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AI in Defense: Governance Gaps and Strategic Pathways for Pakistan

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ABSTRACT
This paper explores the changing function of artificial intelligence (AI) in military governance, particularly exploring Pakistan's journey in global and regional longevity contexts. It not only examines global paradigms such as structured monitoring methods in the United States, swift military-civil integration in China, and confined centralization in Russia, but also illustrates comparative experiences from middle powers. Pakistan's institutional advances in UAV program development and AI research centers are evaluated against the persistent governance void, which encompasses the lack of AI doctrine within the military and ethical guidelines. The paper ends with proposed frameworks for responsible adoption that call for ethical frameworks, regional cooperation and strategically proactive governance. In doing so, this study situates Pakistan's experience within broader debates on strategic stability, arms races, and ethical regulation of emerging technologies. It highlights how insufficient governance risks fueling regional insecurity, especially in the context of Pakistan's rivalry with India. The paper argues that governance is as vital as technological advancement, stressing the urgent need for doctrinal clarity, civil–military integration, and alignment with international AI norms. Only by combining innovation with accountability can Pakistan ensure that military AI enhances national security while contributing positively to global stability.
Keywords: *Military Artificial Intelligence, Governance, Pakistan, Strategic Stability*

INTRODUCTION

Artificial Intelligence (AI) is quickly becoming a central part of modern warfare. Across the world, the great powers are developing institutions and doctrines to govern its application. Programs like Maven and the Chief Digital and Artificial Intelligence Office (CDAO) are examples of efforts in the United States to organize AI in military applications. China takes a different path, pushing AI through civil–military fusion and its idea of "intelligentized warfare." Russia follows yet another model, focusing on cyber and hybrid capabilities, but with far less transparency.

Pakistan is also taking AI forward in defense. The development of the Group 4+ drone, Shahpar-III UCAV for strike, ISR, and maritime roles, and Turkish-Pakistani loitering munitions YIHA-III to be deployed in 2025 also signals a shift towards AI-enabled aerial warfare.

Concurrently, Pakistan's National Artificial Intelligence Policy – 2025 seeks to create an AI ecosystem via six strategic pillars: innovation funding, public awareness, secure systems, infrastructure, sectoral transformation, and global engagement (Dilawar, 2025). However, it lacks defense-specific governance and ethical oversight, creating a civil–military disconnect that raises concerns about accountability and strategic coherence.

This paper examines Pakistan's military AI governance, identifies oversight gaps, and offers comparative insights from global and middle-power benchmarks to propose actionable pathways for responsible defense AI governance.

METHODOLOGY

This study adopts a qualitative, exploratory approach to investigate the governance of artificial intelligence in Pakistan's military sector. Since military programs are often classified, open-source research is the primary tool to analyze trends, policies, and institutional practices. The analysis draws on a wide range of secondary sources, including official government documents such as the National Artificial Intelligence Policy (2025), think tank outputs from institutions like CISS, ISSRA, and NDU, as well as policy briefs, academic publications, and reputable media reports between 2021 and 2025. These materials allow for triangulation and cross-verification of information to ensure reliability.

To strengthen the analytical depth, the research incorporates a comparative case study method by examining how selected middle powers, Turkey, Brazil, and South Africa, approach the integration and governance of military AI. These states were chosen due to their geopolitical relevance, emerging defense ecosystems, and active participation in international AI governance debates.

Additionally, a normative framework is applied to assess Pakistan's ethical and legal positioning, particularly in relation to lethal autonomous weapons systems (LAWS), civil–military policy alignment, and international commitments. This dual lens of comparative benchmarking and normative analysis provides the basis for identifying governance gaps and proposing policy recommendations tailored to Pakistan's strategic context.

Limitations

This research faces several limitations, primarily due to the classified nature of military AI programs. Much of Pakistan's defense-related AI development, including projects within intelligence, surveillance, and autonomous weapon systems, remains undisclosed. As a result, the study uses primarily open-source resources, including government policy documents, think tank reports, journal articles and trusted media coverage. In addition, although such sources offer important insights, they are unable to capture clandestine interventions and unrevealed strategic intentions.

The comparative nature throws up another limitation. The middle powers selected for this purpose: Turkey, Brazil, and South Africa, were selected as they are particularly active in AI governance debates and defence modernization endeavours. However, excluding other emerging players such as Saudi Arabia, Egypt, or Malaysia narrows the scope of comparative findings.

Despite these constraints, the analysis remains useful for identifying broad governance patterns, highlighting Pakistan's policy gaps, and outlining actionable pathways for strengthening military AI oversight.

LITERATURE REVIEW

At the global level, major powers are actively shaping military AI doctrines. In the United States, the Pentagon's Algorithmic Warfare Cross-Functional Team (Project Maven, 2017) was an early effort to fuse multisensor drone data with AI analytics. By 2020 the U.S. Department of Defense codified five ethical principles (Responsible, Equitable, Traceable, Reliable, Governable) governing military AI use. China similarly embeds AI at the center of strategy: its Military-Civil Fusion (MCF) policy channels civilian AI R&D into the PLA, enabling "intelligentized warfare," the operationalization of AI, big data, and autonomy in combat. China's 2019 defense white paper explicitly championed AI-driven modernization (Bitzinger, Evron, & Yang, 2021). Russia also prioritizes AI for future war; Russian doctrine speaks of "intellectualized warfare," emphasizing AI-enhanced ISR and decision aids (while

officially retaining humans in the loop) and even applying AI to cyber/information operations and nuclear command systems (Bendett, 2024).

Regionally, India has moved quickly to integrate AI into defense. In 2018 New Delhi set up an AI task force that spawned a Defence AI Council and a Defence AI Project Agency (with about $13.2M funding) for military AI applications. DRDO's AI labs (e.g. CAIR) are developing smart UAVs and electronic warfare tools. Notably, India has fielded over 140 "smart" AI-driven surveillance systems (radars, cameras, UAV feeds) along its borders with Pakistan and China (Mansoor, 2024). Scholars warn this pervasive AI-enabled ISR could destabilize South Asian deterrence: by improving target-finding and strike speed it may undermine crisis stability and tempt pre-emptive first strikes.

Pakistan's military AI landscape is only beginning to emerge. Pakistan has fielded domestic UAVs: the NESCOM-designed Burraq (Pakistan's first indigenous UCAV, operational since the mid-2010s) and GIDS's Shahpar medium-altitude UAV (introduced ~2012) provide ISR and strike capability (Hussain, 2025). These drones have been used for counterterrorism and surveillance missions. They complement imported systems (Bayraktar TB2, Chinese CH-4, etc.) to extend Pakistan's border surveillance.

Institutionally, Pakistan has announced new AI governance and R&D bodies. Its draft 2023 National AI Policy explicitly calls for "ethical and responsible" AI use with humans in the decision loop (Ghalib, 2025). The government has launched centers such as a National Command Centre with strategic C2 support, a National Centre for Cyber Security, and a National Centre of Artificial Intelligence (NCAI) to coordinate AI research. Civil-society efforts (e.g. the Presidential Initiative for AI and Computing, PIAIC, and Punjab's AI & Security initiative) aim to build AI talent and industry (Ali, 2023). However, existing Pakistani analyses largely note these programs in passing; detailed studies on how the military actually governs AI technologies are scarce.

Literature Gap

The literature extensively charts AI arms races and doctrinal trends among great powers and India, and catalogs Pakistan's drone acquisitions and high-level initiatives. However, little scholarship examines how Pakistan's military and government are actually governing AI integration. Existing work notes Pakistan's calls for "human-in-loop" controls and its draft AI policy, but does not assess implementation. Crucially, formal mechanisms for civil–military coordination, ethical oversight, and AI-specific doctrine in Pakistan remain understudied, leaving a gap at the intersection of technology, policy and governance.

MILITARY AI GOVERNANCE: GLOBAL TRENDS AND PAKISTAN'S POSITION

Global Military AI Governance

The global landscape of military AI governance reveals distinct models that major powers have developed to integrate AI into defense strategy, each exemplifying a different balance between technological innovation and governance.

United States

The U.S. has taken a structured approach by institutionalizing AI governance within its military. The Chief Digital and Artificial Intelligence Office (CDAO) centralizes AI efforts across departments, embedding policy with oversight mechanisms. A notable initiative, Project Maven, uses machine learning to analyze drone-collected data and support targeting decisions, important because weaponization remains activated through human confirmation (Mohsin, 2024). Complementing such programs are the Pentagon's AI Ethical Principles adopted in 2020, emphasizing human accountability, reliability, and traceability in AI applications.

China

China follows a contrasting model, blending military and civilian technological capabilities through its Military-Civil Fusion (MCF) strategy. This institutional doctrine, coordinated by the Central Integrated Military and Civilian Development Commission led by Xi Jinping, facilitates a seamless exchange of innovation between civilian industries and the PLA. Its "intelligentized warfare" doctrine exemplifies this fusion, embedding AI into autonomous systems, battlefield command, ISR, and electronic warfare (Pomerleau, 2020). While this model accelerates military modernization, the absence of transparent ethical safeguards raises concerns about unchecked deployment.

Russia

Russia adopts a more opaque and centralized approach. It actively deploys AI-enhanced systems for surveillance, swarm drones (like the Lantset kamikaze drone), and integrated command networks across air, land, cyber, and space domains. These systems are managed under tight state secrecy rather than formal governance frameworks. The Russian military's continued investment in AI, including expanding research, training, and infrastructure, underscores strategic priority, but with limited ethical or institutional oversight (Solovian, 2025).

Pakistan's Institutional Landscape & Strategic Integration

Pakistan has reinforced its defense-integration of AI and advanced technologies through the formation and activation of key institutions. Notably, the National Centre for Artificial Intelligence (NCAI) at NUST was established to spearhead AI research, innovation, and capacity building across civil and military sectors. In addition, the President's Initiative for Artificial Intelligence and Computing (PIAIC) supports multi-disciplinary AI programs to nurture AI talent ecosystems. On the counterterrorism front, the recently inaugurated National Intelligence Fusion and Threat Assessment Centre (NIFTAC), under NACTA, provides centralized intelligence coordination and threat assessment across multiple agencies and provinces.

In the aviation and tactical domain, Pakistan's unmanned aerial capabilities reflect progress in indigenous defense technologies. The Burraq UCAV, developed by NESCOM and deployed by the Pakistan Air Force and Army since 2013, marked Pakistan's first domestically produced armed drone in active combat (Dawn, 2015). Its successor, the Shahpar-III, a Group-4+ MALE UCAV developed by NESCOM and GIDS, was unveiled in November 2024. It features dual-redundant avionics, long endurance, multi-role ISR/strike versatility, and domestically built AI-enabled sensors and control systems. Furthermore, earlier variants such as Shahpar-II showcased targeting proficiency using the Burq missile from high altitudes (Defence Security Asia, 2024).

Pakistan has also deepened defense partnerships through strategic collaborations. During the May 2025 conflict, India's Army Deputy Chief disclosed that China supplied live battlefield intelligence to Pakistan, while Turkey provided Bayraktar drones and trained personnel (Dayal, 2025). Bilateral defense ties are further institutionalized via trilateral frameworks, including Turkey–Pakistan–Saudi Arabia R&D collaboration, and high-level visits aimed at strengthening defense-industrial linkages.

Despite these advancements, glaring challenges persist. Pakistan lacks a formal defense-specific AI doctrine or cohesive governance framework guiding military AI deployment. This institutional and doctrinal gap underpins broader issues like underfunding, talent shortages, and a civil–military disconnect,

especially noticeable in the 2025 National AI Policy, which largely omits defense and ethical oversight in military applications.

Regional Context: South Asia

In May 2025, India and Pakistan engaged in large-scale drone skirmishes, the first of their kind, ushering in a new AI-driven arms race in South Asia. For the first time, both sides deployed unmanned aerial vehicles (UAVs) at scale, signaling a strategic shift away from traditional platforms toward AI-enabled aerial combat.

India responded with Israeli HAROP loitering munitions, Polish WARMATE drones, and indigenous systems, while Pakistan utilized a mix of Turkish-origin YIHA-III, domestically produced Shahpar-II, and Chinese drones (Ghoshal, Shahid, & Patel, 2025). To defend against drone incursions, India adapted Cold War-era anti-aircraft guns with modern radar upgrades, whereas Pakistan deployed decoy radars and low-altitude traps.

The conflict sparked a sharp escalation in UAV investments. India plans to triple its UAV expenditure to $470 million and has approved a $4.6 billion emergency defense procurement package, fast-tracking drone development and procurement. Meanwhile, Pakistan strengthened partnerships with China and Turkey, including local drone assembly facilities—some reportedly producing YIHA-III units every two to three days.

Analysts see drone warfare as a low-cost, low-risk means of signaling military resolve while avoiding broader escalation. Yet, such rapid proliferation raises serious concerns, without institutional frameworks or confidence-building measures, the rising autonomy of warfare increases the risk of miscalculation and instability (Altaf & Javed, 2024).

Middle Powers and Military AI Governance

A comparative analysis of middle powers, Turkey, Brazil, and South Africa, provides useful benchmarks for Pakistan in military AI governance.

Turkey

Turkey demonstrates a robust approach to defense AI. Its distributed AI governance model spans multiple agencies, including the Digital Transformation Office and TÜBİTAK's AI Institute, coordinated through defense clusters like SAYZEK to streamline collaboration across industry, academia, and defense R&D (Kurç, 2024). Noteworthy platforms such as the STM Kargu loitering munition utilize on-board ML to autonomously detect and engage targets. Moreover, advanced systems like the Turkish Anka-3 UCAV, operating in a "loyal wingman" role, highlight its capability to integrate AI into sophisticated defense platforms.

Brazil

Brazil's AI strategy emphasizes national sovereignty and capacity-building rather than purely military innovation. The government has proposed a 23 billion reais (~$4 billion) AI investment plan (2024–2028), targeting public-sector innovation, regulatory infrastructure, and talent development. The Brazilian Army also organized the AI in Military Expression of National Power Symposium, promoting ethical standards that ensure human control remains central to military decision-making. However, Brazil has hesitated to participate in military AI governance initiatives like REAIM, signaling a cautious stance in international military AI policy spaces (Liu, 2025).

South Africa

South Africa has launched AI research infrastructure tailored to defense, including the Defence Artificial Intelligence Research Unit (DAIRU) at the South African Military Academy, signaling intent to integrate AI into security frameworks. Yet, national AI strategy continues to be nascent, fragmented, and underfunded, limiting its influence on long-term defense planning.

Lessons for Pakistan

These cases demonstrate that successful military AI governance requires institutional coherence, strategic R&D, ethical oversight, and active integration with broader policy structures. Turkey demonstrates the strength of holding together inter-sectoral clusters, Brazil settles innovation with human influence, and South Africa shows the usefulness and the limits of initial institutional steps. Pakistan has the opportunity to draw from these models to develop an adaptive, ethical and institutionally grounded AI governance structure.

Cross-Comparative Analysis of Military AI Governance

When comparing middle and regional power across the world, cross comparatively, one realizes that there are many ways of going about the field of military AI governance. Such examples are helpful, and Pakistan learns from them, but they are not without warning. The most institutionalized case is that of the US, where artificial intelligence is incorporated into defense through agencies such as the CDAO and programs such as Project Maven that have specific ethical systems in place. This innovation/oversight balance indicates why doctrine and accountability are important. It is necessary to embed them in technological adoption.

China, in its turn, is seeking a quick militarization process based on its civil-military fusion policy, relying on national AI champions and state-imposed orders to hasten the process of so-called intelligentized warfare. Russia takes a centralized but transparent form. It prioritizes battlefield experimentation and AI uses that are enabled by cyber but are not formally governed. This approach highlights the dangers of secrecy and unchecked military innovation.

Turkey, as a middle power, shows how distributed governance and strong links between the defense industry and academia can produce advanced UAVs and export-oriented strength. Brazil, on the other hand, emphasizes sovereignty and moral restraint. South Africa takes a different path, acting as a normative player that pushes for international limits on autonomous weapons.

In contrast to these models, the case of Pakistan shows an increasing technical potential with a gap in governance. It has reached a higher stage in the development of UAV and established institutes such as NCAI and NASTP. Yet, it also does not have an official defense AI policy or ethical code. This comparative perspective supports one of the main theses that governance is as important as technological advancement. For Pakistan, it is vital to learn from both great powers and middle powers. The former offer lessons in institutionalization, while the latter show adaptive strategies. Together, these insights can help bridge Pakistan's civil–military gap and guide responsible AI adoption in defense.

Table 1: Cross-Comparative Analysis of Military AI Governance

Country	Governance Approach	Key Institutions	Military AI Capabilities	Ethical Stance	Gaps/Challenges
US	Centralized (CDAO, DoD)	DARPA, JAIC → CDAO	UAV swarms, Loyal	Human control, Ethical AI principles	Balancing speed with ethics

			Wingman, ISR integration		
China	Civil–military fusion	PLA, State AI Plan	AI-enabled ISR, autonomous UCAVs	Pragmatic, less transparency	Lack of independent oversight
Russia	Centralized, opaque	MOD AI programs	Combat drones, AI for EW	Minimal debate	Poor transparency, sanctions
Turkey	Distributed Clusters	TÜBİTAK AI Institute, Defense clusters	STM Kargu drones, Anka-3 UCAV	Pragmatic, operational focus	Export-driven, limited ethical debate
Brazil	Civilian-led	Ministry of Science & Tech, Army symposium	Early-stage R&D	Strong human-control focus	Lacks defense-specific doctrine
South Africa	Emerging, fragmented	DAIRU, Military Academy	Pilot projects, research labs	Aspirational, academic	Weak funding, fragmented
Pakistan	No formal doctrine	NCAI, NASTP, PIAIC	Burraq, Shahpar-III drones	Supports UN LAWS ban	Civil–military disconnect, lack of legal framework

Governance Gaps & Normative Position

Despite progress in military AI integration, Pakistan lacks a formal doctrine or legal framework governing its use in defense. No official strategy, under the National AI Policy or any defense-specific guidelines, addresses military applications of AI, leaving critical decisions on surveillance, autonomous systems, and targeting in a regulatory vacuum.

An acute civil-military gap still existed. National AI Policy in 2025 focuses on non-military uses and economic endorsement but fails to assert strong governance of military monitoring and ethical consideration (Latif, 2023).

Internationally, Pakistan supports restrictions on lethal autonomous weapons (LAWS), endorsing UN resolutions such as General Assembly Resolution 78/241 and statements within the Convention on Certain Conventional Weapons (CCW), advocating prohibitions on autonomous systems lacking meaningful human control. Yet, these commitments remain unreflected in domestic legislation or doctrinal integration, creating a gap between international advocacy and national practice.

Furthermore, Pakistan's involvement in the larger international AI governance platforms, such as GPAI, REAIM, and the OECD AI Observatory, is minimal, limiting its ability to shape or gain from international advances in AI governance.

Recommendations

Set up a Defense AI Oversight Authority (DAIOA): Create a central body to regulate AI use in the military, coordinate doctrine, and ensure accountability. This will also help connect civil and military AI policies.

Create a Military AI Ethics Charter: Establish clear principles like human-in-the-loop oversight, transparency, and accountability to make sure AI deployment follows humanitarian standards and avoids fully automated combat decisions.

Invest in defense R&D and AI hubs: Expand research and development at institutions like NUST, NCAI, and NASTP to build local capabilities, reduce reliance on foreign suppliers, and strengthen technological independence.

Develop talent pipelines: Offer fellowships, specialized training, and programs linking academia with the military to build expertise in AI-enabled defense systems.

Introduce a South Asian Responsible AI Framework: Promote regional measures, codes of conduct, and controls to prevent escalation and build trust.

Participate in global AI forums: Engage in initiatives like REAIM, GPAI, and OIC to influence international AI rules and standards.

Balance innovation and safeguards: Make sure AI strengthens national security while maintaining ethical oversight and strategic stability.

CONCLUSION

Pakistan has already come a long way towards applying artificial intelligence in the field of defense. Its increasing ability to deploy AI-enabled platforms to support intelligent, surveillance and combat missions is demonstrated in indigenous systems such as the Burraq UCAV and Shahpar-III. Institutional initiatives, including the National Centre for Artificial Intelligence (NCAI) and PIAIC, further demonstrate efforts to develop domestic expertise and talent pipelines, reflecting a determination to remain technologically relevant in an AI-driven security environment.

The drive to governance gaps is, however, leading to a significant challenge to advancement. The long intervals between deployments, lack of special military AI doctrine, civil-military disconnect, and lack of legal and ethical regulation are obstacles to the timing and effect of its operation. While the 2025 National AI Policy addresses civilian applications, it overlooks defense-specific concerns. Experiences in the U.S. in the context of centralised government and ethic architectures; in Turkey in the context of inter-sectoral coordination; and in Brazil and South Africa in the context of policy integration make clear the need to balance innovation with oversight and ethics protection.

To strengthen its national security and also contribute to international stability, Pakistan needs to move beyond being just a user of AI. It should work to become a global leader by adding ethics, regulation, and doctrine into how AI is used.

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