>51</sup> Jay Wise, "Satellite Imagery, Remote Sensing, and Diminishing the Risk of Nuclear War in South Asia." *JSTOR*. (2018) <https://www.jstor.org/stable/resrep20228>.

<sup>52</sup> Jigyasa Sahay, "Silent Sentry: How Rail-Mounted Robot Artificial Intelligence Will Enhance Surveillance along LoC?" *India.com*. (July 2022) <https://www.india.com/science/silent-sentry-how-rail-mounted-robot-artificial-intelligence-will-enhance-surveillance-along-loc-kashmir-5510329/>.

<sup>53</sup> Aditya Bhan, "Observer Research Foundation." ORF. 2022. <https://www.orfonline.org/>.

weapons is still important despite the fact that both of these states have nuclear. By utilising autonomous weapons in battles that both governments engage in and taking into consideration fact that conventional weapons cannot outperform autonomous weapons, India might turn to AI to gain power over Pakistan. Additionally, with its current arsenal of weapons, India may make up for the shortcomings it currently faces. For instance, the air control centre instructed Wing Commander Abhi Nandan to escort the jet backward when Pakistan retaliated following the Balakot debacle as he was approaching the Line of Control. He was unable to follow this advice, though, because of the numerous jammers in the nearby area, which prevented him from receiving the message. Artificial intelligence, on the other hand, is free of these technical hiccups and might be more effective.<sup>54</sup>

India is indicating a doctrinal shift in the nuclear stance at the policy level as well. The 1999-published Nuclear Doctrine of India makes the argument that India won't deploy nuclear weapons unless its civilians are subjected to a biological, nuclear or chemical attack somewhere across globe. This reflects India's nuclear weapon policy of No First Use (NFU). However, Rajnath Singh, India's defence minister, in August 2019 has said that the country's NFU policy would alter. These changes widened Pakistan's vulnerabilities. This strategy could influence Indian decision-makers to undermine Pakistan's deterrence, upsetting the stability.<sup>55</sup>

The incorporation of AI will make it simpler for India to undertake highly deceptive cyberattacks against Pakistan. Similarly, as autonomous drones can monitor up to 250

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<sup>54</sup> Adil Sultan, "Artificial Intelligence Revolution: Contemporary Trends and Implications for the Future of Warfare." *Journal of Security & Strategic Analyses* 8, no. 1, (2022): 07-24.

<https://doi.org/10.57169/jssa.008.01.0158>.

<sup>55</sup> "No First Use Nuclear Policy May Change in Future, Says Rajnath Singh on India's Defence Strategy." *India Today*. August 2019. <https://www.indiatoday.in/india/story/india-no-first-use-nuclear-policy-may-change-rajnath-singh-1581403-2019-08-16>.



kilometres into an adversary's territory, intensive monitoring can also be carried out. This will lead to various forms of surveillance. Additionally, India believes that AI is essential for further widening the conventional warfare gap with Pakistan and enforcing expensive weapons competition in region generally and with Pakistan in specific while taking into account Pakistan's economic situation.<sup>56</sup>

India accounts for 13% of all global sales of large armaments, making it the largest importer in the world. The economic situation in Pakistan does not support weapons competition with India. Pakistan is attempting to close gaps with the help of its domestic defence industry and increased professionalism. S-400 and Barak-8 long-range air defence systems, fifth-generation aircraft, long-endurance unmanned aerial vehicles, spy satellites and P8I anti-submarine surveillance and reconnaissance aircraft are all being purchased by India. Indian military tactics are directly endangering Pakistani sovereignty with all these advanced war armaments.<sup>57</sup>

China has frequently been mentioned in investigations into national security concerns of governments regarding the use of Chinese software and hardware as surveillance tools by the Chinese government. With China's growth in technological innovation and artificial intelligence (AI), the fear escalated over time. According to a 2021 investigation by the Washington Post,<sup>58</sup> Huawei AI intelligence helped government agents track down political people of interest, manage ideological re-education, and monitor prison facilities. Because of this, a number of western countries have banned Huawei gear from their upcoming 5G telecom networks out of concern that the

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<sup>56</sup> Shaza Arif, "Emerging Trends of Artificial Intelligence in South Asia and Its Implications for Pakistan." *NUST Journal of International Peace and Stability* II no. 2, (2019) <https://doi.org/10.37540/njips.v2i2.31>.

<sup>57</sup> Masood Rehman and Muhammad Khan, "Evolution of New Indian Military Strategy: Implications for Pakistan." (2019) <https://margallapapers.ndu.edu.pk/site/issue/download/14/97>.

<sup>58</sup> Eva Dou, "Documents Link Huawei to China's Surveillance Programs." *Washington Post*. December 14, 2021. <https://www.washingtonpost.com/world/2021/12/14/huawei-surveillance-china/>.

company will help Beijing acquire sensitive data and conduct surveillance. As of right now, Huawei is prohibited from using its 5G networks in all five members of the 'five eyes' intelligence alliance: the United States, United Kingdom, Australia, Canada, and New Zealand. In relation to Pakistan, it's crucial to draw attention to the continuing legal dispute between Business Efficiency Solutions (BES) and Huawei for spying there that began in 2021. BES brought the accusations against Huawei, stating that the two businesses collaborated on the Safe City project in Lahore and that BES created 8 software systems to collect data from government agencies, control access to buildings, monitor drones, and analyse social media. Even though the Chinese business's contract with BES was ended, the software has not yet been uninstalled, and according to BES, the Chinese company is still using the technology to analyse important data from Pakistani government agencies.<sup>59</sup>

China appears to be changing its security strategy in Pakistan, going from expressing full trust in Pakistan's security agencies to wanting its own security existence throughout state to defend Chinese interests. The Chinese government requested its own defence agency in Pakistan following attack on Confucius Institute in Karachi in order to safeguard its citizens and property.<sup>60</sup> The pressure from China may increase as a result of the escalating political unrest and the reappearance of terrorist operations in Pakistan. Pakistan should be increasingly concerned about both incorporation of AI technologies into its military commands and expansion of security presence. China's R&D organisations and AI research facilities are continuously developing and creating

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<sup>59</sup> Vincent Ni, "Documents Link Huawei to Uyghur Surveillance Projects, Report Claims." The Guardian, December 15, 2021. <https://www.theguardian.com/technology/2021/dec/15/documents-link-huawei-uyghur-surveillance-projects-report-claims#:~:text=Documents%20link%20Huawei%20to%20Uyghur%20surveillance%20projects%2C%20report%20claims>

<sup>60</sup> ADNAN AAMIR, "China Wants Own Security Company to Protect Assets in Pakistan." Nikkei Asia (June 2022) <https://asia.nikkei.com/Politics/International-relations/China-wants-own-security-company-to-protect-assets-in-Pakistan>

AI-enabled defensive technologies. As Chinese military becomes more intelligent, Pakistan must get ready for the effects this will have on its nuclear weapons, scientists, radar systems, and overall, all security players.<sup>61</sup>

India holds a strategic advantage over Pakistan in South Asia, which gives them the confidence to act aggressively, such as by executing a pre-emptive strike against Pakistan's nuclear assets or delivery systems. This advantage weakens Pakistan, which has an adverse effect on South Asia's deterrent stability. Since both countries have been bitter rivals since their origin, the region is more unstable and prone to war. Between these countries, there have been few significant wars throughout history. Indian capabilities are forcing Pakistan to adopt appropriate security measures to counter Indian threats, which has sparked an arms race between longtime rivals.<sup>62</sup>

AI is a ground-breaking piece of technology for the defence industry. It increases the level of autonomy in combat significantly. States have chosen to integrate AI into the military sector in order to acquire a comparative advantage over their adversaries. As a result of AI's exceptional level of efficiency, certain states have begun to militarise it more quickly than was previously the case. It greatly exceeds human intellect, which results in more sophistication and a reduction in errors. As a result, the great countries view it as a tool to tip the scales of power in their favour.<sup>63</sup>

### **2.1.3 Pakistan's position**

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<sup>61</sup> Dr Atif Ali, "Artificial Intelligence Potential Trends in Military." *Foundation University Journal of Engineering and Applied Sciences* 2, no. 1, (2021): 20–30. <https://doi.org/10.33897/fujeas.v2i1.380>.

<sup>62</sup> Shafqat Ali, "India Triggering Arms Race in South Asia: Pakistan." *The Nation*. July 31, 2020. <https://www.nation.com.pk/31-Jul-2020/india-triggering-arms-race-in-south-asia-pakistan>.

<sup>63</sup> M Cummings, "Artificial Intelligence and International Affairs Disruption Anticipated." Chatham House. 2018 <https://www.chathamhouse.org/sites/default/files/publications/research/2018-06-14-artificial-intelligence-international-affairs-cummings-roff-cukier-parakilas-bryce.pdf>

The future belongs to artificial intelligence for the entire human race. The problem with Pakistan is that it isn't even in an AI development race. Pakistan's limited resources and ongoing internal unrest prevent it from understanding that warfare would become algorithmic and intelligent in the future, for which Pakistan is presumably unprepared. Pakistan will really suffer as a result of China and India developing their AI capabilities. The nation must be aware of its weaknesses and should take decisive action to fend off potential threats in the fields of cyber security and AI development.<sup>64</sup>

India in support of its hegemonic ambitions and security needs will have catastrophic effects on regional security. Since 1998, Pakistan has worked to develop its strategic capacity towards India in an effort to maintain deterrent stability in the region. Despite its low resources, Pakistan would be forced to invest in AI given the development of advanced technologies like AI and India's massive investment in it. Because failing to do so could tip the balance of power in India's favour and damage the region's overall stability and deterrence. AI-enabled missile and satellite systems can see, track, and precisely hit their targets; submarines can be located and attacked by anti-submarine technologies and swarms, which lowers the stability of deterrence. India would certainly feel more confident as a result of its strong anti-submarine capabilities at the same time.<sup>65</sup>

Pakistan cannot ignore the South Asian emerging trends in AI. According to Land Warfare Doctrine 2018, it is no longer a mystery that India would use AI technology in the military. This won't pass without Pakistan reassessing its position in the field of AI. Following the Balakot attacks, the Indian government recently demonstrated its war

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<sup>64</sup> Ayesha Zafar, "The Evolving AI Arena in the Neighbourhood: Implications and Options for Pakistan." (2022) <http://irs.org.pk/Focus/07FocusAug22.pdf>.

<sup>65</sup> Sushant Singh, "The Challenge of a Two-Front War: India's China-Pakistan Dilemma'. Stimson Center. April 19, 2021. <https://www.stimson.org/2021/the-challenge-of-a-two-front-war-indias-china-pakistan-dilemma/>.

fever. Therefore, in the near future, the strategic patterns will drastically change. Given its current situation, Pakistan might be said to be significantly falling behind in the race towards AI. Although Pakistan has made certain technological advancements, it still lags behind other nations. There are a number of factors contributing to this artificial intelligence race's inadequacy, including a shortage of finances, data, IT specialists, and the level of mathematics taught in Pakistani curricula that is insufficient for artificial intelligence.<sup>66</sup>

In December 2018, when President Arif Alvi announced a campaign "Presidential Initiative for Artificial Intelligence and Computing" (PIAIC) to promote learning, research, and economic potential in artificial intelligence, blockchain, and cloud computing, artificial intelligence (AI) became a priority for Pakistani policy.<sup>67</sup> The first official statement outlining Pakistan's goals in that sector is this initiative. Pakistan has begun projects like the National Centre for AI (NCAI), and Department of Robotics and Intelligent Machine Learning at NUST as a result of realizing the importance of AI today. However, Pakistan appears to face significant obstacles in its quest to continue to succeed in this area.<sup>68</sup>

President Alvi emphasised that AI will be crucial for Pakistan's future military capabilities when he delivered the PIAIC. He specifically brought up the use of AI in cybersecurity and misinformation efforts, as well as in military applications like

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<sup>66</sup> Aamna Rafiq, "Militarisation of Artificial Intelligence and Future of Arms Control in South Asia." *ISSI* (August 2021) <https://issi.org.pk/militarisation-of-artificial-intelligence-and-future-of-arms-control-in-south-asia/>.

<sup>67</sup> "Presidential Initiative for Artificial Intelligence & Computing (PIAIC)." Netlify.app (2023) <https://piaic.netlify.app/>.

<sup>68</sup> Gulshan Bibi, "Implications of Lethal Autonomous Weapon Systems (LAWS): Options for Pakistan." *IPRI Journal* 02 no. 02, (2018) <http://repository.pastic.gov.pk/jspui/handle/123456789/1245>.

avionics, smart bombs, and unmanned combat air vehicles (UCAVs).<sup>69</sup> He also stated that in order to provide the most military value, Pakistan will need to pay close attention to the issue of how it integrates humans and AI.<sup>70</sup>

The National Initiative for Artificial Intelligence and Security (NIAIS), which the government of Punjab province released in 2019, has a similar focus on enhancing national cybersecurity and AI capabilities. While this programme strives to bridge the talent gap between the needs of business and academic institutions, it also takes into account the implications for the strength of the country's defences.<sup>71</sup>

Pakistan has only a few AI military applications. Modern "tactical unmanned aerial vehicles" (UAVs) have recently been added to the Pakistan Navy Fleet, along with maritime patrol aircraft, with the aim of improving ISR capabilities.<sup>72</sup> Pakistan developed advanced military armed drone in 2019 that was essentially enhanced version of Burraq, which had previously been launched. This domestically produced military combat drone equipped with "Selex Galileo technology" is capable of destroying the target from a height of 15000 feet.<sup>73</sup>

The Pakistani military institutions have not yet released any formal statements or strategic documents outlining their goals or strategies for AI. Pakistani military organisation as a whole has so far given AI little attention. However, it appears that a conversation is only beginning on the subject. For instance, in March 2018, retired

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<sup>69</sup> Arif Alvi, "Pakistan's Place in Artificial Intelligence and Computing." The News, January 2019. <https://www.thenews.com.pk/print/421124-pakistan-s-place-in-artificial-intelligence-and-computing>

<sup>70</sup> IRPR. "Inter Services Public Relations Pakistan." Wwww.ispr.gov.pk. (December 2018) <https://www.ispr.gov.pk/press-release-detail.php?id=5115>.

<sup>71</sup> "NIAIS (National Initiative for AI & Security)." n.d. [Wwww.niais.org](http://www.niais.org) .

<sup>72</sup> "Patrol Aircraft, Latest Drones Added to Pakistan Navy Fleet." News. 2020. <https://www.thenews.com.pk/print/593758-patrol-aircraft-latest-drones-added-to-pn-fleet>.

<sup>73</sup> "Pakistan Launches Indigenous Advanced Military Armed Drone with Selex Galileo Technology Missiles System." Times of Islamabad. September 6, 2019. <https://timesofislamabad.com/06-Sep-2019/pakistan-launches-indigenous-advanced-military-armed-drone-with-selex-galileo-technology-missiles-system>

commander of the Pakistani Fleet Vice Admiral Arifullah Hussaini said, future of warfare does not belong to conventional means, but rather AI.<sup>74</sup>

The Pakistani government has increasingly thought about the larger security opportunities and concerns offered by the development of AI in military systems, as seen by Pakistan's participation in convention on Certain Conventional Weapons (CCW) on LAWS. They also demonstrate what Pakistan has already designated as a redline for the application of AI in warfare. In fact, Pakistan was among the first nations to back the idea of banning LAWS.<sup>75</sup>

Currently, little can be said regarding Pakistan's potential use of recent AI advancements for nuclear-related reasons. Pakistan is not likely to pursue complete automation of its military command and control through the use of AI. Pakistan's perception of a threat from India will influence its efforts to deploy AI for deterrent purposes. In this context, a few military analysts from Pakistan are worried about India's advancement in AI capabilities that would enhance its space-based early-warning and intelligence-gathering capabilities. This is seen as possibly endangering Pakistan's capacity to maintain its nuclear deterrent.<sup>76</sup>

Pakistan is a nuclear-armed state that is least equipped to benefit from current AI developments for nuclear deterrence-related reasons. The PIAIC's very existence is a realisation that Pakistan's ability to create AI technology for both military and civilian

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<sup>74</sup> Komal Ali, "Artificial Intelligence (AI), Machine Learning (ML) and Implications for Pakistan on 20th August 2019 'Strategic Vision Institute (August, 2019)

<sup>75</sup> "First Session of the CCW Group of Governmental Experts (GGE) on Lethal Autonomous Weapons Systems." 2018. [https://docs-library.unoda.org/Convention\\_on\\_Certain\\_Conventional\\_Weapons\\_-\\_Group\\_of\\_Governmental\\_Experts\\_\(2018\)/2018\\_LAWSGeneralExchange\\_Pakistan.pdf](https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Group_of_Governmental_Experts_(2018)/2018_LAWSGeneralExchange_Pakistan.pdf)

<sup>76</sup> Saima Sial, "Military Applications of Artificial Intelligence in Pakistan and the Impact on Strategic Stability in South Asia." *Stockholm International Peace Research Institute*. (2020) [https://www.jstor.org/stable/pdf/resrep24515.13.pdf?refreqid=excelsior%3A299d106868697a51c85d1d446b9e7b48&ab\\_segments=&origin=&initiator=&acceptTC=1](https://www.jstor.org/stable/pdf/resrep24515.13.pdf?refreqid=excelsior%3A299d106868697a51c85d1d446b9e7b48&ab_segments=&origin=&initiator=&acceptTC=1)

reasons is still in its infancy. There are numerous flaws in Pakistan such as there aren't enough qualified AI engineers. In terms of enabling technology as well as infrastructure it is also heavily reliant on foreign technology. Also, Government's investment was only \$3.3 million in 2018, which is comparatively low.<sup>77</sup>

The cost of creating AI and integrating it with military systems is the biggest barrier of all. This calls for a greater allocation of financial resources, which is impossible without a solid economic foundation. However, additional funding must be set aside for activities and technology including AI. In order to protect interests of significant global players who have mastered AI, there is continuing discussion about regularization of AI through treaties and laws, although under guise of avoiding its military usage. Pakistan needs to be well informed about this global political and strategic trend.<sup>78</sup>

## **2.2 Theoretical framework**

Theory of international relations called structural realism, also referred to as neorealism, emphasises distribution of power between states as main driver of their behaviour. It claims how states interact is determined by the structure of the international system, which is characterised by the anarchic nature and states pursuit of self-interest. We can examine the effects of China and India's military modernization efforts on Pakistan while using structural realism.

The distribution of power is emphasised by structural realism as a crucial aspect of international relations. As regional powers, China and India have made enormous investments in military modernization, including the incorporation of AI technologies.

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<sup>77</sup> Fakhur Durrani, "Govt Allocates Rs1.1 billion for Artificial Intelligence Projects." THENEWS. (April, 2018) <https://www.thenews.com.pk/print/306187-govt-allocates-rs1-1-billion-for-artificial-intelligence-projects>

<sup>78</sup> Sachin Chitturu and Oliver Tonby, "ARTIFICIAL INTELLIGENCE and SOUTHEAST ASIA'S FUTURE." *McKinsey Global Institute (MGI)*. (2017)



By improving their military capabilities, this modernization may change the regional power balance.

According to structural realism, states are motivated by a security dilemma in which an attempt to boost one state's security may result in an increase in the security of other states. Pakistan may see a threat to its security as India create cutting-edge AI-based military capabilities. Pakistan may feel pressured to increase its military spending in response, worsening the security situation.

According to structural realism, nations work to preserve a power balance to protect their interest and security. Pakistan might aim to equalise this power gap as China and India increase their military prowess through AI. To balance the perceived threat from its neighbours, it could explore partnerships, purchase cutting-edge weapons, or improve its own AI.

Additionally, structural realism emphasises the likelihood of regional instability and weapons competitions. Because Pakistan and other nearby nations feel the need to keep up, an arms race in the region could result from China and India's military buildup. As a result of this arms race, the situation could become more tense, there would be a greater chance of conflict, and there would be more instability.

The theory of structural realism acknowledges the influence of alliances on state behaviour. Pakistan may seek deeper connections with major powers, like United States, in response to China and India's military modernisation, in an effort to balance power in the region. Such partnerships may have an impact on the stability of the region and the geopolitical environment as a whole.

The developments in artificial intelligence by Pakistan's neighbours may have a number of effects. It might create a problem for regional security, forcing Pakistan to act and strengthen its own armed forces in order to preserve the balance of power. An arms race and heightened tensions in the area might follow from this. Through the perspective of the security dilemma, this theoretical framework seeks to examine the effects on Pakistan of Chinese and Indian military modernisation under artificial intelligence (AI). According to the security dilemma, nations attempt to boost their security may unintentionally worsen the insecurity of other states, thereby triggering a reaction of hostility and distrust. This framework will examine how China and India's accomplishments may be viewed by Pakistan in terms of military modernization and AI, the potential repercussions for regional stability, and feasible mitigation measures.

## Chapter 03: RESEARCH METHODOLOGY

The current chapter discusses the study's methodology and explains the approaches the researcher used. A research methodology defines the methods and approaches employed to locate and evaluate data about a certain study subject. It's a method by which researchers plan their research to enable them to use the chosen research tools to accomplish their goals.<sup>79</sup>

### 3.1 Research epistemology

#### 3.1.1 Research paradigm

The broad theoretical foundation that directs your research strategy is referred to as the research paradigm or philosophy. Interpretivism is paradigm that has been taken into consideration in this thesis.

**Interpretivism:** Interpretivism holds that knowledge is subjective and socially created. It highlights the value of context, many viewpoints, and interpretations. To examine the perspectives, attitudes, and narratives of important stakeholders for military modernization under AI, interpretivist approach has used qualitative methodologies including interviews, case studies, and discourse analysis. It fits in nicely with study questions that examine how security is seen subjectively, how threats are perceived, and how technological improvements affect regional dynamics.

#### 3.1.2 Ontological approach

Your grasp of the nature of reality and the entities under study is referred to as the ontological approach. Constructivism is an ontological stance that has been taken into consideration in this argument.

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<sup>79</sup>Divya Sreekumar, "What Is Research Methodology? Definition, Types, and Examples.", (2023)

**Constructivism:** According to constructivism, perceptions and interpretations on both an individual and a group level shape reality. It acknowledges that the subjective perceptions and interactions of diverse individuals will determine the effects of military modernization under AI. To understand how policymakers, military leaders, and specialists view and react to China's and India's military modernization ambitions, a constructivist approach would entail examining their narratives, beliefs, and relationships. It has been in line with research issues that seek to comprehend the arbitrary effects of AI-driven military modernization on security dynamics and policy decisions.

### 3.2 Research approach

The set of procedures a researcher employs to carry out a study with the goal of generalising a particular context or presenting a particular finding to generalise the issue is known as the research methodology. There are three types of research approaches: abductive, inductive, and deductive. In deductive research, hypothesis, a theory, or generalisation is the starting point, and it is subsequently tested by observation and data collection. Using a top-down approach, the researcher formulates a general hypothesis before testing it with detailed observations. Deductive research is frequently employed to verify a theory or investigate a well-established notion.<sup>80</sup> Using an approach known as "inductive research," researchers gather and examine data in order to formulate theories, conceptions, or hypotheses that are based on trends and observations found in the data. It employs a "bottom-up" methodology, where the investigator begins with particular findings before progressing to broader hypotheses or concepts.<sup>81</sup> Combining deductive and inductive thinking is known as the abductive approach. It entails forming

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<sup>80</sup> John W. Creswell and J. D. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (Thousand Oaks: SAGE Publications, 2022).

<sup>81</sup> "Inductive vs Deductive Research: Difference of Approaches." QuestionPro (April, 2023)

educated assumptions or hypotheses in light of accepted theories or observations, followed by data collection to verify or improve these assumptions.<sup>82</sup> For this study, researcher has employed a deductive research approach.

### **3.3 Research strategy**

A researcher's plan or approach for carrying out a study, gathering data, and responding to particular research questions or hypotheses is referred to as their research strategy. Depending on the exact nature of the research challenge, the kind of data needed, and the overall study plan, several research strategies are used. The following explains a few typical research techniques: Surveys involve collecting data from a large sample of individuals through questionnaires, online forms to gather information on their opinions, attitudes, behaviours, or characteristics. In experimental research, an independent variable is manipulated while other factors are controlled to see how it affects a dependent variable. It seeks to demonstrate cause-and-effect connections. A qualitative research method called grounded theory aims to produce theories from data. It uses inductive reasoning, where themes and patterns are allowed to develop from the data rather than starting with preconceived notions.

This research has applied a mixed research strategy i.e., qualitative interviews and content analysis. In order to get in-depth insights, firsthand accounts, or personal experiences relevant to the research topic, interviews have been carried out. This research has also carried out content analysis. The main focus for content analysis is on primary sources such as government official platforms etc.

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<sup>82</sup> Jamie Thompson, "A Guide to Abductive Thematic Analysis." (2022) <https://nsuworks.nova.edu/tqr/vol27/iss5/17/>.

### **3.4 Population and sampling**

The participants in the qualitative interviews are those who have direct information, experience, or expertise related to the subject of the study. Experts in artificial intelligence, professionals in associated fields, government officials as well as other stakeholders with relevant knowledge fall under this category.

The population for content analysis is from primary sources, with a primary emphasis on official government sources. Press releases, policy papers, official declarations, and other sources directly issued or supported by government bodies pertaining to the subject of the research fall under this category.

Purposive sampling is the method used for the qualitative interviews. Using this approach, participants are chosen based on their ability to offer rich, in-depth information about the study questions. Experience, expertise, and relevance to the research topic are the determining factors in the selection process. Previous research, relationships with organisations, and professional networks are all used to identify potential volunteers. AI experts were contacted by researcher for study. Initially, LinkedIn was primarily used by researchers to find AI expertise. The researcher then got in touch with them to ask if they would be interested in taking part in interviews. Meetings were arranged with them by the researcher according to their availability. Beforehand, a questionnaire was provided to them. While some participants answered over email, others did so through in-person interviews.

A systematic sampling strategy is used for content analysis. This entails systematically choosing a representative sample from the wider pool of official government media platforms. To make sure that the sample chosen for analysis is representative of the whole amount of content available, a particular time period or a predetermined selection

of documents was picked. Within the limitations of the study scope, this approach seeks to capture an all-encompassing view of the primary sources. The majority of the data included in the study came from government websites, with an emphasis on current data. Since the information from these sources was the most readily available and appropriate for the research, the focus was mostly on data from the science and technology ministries in China and India.

### **3.5 Data collection and data analysis**

The researcher used the purposive sampling technique to identify and contact possible participants. Researcher used professional associations, personal networks, and direct communication with AI specialists, professionals, and stakeholders. The researcher identified the right people who are knowledgeable about the research questions or topic or have relevant experiences. Such as academics, researchers, think-tank analysts, policy advisors, military personnel, defence strategists, or retired personnel with expertise in defence planning and regional security dynamics all be considered among these experts. Government officials and policymakers were also included.

Investigator obtained participant's informed consent by explaining the goal of the study, the confidentiality policies, and the fact that participation was optional. In order to ensure that the structured interview guide was in line with the research objectives and promoted in-depth responses, the researcher created a set of open-ended questions. The chosen participants were contacted to schedule interviews. Researcher by using mail to conduct qualitative interviews allowed for flexibility and the ability to reach participants from a variety of geographic regions in addition to in-person interviews. Researcher recorded interviews and wrote up the transcripts for analysis.

### **3.6 Ethics**

Ethical consideration involved in this research are as follow:

- No help is taken from ghostwriter to complete my research.
- Bahria university guidelines are followed in my research.
- Proper references are given to sources.
- To ensure the validity of the research undertaken, all protocols are strictly observed when completing the research.



## **CHAPTER 04: ANALYSIS AND FINDINGS**

### **4.1 The AI arms race: China and India's military pursuit of artificial intelligence**

The application of artificial intelligence (AI) to military plans has become a crucial factor in determining a country's military might and strategic advantage in the current environment of international geopolitics. Leading this revolutionary change are two Asian giants, China and India, who are deeply involved in a fierce AI arms race. Through an examination of strategic goals, technological developments, and wider geopolitical ramifications, this research has unravelled the complex aspects of this competition.

A new era of combat has begun in the twenty-first century, one that is dominated by the incorporation of AI into military tactics. This technical weapons race belongs to two of the globe's most populous countries and emerging powers, China and India. Modern technology and military strategy have never been more integrated in the twenty-first century. With its ability to absorb data, make decisions on its own, and do predictive analysis, artificial intelligence (AI) is quickly becoming the next big thing in the fight for military supremacy. China and India are major investors in the advancement of AI-driven military weapons, as they are major players in this paradigm change.

Dr. Adil Sultan claims that 'China wants to compete with the US to remain at par and not to be seen at a disadvantage. Its primary focus had been on civilian applications of AI technology, but it would like to extract military dividends, especially if the US and other countries including India are venturing into military applications of AI. India is trying to assert itself as a technologically advanced country that can compete with China and possibly emerge as a hub for emerging technologies. In cooperation with the US,

this goal is being pursued. International Conference on Emerging Technologies ICET and similar projects are a couple of instances of their cooperative efforts.’<sup>83</sup>

It is essential to place the current AI weapons race within the historical context of China-India ties comprehend it. The foundation for a wary and competitive relationship was established by the 1962 Sino-Indian War and the ensuing military standoffs. The speed at which both countries are developing their defence capabilities and AI's emergence as a crucial frontier is a result of these historical conflicts.

According to Talha Ibrahim, ‘China and India attempt to take maximum advantage of AI as soon as possible before or during the possible negotiations over the AI arms control process to gain momentum. China is already achieving significant advancement in military AI. President Xi wants China’s Army to be prepared for traditional and modern warfare. China is seeking self-sufficiency in military AI. To compete with China, India has started developing its local AI defence industry and also collaborates with other states before AI regulation regime process starts. PM Modi has called AI as a revolution in new military affairs and also expressed desire to use AI military for offensive purposes. Indian National Security Advisor termed emerging technologies especially AI as a major influencer in geopolitics. According to the Indian military Chief, Manoj Mukund Naravane, India is looking for surgical strikes below the war threshold. Towards this end, it is investing in its kinetic and non-kinetic resources.’<sup>84</sup>

China's fast technological achievements show that it is committed to leading the world in AI by 2030.<sup>85</sup> The People's Liberation Army (PLA) has invested heavily in

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<sup>83</sup> Interview with Dr Adil Sultan (Dean FASS at Air University) (30<sup>th</sup> November, 2023)

<sup>84</sup> Interview with Talha Ibrahim (researcher at Centre for Strategic and Contemporary Research) (14<sup>th</sup> Dcemeber,2023)

<sup>85</sup> THE STATE COUNCIL PEOPLE'S REPUBLIC OF CHINA. “China Issues Guideline on Artificial Intelligence Development.” (2017)

unmanned aerial vehicles (UAVs), advanced decision-making algorithms, and autonomous systems. For China, incorporating AI into its armed forces is not just a technological goal; it also fits with its larger geopolitical goals. Documents and declarations issued by the Chinese government e.g. White Paper on Trustworthy Artificial Intelligence by China Academy of Information and Communications Technology,<sup>86</sup> place a strong emphasis on technological advances in fields like data analytics, autonomous drones, and facial recognition. The PLA's advancements in AI technology highlight China's goal of achieving technical domination in the military.

India has made significant strides in incorporating AI into its defence infrastructure, even though it may not be as outspoken as China in announcing its military AI breakthroughs. The Indian military and the Defence Research and Development Organisation (DRDO) have placed a strong emphasis on the creation of AI-based technologies for strategic decision-making, reconnaissance, and surveillance.<sup>87</sup> The Integrated Defence Staff's AI Strategy and Roadmap, for example, demonstrate India's commitment to advancing its own AI capabilities. With the goal of improving strategic planning, logistical optimisation, and predictive maintenance, India views AI as a force multiplier for its traditional military prowess.

China's overall strategic goals are closely related to its military AI research and development. AI is seen by the Chinese government as a mean of improving decision-making procedures, automating repetitive jobs, and gaining a clear technological advantage over possible rivals. China's goals of securing its national interests and gaining regional domination are in line with the official incorporation of AI into

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<sup>86</sup> 'CAICT - WHITE PAPER.' Wwww.caict.ac.cn. (2021)

[http://www.caict.ac.cn/english/research/whitepapers/202110/t20211014\\_391097.html](http://www.caict.ac.cn/english/research/whitepapers/202110/t20211014_391097.html).

<sup>87</sup> "Defence Research and Development Organisation - DRDO, Ministry of Defence, Government of India." n.d. Wwww.drdo.gov.in. <https://www.drdo.gov.in/>.

military operations. China's strategic alignment of AI with its wider geopolitical objectives makes it a powerful player in the international AI arms race.

India is focusing on using technology as a force multiplier, which is seen in its approach to military AI. One of the country's strategic goals is to use AI to improve traditional military capabilities. AI's significance for strategic planning, logistical optimisation, and predictive maintenance is emphasised in official declarations. The policy framework titled "AI for National Security and Defence" highlights the strategic importance of self-reliance in defence technology and expresses India's commitment to developing AI capabilities domestically.<sup>88</sup>

Dr. Shoaib Ahmed Khan argues that 'China and India have been investing significantly in AI-driven military modernization initiatives, each with distinct strategic goals concerning Pakistan. China aims to be dominant force in Asia, countering the US and India. China is making investments in Pakistan to secure access to ports such as Gwadar and commercial routes, as well as to guarantee stability in the region and Pakistan for its sophisticated military technology. AI-driven military innovations strengthen defence capabilities, which helps to protect these interests. India's primary focus is enhancing its national security, especially in light of historical conflicts and tensions with Pakistan. AI-driven military modernization is deemed essential for maintaining a robust defence against potential threats. India wants to strengthen its armed forces in order to offset China's increasing sway over the area. AI technologies play a key role in enhancing its defence systems' effectiveness and efficiency. India employs artificial intelligence (AI)-

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<sup>88</sup> "Ministry of Defence." n.d. INDIAai. <https://indiaai.gov.in/ministries/ministry-of-defence>.

driven technology to ward off possible aggression and stay ready for any conflict that may arise, including one with Pakistan.’<sup>89</sup>

The regional security dynamics are significantly impacted by China and India's growing AI arms competition. Neighbouring nations keep a careful eye on these advancements as both governments make significant investments in AI-driven military systems.<sup>90</sup> The regional balance of power is now more unpredictable due to the use of AI into military strategy. A growing number of people are worried about the region becoming unstable as China and India compete with one another for military and technological superiority.

Although there are many benefits to using AI in military applications, China and India face serious risks and hurdles. The application of AI to autonomous weaponry, surveillance, and decision-making raises many ethical questions. The possibility of inadvertent escalation brought on by cyberthreats or algorithmic mistakes is a common worry that requires global attention. For both countries, finding a balance between ethical issues and technological progress is a difficult task.

Regarding Pakistan's stance, Dr. Shoaib said that China's and India's AI-driven military developments could have a big influence on the balance of power in the area. The geopolitical environment in the area is made more complex by China's infrastructural and defence assistance to Pakistan and India's emphasis on enhancing its military might. Pakistan finds itself strategically impacted by these bordering states' competing interests. While maintaining a careful balance with India, the country regularly looks to China for defence and economic support. AI-driven military modernization is a tactic used by both China and India to safeguard their strategic objectives, solidify their

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<sup>89</sup> Interview with Dr Shoaib Ahmed Khan (CEO & Chancellor Sir Syed CASE Institute of Technology) (12<sup>th</sup> December, 2023)

<sup>90</sup> <https://x.com/SpokespersonMoD/status/1131900888337985536?s=20>

positions of security, and project influence throughout South Asia. These initiatives will affect Pakistan's geopolitical dynamics in the area in a variety of ways.<sup>91</sup>

China and India are engaged in an AI weapons race that offers both potential for cooperation and conflict in addition to rivalry. Global issues like cybersecurity risks and moral issues with AI growth may offer a common basis for diplomatic interaction. In addition, it is impossible to overlook the possibility of disputes resulting from miscommunications or misinterpretation in AI-driven military operations. In the age of AI-driven combat, striking a delicate balance between cooperation and conflict calls for a clear strategy.

AI arms race between China and India is changing the nature of international security. Both countries are making significant investments in the development of cutting-edge AI capabilities for military applications, motivated by strategic imperatives and historical conflicts. This competition has consequences that go beyond military ones; it affects regional stability and diplomatic ties. The world is keeping a careful eye on these technological developments, realising how difficult it will be to strike a balance between conflict and cooperation in the age of AI-driven combat. The fallout from the current technological arms race will have an impact throughout geopolitical contexts, influencing future military doctrines and diplomatic approaches.

#### **4.2 AI-driven military upgrading in China and India: Impact on Pakistan's security**

Pakistan is situated at the intersection of major geopolitical changes as a result of the rapid improvement of artificial intelligence (AI) in military capacities, especially in China and India, its neighbours' major developments have significant consequences for

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<sup>91</sup> Interview with Dr Shoaib Ahmed Khan (CEO & Chancellor Sir Syed CASE Institute of Technology) (12<sup>th</sup> December, 2023)

regional security. This analysis explores the complex ways that China's and India's AI-driven military modernization is impacting Pakistan's security environment.

According to Lt Gen (R) Muhammad Haroon Aslam, 'How much money a country is spending on AI is very important'.<sup>92</sup> Significant expenditures made by China and India in AI-driven military technology led to a technological imbalance in the region. Pakistan will have to stay up as both countries build advanced AI-driven systems for surveillance, reconnaissance, and decision-making. The ensuing technology divide raises questions about Pakistan's security vulnerabilities and may affect its capacity to maintain a strategic equilibrium.

As stated by Dr. Adil Sultan: 'For now China's AI developments do not impact Pakistan's security, but since India is competing with China and is building its military potential in the field of emerging technologies, it could lead to security implications in the future.'<sup>93</sup>

A state of strategic encirclement is created by China's Belt and Road Initiative (BRI), its military might in the area, and India's regional ambitions. The incorporation of artificial intelligence into military tactics amplifies these neighbours' surveillance capacities, which may have an impact on Pakistan's strategic independence. Pakistan's security interests face problems due to the possibility of heightened scrutiny and diminished manoeuvrability. The conventional balance of power and influence has been revolutionised by artificial intelligence, according to Talha Ibrahim.<sup>94</sup> India's ongoing ambitions to use AI to become a superpower may change the nature of its long-standing competition with Pakistan. It is unlikely that Pakistan will remain oblivious to India's

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<sup>92</sup> Interview with Lt Gen (R) Muhammad Haroon Aslam (IIPS President) (13 December, 2023)

<sup>93</sup> Interview with Dr Adil Sultan (Dean FASS at Air University) (30<sup>th</sup> November, 2023)

<sup>94</sup> Interview with Talha Ibrahim (Researcher at Centre for Strategic and Contemporary research) (14<sup>th</sup> Dcemeber,2023)

worries given their close geographic proximity. This can intensify hostilities and make Pakistan's security concerns more pressing. To remain relevant in the current geopolitical scene, Pakistan must reflect on India's bold advances in AI development.

Tughral Yamin agrees that 'Pakistan needs to carefully analyse its defensive systems and makes efforts to improve its decision-making capabilities to counter AI driven weapon platforms.'<sup>95</sup> The dynamics of regional security are further complicated by China and India's AI arms race. In a competitively militarised world where strategic posturing is driven by technology breakthroughs, the quest of advanced AI capabilities generates an atmosphere. In order to protect its security interests, Pakistan, which is positioned in this regional weapons race, needs to carefully manage shifting alliances and power dynamics.

AI increases the effectiveness of traditional security threats while simultaneously providing potential for more effective defence tactics. Tensions may increase as a result of autonomous weapon systems, improved observation, and quicker decision-making. In order to confront the changing nature of regional security issues, Pakistan's security apparatus needs to adjust to these new threats by making investments in countermeasures. The presence of Pakistan's nuclear weapons complicates the effects of AI-driven military advancements.<sup>96</sup> Concerns of stability and possible unforeseen repercussions arise from the introduction of additional variables brought about by the incorporation of AI within nuclear command and control systems. For regional security, finding the ideal balance between technical innovation and sustaining robust deterrence becomes crucial.

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<sup>95</sup> Interview with Dr Tughral Yamin (Senior Researcher at Institute of Policy Studies, professor and Dean at NUST) (3<sup>rd</sup> December, 2023)

<sup>96</sup> "ACDIS – Ministry of Foreign Affairs." n.d. <https://mofa.gov.pk/acdis/>.



Cyber threats can exploit the interconnectedness of AI systems in military infrastructure. Critical defence systems are more vulnerable to cyberattacks as China and India advance AI-driven military capabilities. To lessen the possibility of cyberattacks compromising Pakistan's national security, the country needs to make significant investments in cybersecurity measures.<sup>97</sup> Reevaluating its diplomatic and strategic relationships is Pakistan's response to the AI-driven military modernization taking place in China and India. Maintaining Pakistan's security objectives while cultivating positive relations with its neighbours is a difficult balance that must be struck while navigating this shifting terrain.

The financial expenses necessary for AI-driven military modernization could take funds away from improving society and the economy. This change may have an effect on the general stability and development of the region, which may have an effect on Pakistan's economic concerns and future cooperative efforts in the face of changing security difficulties. Humanitarian and ethical considerations are raised by the employment of AI in military applications. AI-driven decision-making algorithms and autonomous weapon systems have the ability to lessen human involvement in combat scenarios, which could have an effect on civilian populations. In order to address these moral issues and promote ethical AI use in military settings, Pakistan must participate in international conversations as a responsible global actor.

The main security implications for Pakistan, in the view of Dr. Shoaib Ahmed Khan, of China's and India's enhanced military capabilities through AI are that 'the advancements in AI-driven military capabilities by China and India may heighten Pakistan's perceived security threats. This perception could lead to increased tensions and a potential arms

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<sup>97</sup> "Advisory - Cyber Attacks on Pakistan's Critical Information Infrastructure Advisory No. 60)." n.d. FBR. <https://download1.fbr.gov.pk/Docs/20219231293929303AdvisoryNo.60-CyberAttacksonPakistanCriticalInformationStructure.pdf>.

race in the region as Pakistan seeks to maintain a balance of power.’<sup>98</sup> Pakistan may experience geopolitical pressure and diplomatic difficulties as a result of the changing power dynamics brought about by its neighbours' growing military capability. Pakistan's foreign policy and strategic decision-making may be impacted by this. There may be weaknesses in Pakistan's defence infrastructure as a result of the technical divide between that nation and its neighbours with regard to the integration of AI into military systems. This gap could make it more difficult for Pakistan to defend its defensive systems against possible attacks and increase the risk of cyberattacks.

The arms race brought on by improvements in AI-driven military capabilities has the potential to worsen regional instability by escalating tensions in South Asia. There may be more significant effects on the region's security and peace from this instability. Pakistan may come under pressure to quicken its military advancements in order to stay up with China and India with regard to the advancement of defence technologies facilitated by artificial intelligence. Pakistan's economy may be strained as a result of the increasing resource and spending on defence.

Pakistan has a variety of security concerns as a result of China and India's enhanced military capabilities thanks to artificial intelligence. These challenges include heightened threat perceptions, diplomatic difficulties, regional instability, technological gaps, and even economic strain. A comprehensive approach that strikes a balance between security requirements, diplomatic engagement, and economic stability is needed to address these issues.

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<sup>98</sup> Interview with Dr Shoaib Ahmed Khan (CEO & Chancellor Sir Syed CASE Institute of Technology) (12<sup>th</sup> December, 2023)

In conclusion, Pakistan's security has been significantly impacted by China and India's AI-driven military modernization. The evolving security landscape is shaped by a number of factors, including arms race dynamics, strategic encirclement, impact on traditional security threats, cybersecurity vulnerabilities, technological asymmetry, nuclear stability concerns, strategic alliances, economic implications, and humanitarian and ethical considerations. In order to protect Pakistan's national security interests in this age of technological transition, authorities must engage in diplomatic efforts and adaptable tactics to deal with these challenges with foresight.

### **4.3 Pakistan comprehensive approach**

To protect its national security interests, Pakistan must take a comprehensive and multifaceted strategy in light of China and India's AI-driven military advances. Acknowledging the complex effects of technology breakthroughs, Pakistan may meet these problems with a flexible and strategic framework.

According to Dr. Shoaib Ahmed, 'encourage substantial investments in AI research and development within Pakistan. Foster collaborations between academia, industry, and government to advance AI technologies for defence and security.' Investing in its own AI research and development capacity should be Pakistan's top priority. The country's indigenous AI capabilities can be accelerated by creating organisations specifically for that purpose and encouraging partnerships with foreign entities. This strategy not only guarantees Pakistan's technological independence but also establishes the country as a proactive participant in worldwide progress.'<sup>99</sup>

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<sup>99</sup> Interview with Dr Shoaib Ahmed Khan (CEO & Chancellor Sir Syed CASE Institute of Technology) (12<sup>th</sup> December, 2023)

Pakistan must use strategic diplomacy to negotiate the geopolitical issues brought forth by AI-driven military advances in the area. Pakistan may better balance its security concerns and take advantage of diplomatic chances for conflict resolution by forging stronger ties with both China and India while continuing to pursue an autonomous foreign policy. Pakistan needs to actively seek out strategic partnerships and alliances with other countries that have similar security concerns to its own. Joint military drills, technology transfers and intelligence sharing are examples of collaborative projects. These kinds of alliances strengthen Pakistan's ability to keep the balance of power in the area and act as a deterrent against possible threats.<sup>100</sup>

As per Dr. Shoaib Ahmed Khan, 'Pakistan is encouraged to make significant investments in AI research and development and is encouraged to improve cooperation between government, business community, and academia to develop AI for security and defence purposes. Pakistan needs to give developing skills in AI-related domains top priority.'<sup>101</sup> Create workshops, specialised training programmes, and collaborations with academic institutions to develop a workforce that is qualified to support Pakistan's AI capabilities. Create strategic partnerships with foreign defence contractors, IT companies, and AI specialists. Work together on cooperative R&D initiatives, technology transfer, and information exchange to support Pakistan's military capabilities powered by AI. To protect AI systems and networks from potential threats, strengthen cybersecurity measures. Provide moral standards and structures for the acceptable application of AI in defence while making sure that international laws are followed. Pakistan needs to launch programmes to create prototypes for incorporating AI into

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<sup>100</sup> "ACDIS – Ministry of Foreign Affairs." n.d. <https://mofa.gov.pk/acdis/>.

<sup>101</sup> Interview with Dr Shoaib Ahmed Khan (CEO & Chancellor Sir Syed CASE Institute of Technology) (12<sup>th</sup> December, 2023)

defensive systems and also test artificial intelligence applications in fields including cybersecurity, autonomous systems, surveillance, and military decision support tools.

Given its higher vulnerability to cyberattacks, Pakistan ought to improve its cybersecurity framework. Creating reliable methods for identifying and reducing cyberattacks on vital defence systems is part of this. National defences against emerging cyberthreats can be strengthened by cooperative efforts with international cybersecurity professionals.

Talha Ibrahim states that protecting national data requires bolstering cybersecurity. This covers projects like virus identification, software and hardware assessment, and the creation of cybersecurity parks. According to Talha Ibrahim, ‘significant number of countries have implemented policies related to AI. In 2020, the worldwide corporate investment in AI was around US\$60 billion, and it’s expected to increase by more than twice by 2025. This indicates potential opportunities for Pakistan to work together with these countries in the areas of AI development and policy formulation.’<sup>102</sup>

Dr. Shoaib Ahmed claims that in light of the vulnerabilities connected to cutting-edge technology, Pakistan must bolster cybersecurity measures to protect AI systems, networks, and data from potential cyberthreats or attacks.<sup>103</sup> Dr. Shoaib Ahmed also asserts that Pakistan ought to establish strategic alliances with top AI-focused countries, IT companies, and research institutes. But Tughral Yamin believes since AI technology

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<sup>102</sup> Interview with Talha Ibrahim (Researcher at Centre for Strategic and Contemporary Research) (14<sup>th</sup> Dcemeber,2023)

<sup>103</sup> Interview with Dr Shoaib Ahmed Khan (CEO & Chancellor Sir Syed CASE Institute of Technology) (12<sup>th</sup> December, 2023)

is still in its early stages, nations that already possess it will not be inclined to share the technology with Pakistan, especially if Pakistan has nothing to give in return.<sup>104</sup>

It is critical to create and uphold a code of ethics for the implementation of AI in military applications.<sup>105</sup> Pakistan should take a leading role in global debates on ethical AI usage by promoting laws that stop the spread of autonomous weapons and provide human oversight in crucial decision-making processes.

According to Dr. Shoaib Ahmed Khan, Pakistan ought to support certain legal frameworks which regulate AI in defence.<sup>106</sup> In order to govern the development, implementation, and application of AI in national security, Pakistan must involve policymakers in order to create laws that encourage innovation while maintaining accountability and ethical use of AI technologies. These laws and ethical guidelines must also be clear and transparent.

According to Dr Adil Sultan, ‘Pakistan continues to oppose militarization of AI and has been a vocal proponent of banning LAWS at the Conference of Geneva.’<sup>107</sup> Humanitarian concerns and the possibility that it could result in robotic, uncontrolled warfare are the main grounds for opposition. According to Dr. Adil Sultan, ‘pursuing AI in the military domain is likely to cost prohibitive and unnecessary.’ Pakistan ought to put more effort into using these technologies for business purposes. Pakistan can eventually develop its own capability, which is always available to be utilised for military objectives in the future, if necessary, with the improvement of its own capabilities and cooperation with external organisations. Pakistan must put more of its

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<sup>104</sup> Interview with Dr Tughral Yamin (Senior Researcher at Institute of Policy Studies, professor and Dean at NUST) (3<sup>rd</sup> December, 2023)

<sup>105</sup> “MOUs / Agreements – Ministry of Foreign Affairs.” n.d. <https://mofa.gov.pk/mous-agreements/>.

<sup>106</sup> Interview with Dr Shoaib Ahmed Khan (CEO & Chancellor Sir Syed CASE Institute of Technology) (12<sup>th</sup> December, 2023)

<sup>107</sup> Interview with Dr Adil Sultan (Dean FASS at Air University) (30<sup>th</sup> November, 2023)

attention into developing domestic capabilities and using AI for non-commercial purposes. One might always reap the benefits of military advancements as and when they materialise.

According to Dr. Shoaib Ahmed, it is important for Pakistan to have a strong AI infrastructure including data centres, processing power, data governance frameworks, and ethical AI applications for security and military.<sup>108</sup> According to Talha Ibrahim, to stay up with developments throughout the world, Pakistan needs to make investments in AI research and development. In this sense, universities can be very important as centres of research, innovation, teamwork, and synthesising the knowledge of various stakeholders.<sup>109</sup>

Pakistan ought to concentrate on economic diversification lessen the financial effects of AI-driven military improvements. The country may build an economy with greater resilience that is less vulnerable to resource diversion for military objectives by investing in industries other than defence. Similarly, in Tughral Yamin's viewpoint, 'Pakistan should start investing in AI technologies not only in the field of defence production but also for civilian spinoffs.'<sup>110</sup>

For Pakistan to fully benefit from AI technology, it is necessary that a qualified workforce in related disciplines be developed. The nation can guarantee that it has the human capital needed to create, execute, and sustain cutting-edge AI solutions by

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<sup>108</sup> Interview with Dr Shoaib Ahmed Khan (CEO & Chancellor Sir Syed CASE Institute of Technology) (12<sup>th</sup> December, 2023)

<sup>109</sup> Interview with Talha Ibrahim (Researcher at Centre for Strategic and Contemporary Research) (14<sup>th</sup> Dcemeber,2023)

<sup>110</sup> Interview with Dr Tughral Yamin (Senior Researcher at Institute of Policy Studies, professor and Dean at NUST) (3<sup>rd</sup> December,2023)

implementing educational reforms, providing vocational training, and working with industry specialists.<sup>111</sup>

In order to produce a trained workforce that is capable of advancing AI technology for national security objectives, Dr. Shoaib Ahmed suggests that Pakistan should prioritise skill development in AI-related disciplines by establishing specialised education programmes, training initiatives, and workshops.<sup>112</sup> As per Dr. Shoaib Ahmed Khan, in order to handle the security issues brought on by the AI-driven military modernization in the area, Pakistan is able and willing to work with other nations and international organisations.

Pakistan has a track record of pursuing alliances and diplomatic initiatives to address security-related issues. Pakistan already cooperates with think tanks to address security issues, collaborates with technological partners, performs foreign diplomacy and participates in regional forums like SCO. By facilitating information sharing, transfer of technology, and strategic collaboration to strengthen its defence capabilities, Pakistan may be able to lessen the security effects of its neighbours' military developments through cooperation with allies, global partners, and international organisations. These kinds of partnerships could be useful in reducing tensions in the region and promoting stability in the face of changing security dynamics brought about by military advancements fuelled by AI.

It is essential to actively participate in international forums and organisations that deal with disarmament, security, and AI. Pakistan has the ability to utilise these platforms in order to express its concerns regarding security, encourage cooperation in the

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<sup>111</sup> "Science Diplomacy – Ministry of Foreign Affairs." n.d. <https://mofa.gov.pk/science-for-sustainable-development/>.

<sup>112</sup> Interview with Dr Shoaib Ahmed Khan (CEO & Chancellor Sir Syed CASE Institute of Technology) (12<sup>th</sup> December, 2023)



development of international standards and regulations, and promote transparency in the military applications of AI. In order to stay ahead of the AI race and to learn from worldwide best practices, Talha Ibrahim also recommends Pakistan to pursue international cooperation.<sup>113</sup>

Stability demands addressing underlying conflicts in the region.<sup>114</sup> Pakistan might mitigate the possibility of military escalation caused by artificial intelligence breakthroughs by aggressively engaging in diplomatic initiatives targeted at conflict resolution. It's critical to keep the public informed and transparent about the potential effects of AI-driven military advancements. Informed decision-making is ensured by open communication with the public, which also helps policies that balance ethical considerations with the goal of safeguarding national security get support.

Pakistan must support centres for innovation or institutes dedicated to defence-related AI research. To promote creativity and expertise in AI technologies, encourage cooperation between governmental, academic, and private sector groups.<sup>115</sup> Pakistan may effectively utilise AI technologies for national security by putting these measures into place. This will ensure that the country is ready to respond to changing regional dynamics while maintaining ethical standards and resolving any security issues.

According to Dr. Shoaib Ahmed Khan, keeping up with developments and trends in AI worldwide is critical for Pakistan. Pakistan needs to make constant adjustments to tactics to take into account cutting-edge innovations and industry best practices for AI-

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<sup>113</sup> Interview with Talha Ibrahim (Researcher at Centre for Strategic and Contemporary Research) (14<sup>th</sup> Dcemeber,2023)

<sup>114</sup> "Joint Press Release on Meeting between Adviser to the Prime Minister on Foreign Affairs Sartaj Aziz and Afghan Foreign Minister Salahuddin Rabbani." Ministry of Foreign Affairs. (June 24, 2016) <https://mofa.gov.pk/joint-press-release-on-meeting-between-adviser-to-the-prime-minister-on-foreign-affairs-sartaj-aziz-and-afghan-foreign-minister-salahuddin-rabbani/>.

<sup>115</sup> "Launch of Digital Cooperation Organisation (DCO), Ministry of Foreign Affairs (November 26, 2020) <https://mofa.gov.pk/launch-of-digital-cooperation-organisation-dco/>.

driven military modernization.<sup>116</sup> Pakistan can efficiently manage the effects of its neighbours' AI-driven military modernization by implementing plans, thereby enhancing its own AI capacities for national defence and security.

It is essential to spend money on education and training to create a workforce knowledgeable about AI and associated technologies. This involves teaching young people how to think critically.<sup>117</sup> In order to keep Pakistan competitive on the world stage, research and development in AI and related subjects should be encouraged. As per Talha Ibrahim, 'the ministry has recently opened an IoT regime that allows companies to acquire licences at moderate amounts. IoT can help bring increased efficiency in sectors ranging from textiles to the defence industry.'<sup>118</sup>

To conclude, Pakistan needs to adopt a comprehensive and flexible approach to counter the impacts of AI-driven military modernization. Pakistan can effectively manage technological advancements and protect its national security in a dynamic global environment by implementing various strategies such as investing in domestic AI capabilities, fortifying diplomatic ties, diversifying the economy, improving cybersecurity infrastructure, adhering to ethical frameworks, cultivating strategic alliances, nurturing human capital development, participating in multilateral initiatives, advancing regional conflict resolution, and upholding transparency.

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<sup>116</sup> Interview with Dr Shoaib Ahmed Khan (CEO & Chancellor Sir Syed CASE Institute of Technology) (12<sup>th</sup> December, 2023)

<sup>117</sup> "Awareness | NT CERT." Pta.gov.pk. (2022) <https://ntcert.pta.gov.pk/awareness.html>.

<sup>118</sup> Interview with Talha Ibrahim (Researcher at Centre for Strategic and Contemporary Research) (14<sup>th</sup> Dcemeber,2023)

## CHAPTER 05: CONCLUSION

### 5.1 Conclusion and discussion

Since AI has both positive and negative uses, it seems obvious that unregulated AI research and development will have disastrous consequences for every aspect of human existence. The introduction of AI-powered weaponry will probably start a new arms race among the technologically advanced states. Additionally, the state would build an AI-based weapons system as a countermeasure. As a result, AI would become more militarised, which would minimise its potential benefits. Similarly, AI will alter our way of life rather than just revolutionise the battlefield. Humans could be at danger from killer robots. There isn't a single law or agreement that can stop industrialised nations from developing killer robots. AI has two uses, and its applications in civil society are very advantageous to all people. A lot of AI applications are being employed for civic objectives; hence, it should not be associated with negativity only. Its defence applications, however, carry a very high risk.

The aggressive ideological shift and large military build-up by India may threaten South Asia's deterrent stability. It is possible to claim, after careful consideration, that the conventional asymmetries that now exist between India and Pakistan are tolerable. However, in the future, Pakistan's military would find it challenging to equal the stark differences in conventional warfare, particularly when it comes to long-range air defence, nuclear submarines, armed unmanned aerial vehicles, long-range maritime surveillance planes, and spy satellites. In order to meet the standoff capabilities of Indian aircraft and to fight any additional aerial threats in the form of high altitude, long-range armed UAVs and various ballistic or cruise missile types, Pakistan must invest in anti-weapons, long-range air defence systems. The Pakistani military needs to

develop long-range, highly sophisticated anti-tank guided missiles in order to match the improved abilities of the Indian military. If the Indian mechanised troops were to manoeuvre quickly on the plains or desert, these skills would slow them down. To counter India's long-range air defence systems, Pakistan has to expand the quantity of Multiple Independent Re-entry Vehicles (MIRVs) and enhance the range, accuracy, and effectiveness of its ballistic and cruise missiles.

Furthermore, Pakistan has to purchase nuclear submarines in addition to long-range Submarine-launched ballistic missile (SLBMS) in order to guarantee Second Strike Capability. When it comes to conducting reconnaissance and surveillance deep within India, the Pakistani military has to improve its ISR capabilities and introduce Airborne early Warning and Control System (AWACS) and long-range/endurance UAVs.<sup>119</sup> In light of this, Pakistan additionally needs to invest in space assets, including as spy satellites, to obtain up-to-date intelligence on the location, troop movements, and deployment patterns of its adversaries. With such capabilities, Pakistan can counter any conventional military advantage held by the Indians and lessen the likelihood of a limited nuclear conflict. India needs to understand that using force to solve any issue in a nuclear environment is not an option. Both nations must be willing to be flexible and attempt to settle their differences through a genuine and continuous dialogue process.

The disparate rates of advancement suggest that three dominant powers in Asian security matrix will consolidate their military artificial intelligence at dissimilar intervals in the future. Amidst the hostility of the West, China is striving for AI self-sufficiency and is undergoing a military revolution through intelligent military technology. In an effort to match China, Indian defence organisations such as CAIR,

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<sup>119</sup> Malik Mustafa, "Pakistan's Military Security and Conventional Balance of Power." [https://www.issi.org.pk/wp-content/uploads/2014/06/1299827319\\_69386339.pdf](https://www.issi.org.pk/wp-content/uploads/2014/06/1299827319_69386339.pdf).

DRDO, ISRO, and DIAC are focusing on domestic military AI research, development, and experimentation. Moreover, India is using AI into its defence policy to advance the transition from experimental to real deployment.

Given the current and anticipated state of Indian artificial intelligence development, the hegemonic objective of Indian political and military leadership, and its strategic alliances with other nations, it is evident that Pakistan may have new challenge in the form of automated warfare in next ten years maybe. The stability of the weapons race, the deterrence equation, and the crisis management in South Asia would all suffer from these developments. In light of these regional security dynamics, Pakistan had to reassess its public stance and establish clear goals regarding the military's use of AI in order to preserve full spectrum deterrence.

Although Pakistan has a firm position opposing the weaponization of AI, it is unable to prevent other nations, particularly India, from developing military AI capabilities and incorporating them into force postures, defence plans, and doctrines. States may decide to align AI technology with arms control principles as a result of the global consolidation of AI technology. But the chances of a preventive worldwide ban on AI weapons are incredibly low.

Furthermore, China, Pakistan, and India all have official stances on AI arms control that are completely opposed to one another. A framework for AI arms control in Asia would be unlikely given the divergent official views on regulation of defence AI and the uneven advancement of AI capabilities. This calls for a critical evaluation of the current policy stance and a re-evaluation of how military AI might impact Pakistan's regional deterrence strategy. Pakistan should maintain an open mind with regard to the study and development of military uses of AI for its national defence, even as it embraces

principled stance in support of international legal framework to control testing, production, development and possible use of AI weapon systems.

The Indian government has started modernising its strategic forces in a comprehensive way. It is creating a specific BMD system and implementing SSBN as a new delivery method. India is making significant investments in its military to become a powerful force. The Modi administration appears to be prioritising nuclear modernization. India has finished its nuclear triad and possesses a wide variety of delivery systems.<sup>120</sup> Pakistan can obtain the newest missile technology thanks to its membership in the MTCR. BrahMos and other missiles' increased range demonstrates India's desire to become a regional power and dragged Pakistan into a costly arms competition.<sup>121</sup> Islamabad has taken steps to maintain strategic balance in order to maintain stability. Pakistan, which is fully aware of the negative effects of a nuclear arms race, will not react to India in kind; instead, it will act wisely when necessary. Pakistan's economy is impacted when it maintains parity with India.

The world's leading nations are moving closer to artificial intelligence. It appears that a fresh wave of the technological revolution is quickly approaching. It won't be long before this revolution spreads to other states as well. However, given that South Asia is already home to two arch-rivals whose histories are replete with deadly wars and sporadic conflicts, it may not be a wise decision to reproduce these patterns of militarization of AI there.

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<sup>120</sup> Ghazala Jalil, "Issue Brief on 'India's Nuclear Program: How Come It Is Not Seen as the "Fastest Growing"?' | Institute of Strategic Studies Islamabad." ISSI (October 6, 2023) <https://issi.org.pk/issue-brief-on-indias-nuclear-program-how-come-it-is-not-seen-as-the-fastest-growing/#:~:text=India%20is%20pursuing%20a%20triad>.

<sup>121</sup> "BRAHMOS Supersonic Cruise Missile - BrahMos.com." n.d. Wwww.brahmos.com. <https://www.brahmos.com/content.php?id=10&sid=10>.

India and Pakistan both nations frequently experience extremely high levels of tension, which has resulted in their involvement in small-scale battles. The leaders of both sides are aware that none of their nations can afford to go to war. According to this perspective, as soon as a dispute reaches a breaking point, de-escalation attempts should be made right once to prevent significant harm to the national security of the two sides. For instance, the US intervened to calm things down in the Kargil crisis once things got out of control. It should be noted, though, that weapons activated by AI lacks this kind of buffer during the de-escalation stage. The scope of crisis management will change if AI capabilities were integrated into military plans. This is because AI-backed weapons require such little processing times that they do not provide enough time to make the right decisions. These automated weapon's reaction would compromise the ability to make thoughtful decisions, which tends to defuse tense situations. There is a significant risk of escalation associated with this, which could lead to a serious crisis that is hard to manage. Pakistan is undermining this new evolution's strategic potential. Just as France's and Britain's nuclear arsenals do not constitute a threat to international security, neither does the militarization of AI by nations like China as well as the India. The world's superpowers are moving down the aisle towards AI.

India and Pakistan, two nation's internal instability, leadership, and bilateral connection make it impossible for them to go on such a risky and daring adventure together. Similarly, states with nuclear power define this zone. Militarising AI should be a last resort due to the deadly potential of nuclear weapons. It would disrupt regional strategic stability and increase the risk of accidental use, which might result in a catastrophic event with decades-long consequences. In an attempt to strengthen his political reputation and link himself to an anti-Pakistan narrative, Indian Prime Minister Modi has launched a series of exploits to win over supporters. Given that the military

revolution was declared a few months prior to the 2019 Indian elections, it is possible to conclude that this turned out to be more of a political than a military gesture.<sup>122</sup> There was no overt threat to India at the time of this revolution. But its leaders' war-hysteria has increased the threat to regional security. This will start an entirely new arms race within the region, and both nations will need to invest enormous sums of money to participate in it.

Therefore, rather of making this treat more intense, attempts should be taken to reduce it. Because India is the one bringing this technology to South Asia, the Pakistani government need to support academic institutions in their efforts to improve AI while also funding AI-related startup companies that would eventually serve as a foundation for modernising the armed forces. This is done in order to ensure that deterrence is strengthened even in the face of attempts by India to weaken it.

A high-profile military modernization programme and headline-grabbing increases in India's defence budget have worried experts, who fear these developments could threaten the traditional military balance that is seen to be responsible for preserving "ugly stability" in South Asia. Although these worries seem legitimate at first glance, more investigation reveals that there are still many reasons to be positive about the future of conventional deterrence.

India's defence procurement is still not living up to expectations; the country produces significantly less military might than its expenditures would indicate. On the other hand, Pakistan, with support from China and other countries, has stopped extreme asymmetry from emerging in the traditional military balance and has even closed gaps that were already there. Whether it modernises or not, the pessimists underestimate how little

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<sup>122</sup> ANIT MUKHERJEE, "The Great Churning: Modi's Transformation of the Indian Military." War on the Rocks. (May 5, 2021) <https://warontherocks.com/2021/05/the-great-churning-modis-transformation-of-the-indian-military/>.



force the Indian military could muster in a limited war with Pakistan. Therefore, it is improbable that Indian officials would come to the conclusion that they could either execute very successful airstrikes with minimal escalation risk or accomplish strategic surprise against Pakistan, both of which are prerequisites for deterrence failure. As a result, Pakistan's defence of its ongoing efforts to create tactical nuclear arms and delivery systems based on security concerns is unfounded. These systems do not improve Pakistan's military posture's deterrence value; rather, they merely raise the possibility of an unintentional nuclear exchange. Islamabad is diversifying and increasing the size of its nuclear arsenal for a number of reasons, but one of them isn't a sensible reaction to the danger posed by India's ongoing military modernization.

The application of AI in the field of national security poses unique difficulties because of its revolutionary consequences. In light of the evolving security landscape brought forth by ransomware, hybrid warfare, and the expansion of Internet of Things (IoT) technologies, artificial intelligence (AI) has caused disruption. Due to cyber-physical systems, it is now a complicated matter. Research released by Computer Emergency Response Team-India (CERT-In) states that during the first half of 2022, ransomware attacks in India increased by 51% over the same period the previous year.<sup>123</sup> According to different research, cyberattacks alone might cause losses of about US\$ 10.5 trillion a year by 2025.<sup>124</sup>

Controlling the flow of technology has become increasingly difficult as a result of non-state actors having easier access to AI-based technologies due to its dual use in both civil and military applications. Furthermore, as social media has grown in popularity, AI

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<sup>123</sup> K Kurmanath, "Ransomware Incidents up by 53% in India: CERT-In." BusinessLine (April 14, 2023) <https://www.thehindubusinessline.com/info-tech/ransomware-incidents-up-by-53-in-india-cert-in/article66736758.ece#:~:text=Ransomware%20incidents%20in%20India%20have>.

<sup>124</sup> Carmen Ene, "Council Post: 10.5 Trillion Reasons Why We Need a United Response to Cyber Risk." Forbes. (2023) <https://www.forbes.com/sites/forbestechcouncil/2023/02/22/105-trillion-reasons-why-we-need-a-united-response-to-cyber-risk/?sh=10cdfd583b0c>.

has integrated itself into these platforms, where it is used to propagate hate speech, disinformation, and radicalization thus escalating dangers to national security.

The wide-ranging impact and achievements of AI possess the potential to transform the existing power structures among countries. Moreover, nations with inadequate AI funding run the risk of losing their hegemony in the military and economy in the future.

The use of AI raises a number of ethical and legal considerations. Technology giants in the private market control the resources since AI is easily accessible and successfully implemented there, which opens the door to the weaponization of AI. Data availability or openness is a critical requirement for enabling the AI network, hence data access difficulties are among the troubling aspects of ethical dilemmas. Policies and procedures pertaining to data protection should be developed to support particular public data sources so that researchers can use private data to extract new insights. Data biases such as imbalanced datasets, racial difficulties, and data poisoning can have a significant impact on the effectiveness of AI systems and provide moral dilemmas. For instance, biased or discriminating data can result in incorrect facial recognition in picture classification software.

The opaque nature of AI algorithms makes it challenging for decision-makers to comprehend the decision-making process. This leads to apprehension about the criteria employed in automated decision-making, thereby fostering a climate of mistrust surrounding the deployment of these systems. The absence of international regulation around the development and application of AI-enabled weapon systems, such as LAWS, is another matter that needs to be taken into account. It will intensify the arms race and allow for massive power struggle between countries.

When AI-enabled systems fail and human lives are in danger, the issue of responsibility becomes crucial. As a result, creating guidelines and regulations to protect the application of AI systems is essential. Better collaboration in the digital sphere will be enhanced by stepping up efforts to create common standards and norms for the usage, development, and sale of AI systems. Developing uniform standards and regulatory frameworks is a topic of growing discussion on international forums, and this is a positive step towards optimising the use of new developments in emerging technologies such as artificial intelligence.

Technological developments in AI will gradually increase the risks, difficulties, and prospects associated with national security. AI has the potential to revolutionise the military by automating weapon systems and enhancing cyberwarfare. Many AI-enabled technologies can be utilised with both state and non-state actors due to its dual use nature, which makes it a factor to be concerned about for preserving security and deterrence. Regulations, data bias, ethics, and AI governance provide serious obstacles to the creation of a robust AI ecosystem. Investing in vital infrastructure, utilising the private sector's innovation ecosystem, and leveraging the advancements achieved by the top AI-producing countries are all necessary to establish a positive AI environment in Pakistan. It is critical to recognise the risks and difficulties posed by this technology and to establish public confidence in AI through education, legislation, and the development of human resources. Both indigenous development and bilateral and global cooperation aimed at implementing AI will be crucial to enhancing the value of our defence systems. These could include working together to develop technologies, exchanging technologies, and developing and standardising worldwide policies.

A major obstacle faced by security analysts, especially those focusing on South Asian arms control matters, is comprehending political and military cues within a logical

context. When it comes to openly discussing, publishing, and debating its military doctrine, the United States of America stands almost alone among nuclear countries. The 2003 version, which includes all the traditional elements i.e., no first use, effective minimum deterrence, and devastating nuclear retaliation, is the closest thing India has to a nuclear strategy.<sup>125</sup>

Regarding their nuclear stance and doctrine, China and Pakistan, to a limited extent, continue to be even less transparent. This strategic ambiguity in South Asia is exacerbated by the unpredictability surrounding the emergence of autonomous weapons, instability in the region, and the absence of effective CBMs at the moment. In this setting, increasingly advanced armament may lead to strategic errors due to human error, zealous leadership, or, with the introduction of autonomous weapons, machine error. The story of Lieutenant Colonel Stanislav Petrov, who worked at a Soviet early warning facility and decided not to respond to the automatic Oko nuclear missile early-warning system's false alarm, highlights the value of human judgement for crucial decision-making in extremely delicate command-and-control structures as well as the fallibility of automated systems.<sup>126</sup> In an automatic system like this, just one false positive could eventually lead to a calamity; thus far, only pure luck has kept it from happening. For this reason, it is crucial from a strategic and humanitarian standpoint that military strategists, public servants, and legislators set out to control and regulate the development and use of autonomous weapons on a worldwide scale.

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<sup>125</sup> Vipin Narang, "Five Myths about India's Nuclear Posture | 2013 | Publications | MIT Security Studies Program (SSP)." Ssp.mit.edu. <https://ssp.mit.edu/publications/2013/five-myths-about-indias-nuclear-posture>.

<sup>126</sup> Vincent Boulanin, "THE IMPACT of ARTIFICIAL INTELLIGENCE on STRATEGIC STABILITY and NUCLEAR RISK Volume I Euro-Atlantic Perspectives Edited by Vincent Boulanin." (2019) <https://www.sipri.org/sites/default/files/2019-05/sipri1905-ai-strategic-stability-nuclear-risk.pdf>.

The People's Republic of China (PRC) has been working hard in recent years to incorporate AI into its military capabilities. The nation has committed a substantial amount of money to these initiatives. Nonetheless, the function of artificial intelligence in the command architecture is still unknown and ambiguous as of yet; in fact, there has been contradictory data. China might be eager to explore AI-based weapons, which lessen the need for human intervention in ways that many other nations might not be willing to.<sup>127</sup> Additionally, Pakistan efforts are minimal, if not completely insignificant, in comparison to China's. For its own weapons systems to include AI applications, Pakistan will have to act strategically. This necessitates first determining which weapon systems should receive AI investments and for which missions AI might be useful. Pakistan should try to follow China's lead in some areas, such as the development of AI-enabled military capabilities.

Apart from selectivity and efficacy, there is a case to be presented for increasing cooperation with a state that has access to AI, like Japan. Pakistan needs better data at home. It has to develop human potential for Big Data analytics in addition to hiring skilled people to gather and process the data. Human intelligence is, after all, just as crucial to the development of cutting-edge technologies like AI. Even while governments typically conceal information on defence R&D, the Pakistan government should at the very least be transparent about its data practices and the investments it is making in fundamental civilian AI research. In addition to keeping an audit of civilian AI research, this will be helpful in setting priorities, tracking advancements, and coming up with new projects.

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<sup>127</sup> Joris Teer, "China's Military Rise and the Implications for European Security." <https://hcss.nl/wp-content/uploads/2021/11/Chinas-Military-Rise-2021-Nov.pdf> (2021)

The development and application of AI and Machine Intelligence (MI) in arms and warfare should be governed by laws and regulations that follow standards and lessons learned from the many arms control and weapons reduction policies whether in bilateral or multilateral forums.<sup>128</sup> To make these laws enforceable, they ought to be formulated under the parameters of the UN weapons control and disarmament forums. New ideas are required, as well as a precise description of the dangers and strategies for fending them off. The necessity to create regulations to stop the weaponization of technologies that humanity depends on, like cyberspace and artificial intelligence, cannot be overstated, notwithstanding the difficulty of doing so.

In upcoming years, autonomy and AI will bring about quick, unexpected, and fast advancements because of technological advancements in MI and AI. States must implement AI-based technology in order to best position themselves to keep up with advancements. To counter hostile defence strategies involving autonomy and artificial intelligence, the following actions must be taken: a.) establishing technical expertise; b.) creating military R&D resources and adopting a fast-follower strategy; c.) evaluating and monitoring the development in hostile states; d.) lowering the likelihood of miscommunication, misperception, and strategic mistrust; e.) investigating the lethality of AWS; f.) lowering the friction points in the political, diplomatic, and technological spheres; and g.) learning from previous innovations and defence strategies.

## **5.2 Limitations of research**

Researcher encountered number of obstacles during research on the topic of military modernization under AI:

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<sup>128</sup> Corinne Cat, "Governing Artificial Intelligence: Ethical, Legal and Technical Opportunities and Challenges." *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 376 (2133): 20180080. (2018) <https://doi.org/10.1098/rsta.2018.0080>.

- First of all, governments, made it more difficult to obtain full data by limiting access to sensitive data about their AI capabilities and its applications for military purposes. The inability to obtain an in-depth knowledge of the subject was hampered by this lack of transparency.
- Moreover, open dialogue and the release of particular information regarding AI uses in the military have been impeded by national security concerns. Governments have restricted access to vital data by prioritising the security of classified material over the dissemination of knowledge about their technological innovations.
- Accessing and interpreting information was also more difficult due to linguistic disparities example Chinese language, especially when working with policies, government papers and technical specifications. There have been problems with translation, which caused content to be misinterpreted and made the study process even more difficult.
- The politically sensitive subject of AI in military applications has complicated the study. The presentation of an impartial and objective analysis is impacted by geopolitical conflicts, researcher face challenges in navigating political factors.
- Furthermore, availability of some data types was limited due to ethical concerns about the application of AI in military applications. The research was further complicated by governments' reluctance to disclose knowledge about autonomous weapons or other contentious AI uses.
- Furthermore, publicly accessible data could be manipulated or edited to support a particular viewpoint. The selective dissemination of information by governments to influence public opinion or preserving a tactical edge presented

an additional obstacle to researchers seeking a thorough and impartial comprehension of the subject matter.



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**INTERVIEWS:**

Dr Adil Sultan (Dean FASS at Air University) (30th November, 2023)

Talha Ibrahim (Researcher at Centre for Strategic and Contemporary research) (14th December, 2023)

Dr Tughral Yamin (Senior Researcher at Institute of Policy Studies, professor and Dean at NUST) (3rd December, 2023)

Dr Shoaib Ahmed Khan (CEO & Chancellor Sir Syed CASE Institute of Technology) (12th December, 2023)

Lt Gen (R) Muhammad Haroon Aslam (IIPS President) (13 December, 2023)

## **APPENDIX A INTERVIEW GUIDES**

1. Considering Pakistan specifically, what strategic goals do you think China and India are attempting to achieve with their AI-driven military modernization initiatives?
2. In your opinion, what are the main security ramifications for Pakistan that arise from China's and India's improved military capabilities using artificial intelligence?
3. Is Pakistan able to work with other countries or organizations to address the security issues brought forth by the region's AI-driven military modernization?
4. In light of the shifting regional dynamics, what steps should Pakistan take, in your opinion, to build its own AI capabilities for national security?
5. How can international agreements or rules pertaining to the use of AI in military contexts affect the situation in South Asia, in your opinion?
6. Could you predict possible future for this region's military upgrading under AI and what would that mean for Pakistan?
7. In light of your knowledge, what suggestions would you make to Pakistan to help it deal with the impact from its neighbours' AI-driven military modernization?

## Shehla Zeb

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