Indian Growing Reliance on the Military Application of Artificial Intelligence Technology and its Impacts on South Asian Regional Security

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ABSTRACT

The advancement of information communication technology and its increasing global appreciation has pushed the whole international system towards a world of digital realities where the prevalence of Artificial Intelligence (AI) has become an undeniable reality and an irrefutable truth. This study seeks to explore the increasing dependency of modern defense systems of the states on AI technology because the mainstream defense planners of different states have started upgrading their conventional weapon systems with the help of AI technology. In the debate on the growing reliance of conventional arms forces of the states on the advanced means of warfare, the South Asian security environment cannot be overlooked. While studying the impacts of AI technology on South Asian regional politics, this study endeavored to describe the Indian quest for empowering its conventional war-fighting capabilities with the support of AI specific modern weapon systems which leave worse impacts on Pakistan's strategic calculations. This study provides a glimpse of the deteriorating regional security environment of South Asia under the shadows of modern warfare technologies. It is an analytical study which tried to measure the increasing insecurities of India against China, and its direct impacts on Pakistan's regional standing. The theoretical description of the main argument has been obtained from the theory of neorealism which appropriately explains the ongoing strategic competition between Beijing and New Delhi, and its unavoidable impacts on Pakistan's security. In the end, the findings of this study attempted to forecast an intense future of South Asian regional politics in which the AI-specific arms race will alter the ongoing strategic features of India-Pakistan strategic competition.

Key Words: **Artificial Intelligence (AI), Military Industrial Complex (MIC), Autonomous Weapon Systems (AWS), India-Pakistan Rivalry & South Asia Security.**

Introduction

The association of modern warfare technologies with the international system cannot be separated from the specially the regions under strict strategic competitions of states. The states involved in major conflicts generally prefer to adopt modern warfare technologies for the effective up gradations of their regular armed force against their potential rivals. The strategic competitions of states

generally force their leaders to integrate the modern warfare technological with their regular armed force with the belief that the possession of advanced defense force enables the regular armed forces of the states to push their rival states at disadvantageous positions in case of any direct armed conflict. An appropriate application of this scenario can be seen in the South Asian region, where the regional security environment is persistently intensifying under nuclear shadows. The decades-long strategic rivalry between New Delhi and Islamabad has transformed the regional politics of South Asia into an intense security environment due to the possession of nuclear weapons by India and Pakistan. The formal political authorities of both states are determined to expand their defensive capabilities beyond the existing ones while increasing their reliance on emerging warfare technologies. For the acquisition of modern warfare technologies, the mainstream defence planners of India and Pakistan have started obstinately emphasizing Artificial Intelligence (AI) technology which could lead the regular armed forces of both states towards the empowerment of their conventional war fighting capabilities with the help of various Autonomous Weapon Systems (AWS) (Leys, 2018). The AWS are commonly known as the Lethal Autonomous Weapon Systems (LAWS) and have been called killer robots by the international community due to their automated functioning mechanisms in the regular military operations. The arrival of these weapon systems in the international system has fascinated many states where; India and Pakistan are no exceptions (MacDonald & Howell, 2019). The strategic communities of India and Pakistan have decided to incorporate the emerging AI-supported different unmanned weapon systems to the conventional war fighting capabilities of their regular armed forces. In this way, the AI-infused modern weapon systems have altered the traditional wisdom attached to concept of security and defense. It has provided a new dimension to the conventional war fighting capabilities of the states, as described by Kenneth Payne in his recently published book (Payne, 2022). According to Payne, the persistently increasing role of automated weapons systems in the regular armed forces of the states will redefine the concept of security between states. In this debate, the South Asian regional politics cannot be overlooked where the mainstream defense planners of both India and Pakistan are more inclined to equip their regular armed forces with the advanced warfare capabilities.

A co-authored study of Rizwana Abbasi and Saeed Uz Zaman *Changing Patterns of Warfare between India and Pakistan* endorsed that the application of new technologies in the regular armed forces of India Pakistan is reshaping the conventional patterns of warfare in South Asia because the modern warfare technologies have fascinated the mainstream defence planners of New Delhi and Islamabad (Abbasi & Uz Zaman, 2023). Both authors agreed that the Indian defense industry is taking the lead in the prevailing environment of AI-specific arms race India is taking the lead as it always remained a trend setter in the South Asian regional politics. The Indian point of view has been introduced by Baldeep Singh Gill in his scholarly investigation *Artificial Intelligence and Policy in India*.

The Gill's efforts echoed the position of India in the race of AI technology in which the mainstream legislative circles of New Delhi are deeply engaged in achieving landmark developments in the modern technologies (Gill, 2020). Based on the literature produced by different academic figures, it can easily be maintained that the arrival of these fully-autonomous and semi-autonomous weapon systems the South Asian region has introduced an AI-specific arms race in which the strategic communities of New Delhi and Islamabad have started appreciating the emerging role of modern warfare technologies in South Asia.

The national security documents of India and Pakistan have also formally accepted the increasing appreciation of their respective governments to the growing modern weapons trends. The Indian government, in its Land Warfare Doctrine-2018, has formally mentioned the increasing emphasis of the Indian Army on AI technology by mentioning the potential areas of AI applications in the defence sector. In response to the formal concerns of New Delhi on the possession of hi-tech armed devices, the government of Pakistan designed similar measures to upgrade the war fighting capabilities of its regular armed forces. The standard declassified version of the National Security Policy of Pakistan 2022-2026 has mentioned the significance of AI technology for Islamabad, parallel to highlighting the role of advanced technology in research and development. Additionally, the governments of both states have started cultivating bilateral collaborative connections with the technologically advanced and economically developed nations, which could provide both nuclear rivals of South Asia the additional channels of obtaining modern warfare technologies. In the race to increase strategic bilateral collaborations of both states with the technologically advanced Military Industrial Complexes (MICs) of the world, New Delhi has signed various levels of strategic partnerships with several states from across the world, whereas Islamabad is investing its diplomatic and commercial efforts in the international community to counterbalance Indian standing in the international strategic affairs. Apart from the present asymmetrical balance in the growing strategic connections of New Delhi and Islamabad with the extra-regional powers, the indigenous defence industry of India is progressing in the field of AI. It has produced various unmanned weapon systems under different state-sponsored projects. In reaction, the mainstream defence planners of Pakistan have started emphasizing the allocation of sufficient national resources in the domain of AI technology. The Indian pursuit of establishing its strong armed forces with the support of IA technology, New Delhi is primarily determined to secure a hegemonic position in its home region. This strategic aspiration of New Delhi has compelled Islamabad to remain strong-minded in keeping its home region stable through various counterbalancing measures to Indian regional hegemonic designs.

Thus, the existing academic debates on the AI technology and its relevance to South Asian politics mainly revolves around the ongoing advancement of India defense forces and their strategic manifestations in the New Delhi's mainstream

defense planning. A thin layer of literature has been maintained by few authors on the increasing reliance of New Delhi on the advanced warfare technologies generally, and AI technology specifically. The inseparable association of New Delhi's mainstream defense planning with modern warfare technologies is fundamentally inherited in the classical maxims of Indian strategic thinking, which is academically defined by Robert M. Geraci in *Future of Artificial Intelligence: Perspectives from India and the U.S*. The book primarily tried to explain the position of India in the AI technology. Indian growing reliance of advanced technologies have created an in inseparable connection between India mainstream IT industry and its dynamic defense industry (Geraci, 2022). The Indian defense preparedness in the AI domain has been validated by various reports of independent research institutes. The Indian academic sources admitted that the increasing focus of New Delhi on the advanced military technologies is a response to the changing dimension of warfare in the world politics, as mentioned in a paper published by The United Service Institution of India. The analysis of Commander Manish Chowdhury called the emerging scenario of technological warfare has triggered a "Remote Control War" in the world consisting of various AI-supported robotics and autonomous weapon systems. The advancement of Indian weapon system with the support of AI technology has rarely been remained a main focus of leading academic circles of international community. Very few authors attempted to study the New Delhi's security configurations under the shadows of AI technology. Ajey Lele's *Disruptive Technologies for the Militaries and Security* emphasized the use of AI technology in different domains of defense in India. This study slightly mentioned the Indian position in the evolving competition of cutting-edge technologies in the contemporary strategic competitions of the world (Lele, 2019).

The application of AI technology in the defense industry has been maintained in another study *India's Military Modernization: Strategic Technologies and Weapons Systems* (Basrur & Golpalaswamy, 2015). Moreover, the academic survey of Vijay Kumar Saxena in *The Amazing Growth and Journey of UAVs & Ballistic Missiles Defence Capabilities: Where the Technology is Leading to* (Saxena, 2013) provides the initial details of Indian domestic defense industry and its evolving association with the advanced warfare technologies. Thus, the leading literature concerning the Indian AI-supported weapon modernization tendencies and its impacts on the regional security environment of the nuclearized subcontinent remained an area of less scholarly attention in the world. The majority of authors focused the application of AI technology in the Indian weapon industry without maintaining a connection of this advanced war-fighting capabilities of India on the New Delhi-Islamabad strategic competition.

Based on this scenario, it can easily be maintained that the influx of AI technology in the nuclearised subcontinent has initiated an AI-specific arms race between the pair of nuclear weapon states. The presence of decades-long conflict between New Delhi and Islamabad has created a multileveled strategic

competition between both nuclear powers, and it has engaged the leading circles of international intellectual communities in analyzing the impacts of nuclearisation on the regional security environment of South Asia. Without paying substantial attention to the prevailing trends of advanced technologies in the enduring India-Pakistan rivalry, the leading circles of global strategic communities have marginally explored the nature and extent of the AI arms race in South Asia. The growing strategic collaborations of both New Delhi and Islamabad with different extra-regional powers in the domain of modern warfare technologies are sufficient to validate that the AI-specific arms competition has been started between two nuclear powers in South Asia. Therefore, the central theme of this paper attempted to explore the rising interconnectedness between the AI-supported weapon systems and the conventional defense management mechanisms of New Delhi and India. It is an academic endeavor to rationalize the presence of an AI arms race between two South Asian nuclear neighbors, parallel to analyzing the implications of this scenario on Pakistan. In short, this paper intends to maintain an analytical account of various arguments proving the existence of AI-specific arms competition in the regional complex security environment of South Asia while estimating its worse impacts on the regional strategic equilibrium between New Delhi and Islamabad. It is a descriptive study rationalizing the South Asian security environment under the probable shadows of an AI-specific arms race between New Delhi and Islamabad which is presently at its initial stage. With the support of structural realism, the theoretical foundation of Indian increasing reliance on the advanced weapon system and its worse impacts on Pakistan's strategic calculations have been maintained in this study, while considering the growing reliance of both states on the military-oriented applications of AI technology.

The Military Application of AI Technology

An appropriate understanding of AI technology is a prerequisite to comprehend the debate on the emerging cutting-edge technologies in the field of security and defense generally and its relevance to the regional security environment of South Asia specifically. The study of Mingxi Wu *Intelligent Warfare: Prospects of Military Development in the Age of AI* is pertinent to mention here, because this study explained that the arrival of AI technology in the military domain. The application of AI in the defense has introduced various advanced weapon systems with multifaceted automated capabilities, according to Wu. Wu's recently published book is a futuristic study discussing the AI-specific trends of warfare in the international system due to the increasing appreciations of the states to the military-centric AI technology (Wu, 2023). The basic idea of AI refers to the functioning of digital machines, as a substitute of human intelligence. These machines are digitally designed to perform specific tasks in the desired directions without human involvement. The replacement of human intelligence with AI-

supported computer devices makes the automated functions of these machines efficient than the humans (MacDonald & Howell, 2019). The hi-tech automated functions of these devices have replicated the basic features of the humans in managing multiple tasks with high accuracy, according the existing literatures on AI technology. The existing literature have a loosely-structured consensus on the concept of AI, which explains a unique digital combination of computer machines and human intelligence, which could be divided into four types; reactive machines (using intelligence to perceive and react), limited memory (ability to store data for the predictions of potential decisions), theory of mind (make decisions based on the predictions of other decisions), and self-awareness (performing operations supported by human-level consciousness). The first two types explain the nature of contemporary developments in AI, whereas the other two features emphasize the futuristic dimensions of AI. Based on these characteristics of AI-machines, the use of advanced technologies makes these AI-machines capable of performing four basic functions, thinking humanly and acting humanly, along with thinking rationally and acting rationally (Priyadarshini, Mehra, Sehgal, & Singh, 2022). Parallel to the usage of AI technology in the peaceful civilian domains, the application of this advanced technology in the defense industry has introduced different sophisticated and advanced military devices across the world. In this way, the military application of AI technology has upgraded the existing defensive capabilities of the states where the great powers are the trendsetter and the promoters of modern warfare technologies in security and defense, as mentioned in *Artificial Intelligence and the Future of Warfare: The USA, China, and Strategic Stability* (Johnson, 2021). The use of AI technology in the military domain has initially introduced by the defense industries of the great powers, and the strategic communities of the great powers started altering their conventional war-fighting capabilities under the shadows of advanced technologies. This argument could be legitimated in the contemporary world politics where US and China have jumped into a technological war. The ongoing US-China strategic competition has recently started witnessing competition of both states in the AI domain, and the governments of both states have decide to invest in the AI domain. Besides Washington and Beijing, the security architectures of great powers have started emphasizing the allocation of multiple economic resources to the development of modern war-fighting capabilities consisting on various automated functions, and this trend has intensified the international security environment. In the words of Josh Luberisse, the AI is leaving significant impacts on the world politics, and it has altered the geopolitical calculations of the states (Josh, 2023). The production of AI-specific weapon systems has introduced four types of AWS which have modernized the conventional war-fighting capabilities of states in five different domains; land, water, underwater, air, and space. The automated functions of these weapon systems have inaugurated a race of Unmanned Systems Technology (UST) in the world, because the UST has provided different semi-autonomous and completely autonomous armed devices to

the states. With the support of UST, the advanced defense industries of the states have started manufacturing the four major kinds of autonomous vehicles, which can be recognized as Unmanned Ground Vehicles (UGV), Unmanned Combat Aerial Vehicles (UCAV), Unmanned Surface Vehicles (USV), and Unmanned Underwater Vehicles (UUV). The UGVs are capable of functioning in extreme environments and challenging situations, whereas the UCAVs are commonly known as drones of various combating features. The UCAVs generally perform the tasks of surveillance and target identification. Moreover, the USVs are naval drones capable of meeting different combat challenges on the water surface, and the UUVs are recognized internationally as underwater drones (Johnson, 2020).

The debate on modern technological trends has challenged the conventional wisdom attached to the existing defense systems of the states with the rising appreciation of states on AI weapons systems around the world. The development of semi and fully-automated conventional weapon systems worldwide has revolutionized the traditional war-fighting capabilities of the regular state armies. It has advanced the traditional defensive system of the states and enabled the regular forces of the states to identify and target the enemy with high precision and short-time features. The role of these cutting-edge technologies in the defense sector has revolutionized the weapon industries of states across the globe and dramatically increased the commercial interests of leading weapon industries of states. Thus, the defense and security deals between different governments have started emphasizing the trade of AI-specific highly sophisticated weapon systems and defense technologies. The increasing trade volumes of these sophisticated weapon systems between states have introduced a new trend in the in the commercial interests of the states (Tadjdeh, 2015). Different international organizations and independent research institutions have measured the production of AI-specific military devices by developed states such as the United States, the United Kingdom, China, Russia, Israel, and South Korea. The Human Rights Watch has mentioned these states and called for timely responses from the international community against the spread of human-less weapon systems while calling them killer robots (Martino & Merenda, 2021). Seven European countries (Spain, Poland, Netherlands, Italy, Frace, Greece, and Germany) created a drone user club, and their governments are agreed in 2013 on a broader joint project for manufacturing drones. Akin to the European joint efforts for developing UAVs, Turkey, Iran, Taiwan, India, and Pakistan have also taken certain steps in developing drones (America, 2016). In the case of India and Pakistan, the acquisition of drone technology and its advancement in the New Delhi-Islamabad strategic competition adversely affects the politics of the South Asian nuclearised subcontinent. In the global debates on the prevailing wave of AI-specific strategic competition in South Asia, the role of Indian defense planners cannot be ignored. Indian strategic community has preferred to acquire the AI-supported modern

weapon system against its neighboring China and Pakistan without estimating its impacts on the regional security environment on nuclearized subcontinent.

Indian Reliance on AI

Indian objective of keeping its conventional arms forces modern and advance has been formally acknowledged in the *Land Warfare Doctrine-2018 (LWD-2018)* of the Indian Army. The declassified version of the LWD-2018 proclaims a conjunction with the Joint Doctrine of the Indian Armed Forces-2017 (JDIAF-2017) (Joshi, 2013). The LWD-2018 defined the path of the Indian defense system and security planning to prepare the Indian Armed Forces for future contingencies with the help of advanced technologies. The official document of the doctrine emphasizes the use of emerging technologies against the potential threats in the context of future warfare. The doctrine document categorically explained the prevailing shadows of robotic wars in the international system based on AI technologies. The LWD-2018 added the effective integration of soldiers, AI, and robotics into the mainstream war-fighting capabilities of the state (Joshi, 2013). The LWD-2018 discussed the government's vision for creating a countrywide techno-centric environment in which it is mentioned that the Indian army will persistently pursue techno-centric combating capabilities with the help of improving IT skills of the nation. In the declassified version of the doctrine document, the domain of AI has been considered significant for New Delhi's strategic planning, along with other emerging defense technologies such as "Quantum Computing, Nano Technology, High- Energy Lasers, Directed Energy Weapons, Hypersonic Weapons etc so as to cater for high technology threat of Swarm Attacks including Drones, Laser and Pulsed Microwave Weapon Systems and Injection of False Information." (Joshi, 2013) Another formal document of the Indian Ministry of Defence and the Department of Defence Production provided a comprehensive survey of the Modi government's efforts for promoting a countrywide culture of AI technology by taking different policy measures.

The report *Artificial Intelligence in Defence (AiDef)- The New Age of Defence: Presenting AI Preparedness of the Country in Defence* is an updated overview of major milestones achieved by the Indian defense industry in the field of AI (Plan & Delhi, 1956). The theme of the AiDef, published in July 2022, and it has provided a list of seventy-five different AI-supported products while calling these achievements an integral part of the *Azadi ka Amrit Mahotsav* (the celebrations of the Indian 75th independence anniversary) (Plan & Delhi, 1956). *Azadi ka Amrit Mahotsav* is a patriotic initiative of the Modi government for recalling the major achievement of the Indian nation in the history of seventy-five years. The techno-centric accomplishments of the Indian nation have been recognized officially by the Indian Prime Minister, Defence Minister, and the Minister of State for Defence and Tourism. The indigenously developed hi-tech weapon systems are mainly designed by the Defence Research & Development

Organization (DRDO) under the supervision of the Indian Ministry of Defence. The DRDO has established a Centre for Artificial Intelligence & Robotics (CAIR) with an exclusive focus on the fields of AI Robotics, Command and Control, and Information and Communication Security.

These products are helpful for the maintenance of secure battlefield information and communication management mechanisms (Dirican & Sciences, 2015). The CAIR exclusively emphasizes Command Control Communication and Intelligence (C3I) systems, Intelligence Systems and Unmanned Systems, and Information Security. The high rate of CAIR's progress has ensured the improvement of the Indian Armed Forces in the domain of information technology, mainly consisting of AI-specific defense production. In addition to the DROD and its various hi-tech initiatives for developing multifaceted advanced weapon systems, the Indian Ministry of Electronics & Information Technology is actively taking specific measures for the improvement of a countrywide IT culture. The Ministry's officials consistently provide their regular updates on the progress of the Indian IT industry in the field of AI technology and its multidimensional applications in the country (Finlayson et al., 2021). The available online reports on the legislative measures and policy frameworks of the Indian government also highlighted the engagement of the mainstream IT industry of India in the AI domain. An online database *Indiaai* has also been established by the Indian government to provide an overview of New Delhi's vision of AI technology and its socio-political manifestations across the country. These initiatives mainly provide a glimpse of New Delhi's preparedness for bringing hi-tech weapons systems to India while emphasizing AI technology (Kim & Ethics, 2021).

The theoretical attributes supporting the core argument of this paper have been maintained with the help of neorealist thoughts originating from the Waltzian description of realism. The Waltzian neorealism explains the structural forces of international system and their inevitable impacts on the positions of various states located in different regions (Waltz, 2008). In contrast to state-centric explanations of classical realist thoughts, the champions of neorealist thoughts have emphasized the structure of power competition between states, while identifying it as the fundamental source of shaping international politics. The work of Waltz explained the role of international system's structure in shaping the behaviors of states under the persistently evolving international environment of power distribution between states (Guzzini, 1998). Waltz's *Theory of International Relations* in 1979 identified the behaviors of states which are strictly linked to the distribution of power in the international system, and it generates an uncontrollable power competition between states (Glaser, 2010). The application of the Waltz's ideas on the international system can be seen in different frameworks of strategic competitions between states located in different regions, where South Asian is not an exception. The strategic competition between New Delhi and Islamabad is directly linked to presence of China in the South Asian regional politics. Indian

response to Chinese increasing influential position in the international world politics shapes a strategic competition between New Delhi and Beijing. Analogous to its confrontational interaction with neighboring China, the Indian strategic community has developed various points of disagreements with Pakistan. The cooperative bilateralism between China and Pakistan is another factor inflicting a sense of insecurity in New Delhi's strategic calculations. This scenario effects the Asian balance of power which is directly linked to the South Asian regional power politics in the presence of New Delhi-Islamabad rivalry. This connection of the South Asian regional politics and international power politics has been studied by various scholars such as Rajesh Rajagopalan in *Neorealist Theory and the India-Pakistan Conflict* (Rajagopalan, 1998). A study of Stimson Center also traced the genesis of China-India-Pakistan while calling this triangular strategic interaction rooted in territorial disagreements of India with its neighboring states with nuclear capabilities.

This complex security competition originates from the conflicted borders of India-China (Line of Actual Control-LAC) and India-Pakistan (Line of Control-LoC). The clashes on both borders have been resulted in the escalations of certain conventional armed conflicts of India with neighboring China and Pakistan. The New Delhi-based strategic community has translated the cooperative Beijing-Islamabad ties a potential threat to New Delhi in its home region. (Tourangbam, 2020). The Carnegie India acknowledged in a report the presence of India-China conflict in the broader Asian balance of power where Beijing's hostility with New Delhi and Beijing's growing cooperative connections with Islamabad disturb the Indian geostrategic calculations. The report published by Carnegie India *India's Strategic Choices: China and the Balance of Power in Asia* proclaims China's rise a serious threat to India on multiple fronts. Beijing's multilayered economic relations with Islamabad further augments the New Delhi's security apprehensions concerning Beijing's emerging role in the South Asian region (Rajagopalan, 2017).

Pakistani intellectual communities have also explored the Waltzian description of realism concerning the structural changes of South Asian regional politics and its impacts on Pakistan which has pushed Islamabad towards Beijing. In the debates on the Pakistan's position in the South Asian conflicted region, Mirwais Kasi *Pakistan-China Relations under the Shadows of Neo-Realism* maintains that the economic cooperation between Beijing and Islamabad is a response to the anarchical regional structure of South Asia (Kasi, 2016). Further debates on the structural features of South Asian regional security environment highlighted the dependence of South Asian regional politics on the international great power politics where China is a potential competitor of US, and the leaders of both great powers have developed their contesting position in the Asian political order as the external actors. This interconnectedness between South Asian regional politics and the international politics of great powers have been examined by several authors. A recent study of Felix Heiduk examined the power competition

between US and China in the broader Asian balance of power where Indian role cannot be marginalized because India is the primary force in determining the power dynamics of South Asian nuclearized region (Heiduk, 2022). There are a number of studies carried out by various authors on the transformation of US-China competition in the AI domain and its impacts on their South Asian allies. The South Asian version of US-China strategic competition in the AI-domain has placed New Delhi and Islamabad under an intense regional security environment in which the governments of states are going towards a regional level AI-arms race.

In other words, the structure changes in the international great power politics shape the India-Pakistan rivalry while pushing both South Asian contestants towards two opposing global powers. In the words of Russell Ong, China's pursuit for becoming an influential player in the world is a reaction to the US strategic engagement across the globe which is directly linked with the Indian standing in the Asian politics (Ong, 2012). In reaction, Chinese defense preparedness is attached to evolving global power politics which disturbs Indian strategic calculations, due to the conflicting Sino-Indian relations. Indian rising anxieties on Chinese growing advanced weapon systems has compelled New Delhi to take appropriate countermeasure in the domain of security and defense (Shanker at. al, 2018). This structure of power politics between US-China, and its impacts on India, has compelled the Indian defense planners to sign a broader framework of strategic engagement with the United States. This structure of power politics forces Pakistan to take appropriate defensive measures against Indian response of Chinese military modernization. Therefore, it is more appropriate to maintain that the evolving scenarios of AI-specific arms race in the nuclearized subcontinent is the outcome of the structural changes of the international system which insecure the positions of India and Pakistan in the South Asian region.

New Delhi's Internationalized Vision of AI

For the improvement of its conventional war-fighting capabilities, Indian government has established various bilateral strategic connections with different states. The focus of New Delhi is on the formulation of strategic collaborations with economically developed and technologically advanced nations across the globe. While developing strategic partnerships with the states of different regions, the security architectures of the Indian government always preferred to secure collaborative connections with the state with modern defense industries. The debate on New Delhi's increasing strategic cooperation with the outside world has witnessed a persistently increasing wave of Indian bilateral collaborations with other states in the domain of AI technology. Analogous to various other leaders, Prime Minister Modi has categorically mentioned on various occasions the need for making India a hub of AI technology. At the inaugural virtual session of the

RAISE 2020 (Responsible AI for Social Empowerment 2020), a formal address of Modi communicated to the international community New Delhi's vision of taking revolutionary multidimensional measures for expanding digital culture across the country with the objective of addressing the critical challenges in different domains (McDuie-Ra & Gulson, 2020). This statement sent a message to the world that the Modi's intentions for making India a center of the global digital market envisioned that the IT industries from around the world could let New Delhi actively engage in the global prevailing modern trends of information communication technology. For the internationalization of the indigenous IT industry, government officials from New Delhi have chalked out a comprehensive plan establishing foreign commercial contacts around the world under the government and semi-government investment partnerships. Under this objective, the Department of Science and & Technology (DST) recently signed an agreement with Sweden. An agreement for exploring AI technology and its various applications in mainstream state affairs with Sweden is a landmark development enhancing Indian significance in the European markets. Both countries are arranging various summits level meetings for the enhancement of their collaboration in the innovative technologies such as automated machine learning (Dennehy et al., 2021).

In the continuation of Modi's mission of securing greater extents of emerging warfare technologies, New Delhi has added the AI-technology in the broader framework of Indo-US strategic partnership which was formally started from the signing of Next Step in Strategic Partnership (NSSP) in 2004. In March 2021, the two-sided state representatives signed the US-India Artificial Intelligence (USIAI) under the auspices of the Indo-US Science and Technology Forum (IUSSTF). The IUSSTF was signed in March 2000 between the DST and the American State Department with the objective of empowering the Indian IT industry with advanced machine learning skills (Tuychiyeva & Horticulture, 2022). Along with US, Canada has emerged as a close partner of India for upgrading New Delhi's digital capacities, equivalent to improving its robotics and automated machine learning. The formal state officials of both states signed an Agreement for Scientific and Technological Cooperation in 2005, and a recently held 7th meeting of the India-Canada Joint Science and Technology Cooperation Committee (JSTCC) finalized the strategic directions of this agreement.

The AI-specific strategic aspirations of New Delhi have attached the Indian scientific communities to the emerging global trends of future technologies (Sekhar, 2005). The significance of a technology-oriented strategic partnership between New Delhi and Singapore is another case in which it could be believed that the transformation of geopolitical into the world of digital realities has attached India to different nations with advanced AI capabilities (Lands & Pasha, 2021). Parallel to the US, the AI-specific digital growth of New Delhi has built bilateral relationships with the Russian and Chinese governments beyond their formal disagreements on various strategic points of great power politics. The

fascination of great powers' technological developments has led further New Delhi towards the United Kingdom and discovered different dimensions of their bilateral cooperation with the British government in the domain of modern technology. An economic agreement has been signed between the governments of both states with an exclusive focus on AI technology. The British government has recognized India as a close strategic partner in the AI field along with Japan and Singapore in the Indo-Pacific region(Ryan, Al-Rubaye, & Braithwaite, 2022). Moreover, the commercial interests of New Delhi have convinced Indian leaders on the significance of energy-rich Muslim world in the contemporary international system, where the United Arab Emirates (UAE) became India's key IT partner with the signing of several Memorandum of Understandings (MoUs)(Sharma, Yadav, & Chopra, 2020). The recent India-Germany Inter-Governmental Consultations meeting, held on May 2, 2022, highlighted the existing progress and future plans of both states for bilateral cooperation in various domains, including AI (Xavier, 2020).

The exclusive focus on the multidimensional techno-cooperation between Germany and India has explored various multilateral platforms such as the India-EU Trade and Technology Council, Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), and G20. It is pertinent to mention here that India's presidency of G20 in 2023 will let New Delhi explore further opportunities for aligning its domestic IT industry with the members of G20 (Xavier, 2020). The Indian government has identified the objective securing memberships in different multistate initiatives of the international community while considering them the potentially supportive area in the contemporary world of emerging digital realities. To achieve this objective, the Indian Ministry of External Affairs (MEA) established a New, Emerging, and Strategic Technologies (NEST) division with a special focus on addressing the challenges to indigenous AI and 5G technologies (De Mello, 1999). The central idea behind the creation of NEST was to create interconnectedness between the Indian domestic IT industry and the advanced digital infrastructures of different states. In this way, Indian engagement with advanced nations under the umbrella of Shanghai Cooperation Organization (SCO), Brazil, Russia, India, China, and South Africa (BRICS), G-77, G-15, and different other multistate forums provide sufficient opportunities to New Delhi for achieving the desired levels of progress in AI-technology.

Indian Automated Weapon Capabilities

The foreign relations of India are constantly spreading New Delhi's diplomatic connections across the globe through various diplomatic and commercial activities at the bilateral and multilateral levels. The combination of diplomatic and commercial activities mainly supports the growing Indian strategic partnerships with technologically advanced nations. The role of DROD cannot be ignored in the

increasing network of Indian foreign relations across the world due active role of its Directorate of International Cooperation (DIC). Under the supervision of DRDO, the DIC aims to arrange different activities for international cooperation while identifying the significance of the global culture of research and development in information technology (Sandholtz, 1992). With the help of DRDO, the Indian defense industry has developed three types of AI-specific weapon systems to support its war-fighting capabilities of land, aerial and naval forces. Indian national celebrations such as Republic Day and DefExpo annually display the procurement of modern warfare technologies against traditional security threats. During such celebrations, the formal statements of leading government authorities appreciate the progress of the domestic IT industry and its association with DRDO, which has provided different AWS to the Indian Armed forces.

Besides estimating the contemporary level of hi-tech unmanned weapon systems, DRDO continuously updates the status of its AI-specific achievement with specific details on different online sources. A glimpse of existing unmanned armed devices of the Indian Armed Forces consist of NETRA, Nishat, Lakshya (UAVs), Muntra-B, Muntra-M, Muntra-N, Muntra-S (UGVs), Daksh, Daksh-Mini, Daksh- Scout (Robotics), and various micro and mini UAVs. With the cooperation of foreign suppliers, the national-level progress of Indian defense production has explored various other hi-tech armed capabilities such as Unmanned Small Airship Systems (USAS) and Unexploded Ordnance Handling Robots (UXOR)(Cowan & Foray, 1995). The UGVs prepared by Combat Vehicles Research & Development Establishment (CVRDE) based on Armament Combat Engineering Systems (ACE) is capable of transmitting encrypted digital information supported by several anti-jamming features (Cowan & Foray, 1995) whereas the NETRA is an Airborne Surveillance System known as the Indian Active Electronically Scanned Array (AESA) radar system(Kurinji & Ganguly).

In the debate on drones, Indian efforts have a brief history of developing and importing drone technologies to enhance the battle-combating skills of its armed forces. Domestic drone production is mainly based on government funding or in the form of public-private partnerships. In November 2021, the DRDO's prepared drone (Rustom) was displayed by the Indian army, and this experiment was based on satellite navigation systems (Rajagopalan & Krishna, 2019). Rustom was the first Indian Remotely Piloted Aircraft System (RPAS) with the fast functioning of Automatic Take-off & Landing (ATOL) and highly sensitive Synthetic Aperture Radar (SAR). Akin to Rustom, Ghatak is an indigenously produced Stealthy Unmanned Combat Air Vehicle (UCAV) with the specific capabilities of carrying missiles (precision-guided) and small bombs. In the maritime domain, the Indian security establishment has started thinking about producing and acquiring Naval Unmanned Aerial Systems (NUAS). The naval authorities of India appreciated the advanced functions of NUAS, consisting of different types of surveillance activities such as signals intelligence, target acquisition, and Automatic

Identification Systems (AIS) (Scholik, 2016). Indian Navy (IN) has already started operating UAVs (Heron*)* for navigational purposes, which are manufactured by Israel Aerospace Industries (IAI). In particular, the development of UUVs is a serious challenge for the Indian defense industry due to its inadequate capacities in the Underwater Domain Awareness (UDA). Indian naval officials have categorically mentioned at various occasions their strategic calculations while having an exclusive focus on the AWS in the maritime domain. Indian Chief of Naval Staff, Admiral Karambir Singh, stated in July 2021 that the IN has an approved "unmanned road map" with the main emphasis on the exploration of potential platforms for the sophistication of multileveled unmanned technologies (Bandyopadhyay, 2005). In addition to the navy, the adaptation of modern technologies in space has been recognized as a real challenge for Indian strategists. The space domain has witnessed the initial experiments of the Unmanned Model Space Shuttle (a mini space shuttle). These experiments have been carried out by the Indian Space Research Organization (ISRO) (Thyagarajan, Gupta, Goel, & Jayaraman, 2005). The development of these weapon systems has enhanced the operational capabilities of the Indian Armed Forces, and the impacts of these sophisticated weapon systems on the South Asian regional security environment cannot be ignored. The induction of different unmanned or automated armed devices in New Delhi's central defense planning contains serious implications for the Indian strategic competition with the territorially adjoining nations(Obama, 2010).

South Asian AI-Arms Race

In response to Indian increasing reliance on AI technology, the government of Pakistan has started paying sufficient attention to the promotion of advanced IT culture across the country. The government authorities from Islamabad emphasized the significance of AI technology in the formal statements on different occasions. The President of Pakistan, Arif Alvi, urged the nation to take substantial measures in the AI field, along with the Quantum Computing, Data Analysis, Cyber Security and Space technology. A formal position of President Alvi highlighted the role of Higher Education Institutions (HEI) in improving the digital capacities of the nation with the help of multileveled digital initiatives. The government authorities are determined to enhance the scope of Public Private Partnerships (PPPs) for integrating the role of advanced technologies with the core values of national security. The involvement of HEI has been considered essential by the government authorities for advancing IT culture in the society with the vision of producing digitally skilled future generations of the country. The government of Pakistan is designing various bilateral and multilateral frameworks of collaboration with other nations to support the domestic IT industry of the

country. All these efforts of Pakistan are a response to Indian massive investment in the AI-specific defense industry.

New Delhi's quest for becoming a regionally hegemonic and globally influential player has convinced Islamabad on the adaptation of new warfare technologies(Tripsas & Gavetti, 2017). New Delhi's mission of placing India at the center of the global technological race is directly linked to the strategic outlook of its home region, where an arms race in the nuclear domain has already intensified the regional security environment. The effective engagement of New Delhi's formal strategic community with the mainstream Indian political authorities has forced the Indian government to start working on the formulation of the National Strategy for Artificial Intelligence (#AIFORALL). A published Discussion Paper on the #AIFORALL compared the level of technological advancement in India with the progress of developed states in the AI domain (McDuie-Ra & Gulson, 2020). This research report presented an overview of Indian efforts for developing a digital society, parallel to learning the experiences of technologically improved nations (US, Germany, China, UK, and France) in the AI sector. Establishing foreign connections through various bilateral and multilateral collaborations has become a prime factor in revolutionizing New Delhi's defense production. Based on the efforts to achieve the high extents of sophisticated modern technologies, New Delhi's security establishment has started improving its strategic muscles in the territorial and maritime domains of the nuclearized subcontinent. Indian leading security architectures have perceived the politics of its regional and extra-regional affairs as a serious threat to its strategic ambitions for maintaining a hegemonic status in its domestic region, parallel to securing an influential position in global world politics. The combination of perceived threats in both domains shapes the strategic outlook of India in regional and international politics and allows Indian government officials to introduce and adopt various technological trends for the advancement of Indian conventional armed forces. Pakistan from the South Asian region and China from the broader Asian power balance have been recognized as serious threats to India, according to Indian official sources. The emerging Sino-Pak nexus has become the central theme of New Delhi's contemporary defense planning, in which an effective role of Indian armed forces, equipped with different automated weapon systems, could serve the strategic interests of India. The Chinese weapon modernization under the umbrella of AI has been confirmed by various American reports such as a recent report of Congressional Research Services *Artificial Intelligence and National Security*. The report highlighted the growing reliance of China on the AI technology has convinced Beijing to allocate sufficient financial resources to the acquisition of modern warfare technologies. Thus, the pursuit of averting the threats of two neighboring nuclear powers defined New Delhi's path for obtaining modern technologies against its territorially adjoining states.

The employment of various automated weapon systems is resulted in the New Delhi's increasing engagement in the international trade of advanced weapon

systems. The commercial connections of the Indian government with the mainstream weapon industries of the world under the broader framework of its strategic partnerships facilitate India in empowering its regional and global standings. In the list of New Delhi's increasing cooperative collaborations with the states with technologically advanced defense productions, Israel has emerged as India's main supplier of sophisticated weapons systems. The four main companies of Israeli MIC have started developing bilateral collaborative ties with Indian defense industry. Apart from Israel, various other states have viewed India as a potential actor in the international defense trade. Based on these developments, it can easily be maintained that the Indian quest for modernizing its regular armed forces has disturbed the regional security environment of South Asia, where Pakistan is determined to counterbalance India in its domestic home region. Islamabad's reaction to New Delhi's progress in advanced warfare technologies has inaugurated an AI-specific arms race in the nuclearized subcontinent which will lead regional politics of South Asia toward technological warfare. The leading figures of intellectual communities from across the globe have started translating the emerging scenarios of AI-specific India-Pakistan competition in different nonconventional wars such as "Hyper War", a type of conflict with less human involvement and more automated with advanced weapon systems (Husain, 2021). Such wars will be based on potentially automated conflicts between states in future, and the idea of hyperwar has partially been practiced in the world in the form of drones. The concept of hyperwar generally refers to the war of machines consisting of various automated devices mainly supported by advanced weapon technology under a machine-waged conflict (Husain, 2017).

Conclusion

The presence of nuclear weapons in any region cannot diminish the role of conventional forces in the mainstream defense planning of states. The structural changes of international system, defined by neorealist, determine the states behaviors, and compels the leaders of the states to always remained consistent with the developments of their advanced weapon systems. The reflection of realist-driven ambitions of the states for developing advanced weapon systems can be seen in the strategic priorities of the states which has integrated the AI-supported weapon systems with the regular security and defense affairs of the states, as mentioned in a co-authored study of Center for International Governance Innovation *The Impact of Artificial Intelligence on Military Defence and Security*. The geostrategic calculations of the states, driven by neorealist thoughts, has placed the whole international system under the shadows of modern warfare technologies and altered the conventional outlook of global world politics. An academic account of Maurizio Tinnirello has mentioned this aspect of international politics by highlighted the peaceful and non-peaceful dimensions of AI technology

(Tinnirello, 2022). The governments of all states always remained cautious about the moves of others in the anarchical structure of international system, parallel to emphasizing the acquisition of active defense systems. In this academic debate, the South Asian region can be considered an accurate example where India and Pakistan are trying to keep their regular armed forces technologically well-prepared and well-planned against each other. The strategic communities of both states have accepted the role of AI technology in improving the operational capabilities of their regular armed forces. The acquisition of the modern weapon system in the South Asian nuclearized subcontinent has facilitated the forces of both nuclear weapon states. It has enabled their leading defense planners to upgrade their existing border management mechanism with the help of advanced weapon system. Thus, the involvement of AI-specific weapon systems in the South Asian regional security environment is intended to disturb the traditional strategic outlook of nuclearized subcontinent where the pair of nuclear weapons states has been involved in an intense strategic competition. The Indian Land Warfare Doctrine 2018 and Pakistan's National Security Policy 2022-2026 have formally communicated to the international community the strategic ambitions of India and Pakistan for modernizing their conventional patterns of defensive capabilities. The legislative circles of both states have prepared various digital plans and released declassified versions of different documents containing the vision and efforts of both nuclear powers in the AI domain. The leaders of both nuclear powers are persistently increasing their reliance on AI-technology while having a less reluctant approach toward attaining different unmanned military devices with the modern warfare technologies.

Under the broader framework of AWS, the strategic communities of India and Pakistan are strong-minded in achieving various technological milestones in the fields of security and defense. In *Emerging Trends of Artificial Intelligence South Asia and its Implications for Pakistan*, Shaza Arif has unfolded the India-Pakistan hostility in the age of AI technologies in which New Delhi is designing several state-level initiatives for the attainment of modern warfare technologies (Arif, 2019). These initiatives are fundamentally planned to provide effective border management systems to the regular armed forces of India and Pakistan while enhancing the operational abilities of their regular armed forces. The comparative analysis of the India-Pakistan AI-specific weapon capabilities revealed that the proactive defense planning of New Delhi is determined to introduce a highly sophisticated unmanned weapon system in its existing defense system, which has worse impacts on Pakistan's security. While inflicting a sense of insecurity in Islamabad's strategic mindset, New Delhi's pursuit of pushing Pakistan at a disadvantageous position in its home region has compelled the government of Pakistan to counterbalance India in the AI domain. Beyond the growing appreciation of AI in the international system, the strategic community of Pakistan is purely concerned with the Indian capacities for procuring hi-tech war-fighting capabilities. Therefore, it is more appropriate to maintain that the India-Pakistan

competition of defense technologies has inaugurated an AI-specific arms race under the nuclear shadows while intensifying an asymmetrical strategic balance between New Delhi and Islamabad in the domain of modern warfare technologies. Parallel to the weapons modernizing trends of great power politics, New Delhi and Islamabad are intended to adopt various sophisticated weapon systems against each other, which will further complicate the security of the entire South Asian region. In this way, the South Asian regional security environment has started witnessing the initial phase of an AI-specific arms race between both contesting nuclear powers of South Asia which need the serious attentions of the leading strategic circles of different states. The serious attentions of the great powers or the states having multileveled strategic partnerships with India are required in this regard to avert the prevailing scenarios of AI-specific arms race between New Delhi and Islamabad.

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