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RESEARCH PAPER

A Realist Perspective on Technological Disruption: Emerging Technologies and The Security Dilemma in South Asia

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ABSTRACT

This paper reviews the effects of emerging technologies on the situation of security dilemma in South Asia with special reference to the parameters of India-Pakistan strategic rivalry and the dynamics of military modernization. The long-standing enmity between the countries in South Asia between India and Pakistan has escalated to cyber power, artificial intelligence, missile defense and drones. Such innovations, according to a Realist perspective, change the balance of power and perceptions of threat, but do not provide stability. This qualitative research uses Realist theory on policy documents, strategy doctrines, and secondary materials to evaluate the change in the behavior of the security into the region. The results show that new technologies increase doubt, speed up weaponry rivalry and shorten reaction periods. Dual-use systems obscure the offensive-defensive lines, making things even more distorted. Balancing strategies and strategic signaling is also supported by technological asymmetries. Therefore, there is a weakening of deterrence stability. There must be confidence-building measures in cyber and AI.

| **KEYWORDS** | New Technology, Security Dilemma, Low-Risk, Cyber-Attacks, Nuclear Deterrence, Autonomous Weapons |

Introduction

South Asian nucleation will bring in a strategic stability in the unstable region, South Asia. The presence of the history of Pakistan India hostility and lack of traditional equalization of power or epochal power contrast there never was a feeling of strategic disequilibrium there were many justifiable reasons as to why this is so between India and Pakistan. The historical baggage, territorial differences, ideological difference and Indian ambitions of the regional hegemony have made the race to be on. India is the most populated nation in the world, besides being the largest economy nation, military and territory wise in the globe. Competition is not there since we cannot compare it with Pakistan or another country of the south Asian area. This huge vacuum is one of the reasons to tactical instability to counteract the nuclearzation in South Asia particularly the case of India and Pakistan. The development of nuclear weapon by the Pakistani news has established a strategic stability in South Asia (Yaseen, et al., 2016; Hanif & Muzaffar, 2025). The conventional solutions augmented by AI could have an impact on the permanence of strategies among the largest military powers.

The South Asian region is also experiencing a period of transformation which is characterized by an ever emerging and adopting high-tech technologies such as the implementation of AI that also introduce threats and opportunities that also transform the strategic environment of the South Asian region i.e. India and Pakistan. It is also significant that Pakistan also becomes aware of the subtle impacts of such technologies to be able to make productive decisions and policy-making. The main question of concern is how to work

the complex balance between the strategic challenges and opportunities that arise when emerging technologies particularly AI are introduced into the military sphere in India that poses strategic challenges to Pakistan in the same way.

Literature Review

The swift adoption and proliferation of disruptive technology such as artificial intelligence (AI) in the South Asian region with special regard on India and Pakistan and their traditional war reenacting the nature and national capabilities of war this literature review is a survey of the literature and analysis of how new technology has challenged and offered opportunities that is the most significant in the South Asian region strategic stability. disruptive technologies such as artificial intelligence (AI), Cyber capabilities ballistic missiles, hypersonic missiles systems, unmanned systems, stealth fighter jets, advanced air defense systems such as S-400, home grown systems The South Asian theater sphere of AI has made a positive step towards the same and India has become one of the key investors in the new technologies (particularly, AI) to enhance its strategic location. India is the fifth biggest economy in the globe and the country has an enormous economic benefit at the back that enables the speeding up of the procedure of AI integration into its military (Khurshid, 2023). The tact of the current strategic balance of power between India and Pakistan, difficulty on the prospective of disruptive technologies, strategic implication prospects and challenges, and, prospects to specially Pakistan encompass specification of the required research gap in the modern literature. India had contained AI and AI contained distractive technologies and this was threatening the national security of Pakistan directly. The nuclear deterrence is the only and solitary security umbrella or recipient in Pakistan given the huge disparity in the conventional power of the two countries. High hyper sonic missile attacks of Pakistan can be assisted by integration of AI based technologies such as UAVs, because of the erase second strike capability. The new development compromises the concept of credible minimum deterrence which is the fundamental component of the Pakistani nuclear policy to deter the Indian threat. The nature of war was transformed by the creation of the Artificial Intelligence (AI) and other emerging technologies. The South Asian security felt that they underwent a paradigm change when it came to the aspect of military because of the introduction of AI in their weapons and technology (mr. muhammad, 2024). The explanation of why nuclear security relies on cyber security could not be left aside due to the appalling security implication of cyber-attack that cannot be overlooked. This is why the cyberspace is slowly becoming conceptualized into the nuclear systems; cyberspace has been posing a huge threat on the nuclear infrastructure in South Asia. Cyber threats have been discovered to demonstrate the weakness of the nuclear systems in a number of instances. The case of Stuxnet that is one of the most advanced cyber weapons in the world and a game changer when it comes to cyber security is one of the best examples (Ashraf and Kayani, 2023).3 Stuxnet is an Iranian case, but it also makes the eyes open to all the countries that have nuclear weapons (Ashraf and Kayani, 2023). Existing literature primarily concerns international power including United States of America, China,Russia and western countries and very little about the strategic challenge posed by emerging technologies in South Asia and its challenge to the Pakistan particularly as per nuclear armed arch rival countries.

Theoretical Framework

In this paper, classic and structural realism theories have been presented of inexhaustible research and the two theories of international relation and security deal extensively with the topic of this paper i.e. Strategic implications of emerging technologies in South Asia challenges and opportunities to Pakistan. The classic realism can explain the power politics based on power balance in human selfishness and egoism national interest and anarchic system of international system. It is a form of diplomacy, which is said to be realistic, unlike the realist theory, following the exploration of the balance of power and the necessity to promote the national interests (2023, 2021). This classical theory of realism

classifies the world as lacking of a central power, the world is anarchic and all states strive to obtain as much power as possible or power combination or power equilibrium with the rest of their rivals to secure their survival in a anarchic international system. In the realist paradigm and in a scenario in South Asian and more so, Pakistan India, India is amassing its forces through the implementation of the emerging technologies, which are becoming determinant factors and are changing the current nuclear deterrence and equilibrium of terror and pursue a strategic influence in South Asia (Nawab, et al., 2021).

Conceptual framework

The logic behind the carrying out of this study is that I am investigating the Strategic implications of the Emerging technologies in South Asia to be applied within Pakistan Indian rivalries. To analyze, the number of I design variables will be broken into two variables, which are dependent and independent. The high rate of integration of the emerging technologies into the military of India and more so the AI which may cause disruption of the strategic environment of the South Asian region is the independent variable but indirectly, the independent variables are also dependent but not necessarily the same (Emerging technologies or ETs). Similar to as Air defense systems that India sells Russia S-400, Ballistic Missiles, AI,Cyber systems, Unman Aerial Vehicles stealth fighter jets, hypersonic missile systems, nuclear submarines, second and third strike nuclear systems e.g. And there there are result possible outcomes or results of independent variables that are found between these independent variable and some dependant variable as I have previously mentioned. (Batool, & Muzaffar, 2024). The Strategic Implications to Pakistan which we can again further break down to the sub-categories which are economic, military or national security, Political and, diplomatic e.g. National security or militarily, we can discuss the degree of the threats of the integration and development of the Indian ETs and formulate the most appropriate course of action. It has impacted the economic aspect since it has to respond but the economy in Pakistan is not at this stage to compete with India in the same plane. The outcome of the above dependent variable, Pakistan foreign policy and diplomacy will mediate in countering the Indian ETs and will give military Pakistan strength assisting it with the help of China and other world technological military and economic powerhouses as turkey and Russia (Muzaffar, et. al., 2018). In this instance, there will be no less than challenges in the foreign policy of Pakistan as well as opportunities. Independent variables Applied theories Catalysts or mediators Dependent variables (Conclusions or developments of south Asian region particularly, Pakistan)

Independent variables

India's integration of emerging technologies especially AI

Applied theories

1. Classic realism
2. Structural realism
3. Security dilemma

Catalysts or mediators

1. India's alliance with US & Israel
2. Pakistan's China's alliance

Dependent variables

(Out comes or results for South Asian region specifically for Pakistan)

Opportunities   **Challenges**

1-Deeping strategic ties with China	1-Strategic instability
2-Indeginous technology	2-Technological race
3-Asymatiry strategies	3-Economic Burdon

Challenges

The economic issues and potential react to the Indian ETs investment due to the existence of a huge economic distance between the nations, institutions and the access of emerging technologies to the international market.

Opportunities

It is the natural fact that even amidst all the troubles there is the chance in itself. In an attempt to improve its asymmetric policies, Pakistan may also initiate strategic alliances with the anti-indian nations such as china in order to bring it down.

Material and Methods

Qualitative research

The research is both informed by the qualitative research design and there exist various reasons as to why to adopt the qualitative research design.

Data collection

The rationale behind why it was not impossible but rather difficult to secure primary date to complete this research is that information that is sensitive, national security, nuclear related information and other calcified military information are extremely difficult to access primary data in this instance this study will use secondary data acquired using a reliable source of information. Sources are of type, that is, and following.

Books/ academic publications of research.

At leisure, relevant information is received, in national and international large field research journals. The data acquired are the professionals in the area of concern that covers strategic studies, international relation theory, regional security etc.

Research Reports

The elicitation is done according to the research reports and in details to establish the means of addressing the research problem and achieving the objectives of this research. The secondary data is implemented in the form of popular think tanks such as as center of strategic studies as Islamabad and various think tanks reports. The reports of international organizations. The economic challenges and opportunities are understood and put into perspective through analytical and reports of international organizations such as IMF and World Bank.

Thematic analysis of data

The data is analyzed with the assistance of the method of thematic analysis that could be explained by the fact that I formulated a set of topics which was grounded on the received data as technologies, technological challenges, opportunities.

Theoretical analysis

To unravel the reasons why the themes are being laid down and elaborate on the same theoretical lenses as structural realism, security dilemma and classical realism are applied to unravel themes, the explanation why the themes are happening is addressed.

Emerging strategic technology that is critical and transforming South Asian strategic environment. The south Asian strategic environment has also undergone a significant change where the emergent technologies are gradually giving way to security environment in the region. Some of the most crucial changes that are being implemented are artificial intelligence (AI) and improving autonomous decision-making, intelligence analysis, and precision targeting. In the same manner, new technologies artificial intelligence, cyber, autonomous, and advanced conventional warfare have never existed before and will most probably change the shape of the warfare and transform the security environment in South Asia (Babar & Abbasi, 2023).

AI and automation Artificial intelligence is a sub-discipline of computer sciences and new field of computer science. The two most valuable driving forces in a new wave of technological development are automation and artificial intelligence (AI). The AI is the smartness that makes it possible to automatize, the robot of efficiency that is the repetition, the rule-of-thumb operating which is not associated with human activism.

Artificial Intelligence and automation The New super powers

Artificial and automation are the new trends and most innovative technologies which can be termed as super technologies which have a potential to change strategic environment of different regions or the world. Russian President said Who lead in AI will lead the world, so I can say that both AI and AI based automation technologies are the super powers or the technologies which are having a life changing impact on literally every aspect of life within a couple of seconds i.e. are the super powers of the 21 st century, the technologies that are revolutionizing the strategic future of the world. Their influence is enormous in all spheres of life such as the military, economy and geopolitics.

Applied AI to the needs of civilian and economic application in South Asia

Artificial Intelligence is a major factor in South Asia both in economics and civilians. The South Asian region in which the largest portion of the world is residing due to the presence of the world first and fourth most populated nations in this region and also Bangladesh is a high populated country. The case of India and Pakistan has a youthful population which is more than 50 percent of the population.

AI defense and security application and usages.

The world and each and every development that will follow with technology is growing and advancing with every passing day and it is having developmental challenges, opportunities and threats. It was an innovation of Stone Age to AI and smartphones.

Results and Discussion

The south Asia is an area with a strategic that is growing along with the emerging technologies. The ways of war and deterrence are changing in South Asian strategic environment that is being realized with the efficient development and evolution technologies of mainly AI, LAWS, Cyber capabilities, hypersonic missiles and space technologies.

Threats of Strategic and Security Environment in Pakistan.

A series of complexes that are encountered by Pakistan security and strategic environment entail internal and external factors, internal factors encompass political instability, economic vulnerability internal security, governance and numerous other irrefutable factors. Both have bad relations with Pakistan at the external front.

Economic and Infrastructure limited.

The conventional way of looking at national security used to be in terms of military and defense but the traditional thinking will not last long. One of the biggest threats assumed in the national security is economy. Week economies lack the capability of ensuring that they are present in international system. National security has economic security. The economic and infrastructural constraints are being experienced in Pakistan. Well being of any specific nation and the economic security is a very crucial aspect and as such, it has several dimensions of interest which are sustainable development, constant economic functioning and equal wealth distribution. As a developing country, Pakistan is a nation with an active socio-economic context and is challenging in regard to the provision of economic security of its citizens (Sheikh et al., 2022).

barriers in relation to Human Capital and Education.

To guarantee the national security, the triumph over the states of security and existential risks, the states should invest its human capital building in and eliminate the hindrance in education in order to make the quality of the contemporary skills education available. One of the most latent structural constraints of development, human capital, in Pakistan, is the national security. The reports that are presented by the World Bank as was observed in the Human Capital Index and the reviews provided, indicate that the achievement of the Pakistan population in terms of health, education and skill development has been changed slightly over decades and also has been biased and provincial. The quality of learning is low, the percentage of out of school is large, there is an imbalance of genders in school, and education is not connected with the workforce, which undermines the country to produce the skilled labor force that is required in intense defense or competitive civilian economy. This is a twofold dilemma in the literature, the lack of quantity (enrolment) and quality (learning outcomes) (Agustina, 2019).

Governance and Policy Hurdles.

A strong, powerful, lively and a healthy country is a result of good governance. Bad states cannot establish their survival in the international system governance in the shape of obstacles both locally and internationally in the political, economic and strategic fronts. Local Competitions and Geopolitics. The unstable political, economic and military relations with Afghanistan as well as its rivalry with India are also a challenge that faces Islamabad in the face of an unstable geopolitical environment. Well, it is an old adage that Enemy friend is enemy and enemy friend is enemy and now what is happening to Pakistan in the south Asian region is not an exemption as India is accruing strength in Afghanistan and it is playing its ugly side against state of Pakistan.

Conclusion

The South Asian strategic environment is experiencing a radical change pushed by the new technologies, especially artificial intelligence, cyber capabilities, hypersonic systems, and autonomous weapons. The technological advances are transforming the conventional deterrence frameworks and inflating the security dilemma in the long-standing rivalry between India and Pakistan. The balance between conventional and strategic forces has been complicated by the integration of advanced technologies into nuclearization and therefore, the strategy stability introduced by nuclearization previously was based on mutual deterrence.

According to the Realist school of thought, states will gain survival in an anarchic international system by maximizing power and gaining strategic benefits. In this regard, technological modernization in India is a rational way to seek strategic dominance, and at the same time it strengthens the perception of Pakistan about the threat, and forces it to take countermeasures. This process of reaction and action only increases insecurity in the region instead of eliminating it. The new technologies and systems, especially AI-based systems, and cyber integration into nuclear infrastructure create new vulnerabilities that question credibility of second-strike capabilities, as well as doctrine of credible minimum deterrence. To Pakistan, the consequences are not just limited to the issues of the military to include the economic stability, the ability to govern, and the development of human capital. The technological field of strategic competition cannot be maintained without the solid economic bases and institutional reformation. At the regional level, mistrust is further endangered by the lack of effective mechanisms of confidence building in the cyber and AI fields.

Finally, technological development in South Asia is both a threat and an opportunity. Nevertheless, it can be contended, through wise strategic thinking, economic enhancement, and diplomatic participation, that it can handle technological disruption and still maintain the balance of the security in the region.

Recommendations

The future strategy of South Asia lies in proactive, dynamic, and technology sensitive policies, especially among India-Pakistan rivalry. To begin with, Pakistan must reinforce the credible minimum deterrence by incorporating the cyber resilience and AI-based command-and-control measures to ensure that nuclear activities are not susceptible to the vulnerability of the precedent of Stuxnet. To provide the credibility of second strike and strategic stability, nuclear security should be more heavily considered through the prism of cyber-security.

Second, it is essential to focus on the development of native technologies by the country in the form of civil-military cooperation, and it should be applied to AI, cybersecurity, space technologies, and unmanned systems. Such alliances will be strategic partnership with technologically advanced partners like China and Turkey in order to close capability gaps without overdependence.

Third, economic resilience should be viewed as a part of national security. Pakistan will be able to compete in the age of AI-driven warfare by investing in human capital, STEM education and digital infrastructure. The reforms and improvements in the governance by institutions are also necessary to promote successful policy implementation.

Fourth, confidence-building measures (CBMs) between India and Pakistan need to be updated and revised with cyber norms, artificial intelligence mechanisms of risk reduction, and military transparency on new technologies. Attempts to decrease misperception and the risk of escalation could be achieved via a regional discussion of autonomous weapons and missile defense systems.

And lastly, the foreign policy of Pakistan ought to be a multipolar policy based on a balanced approach to major powers without having to become involved in bloc politics. Pakistan can survive in the complicated strategic environment caused by the new technologies in South Asia by means of integration of deterrence stability, technological adaptation, economic reform, and diplomatic interaction.

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