Jointness and Multi-Domain Operations
A Critical Analysis of Doctrinal and Training Imperatives

Swaim Prakash Singh*

Cross-domain convergence, compressed decision timelines, and the expansion of conflict across both physical and cognitive dimensions are reshaping the character of contemporary warfare. In the Indian context, these changes are compounded by a two-front contingency, persistent grey-zone competition, rapid technological diffusion, and the continuing requirement for effective tri-service integration. While Multi-Domain Operations (MDO) have gained acceptance as a framework to address these challenges, its operationalisation remains constrained by gaps between doctrinal articulation and true operational convergence.

This article examines the relationship between jointness and MDOs through a tri-service doctrinal analysis, arguing that existing models of jointness, though essential, are insufficient to generate integrated, time-sensitive effects across domains and levels. It identifies key shortcomings in doctrinal coherence, joint training structures, and institutional alignment that limit the realisation of multi-domain capabilities.

The study further contends that the Indian battlespace context naturally drives MDOs towards a Multi-Domain, Multi-Level (MDML) construct, where vertical integration and cognitive decision-making superiority become dominant. Based on this assessment, the article proposes an Indianised

* Group Captain Swaim Prakash Singh, PhD, is currently serving as a Directing Staff at the College of Aerospace Warfare (CAW), Secunderabad, India.

ISSN 0976-1004 (print); 2583-7567 (online)
© 2026 Manohar Parrikar Institute for Defence Studies and Analyses
Journal of Defence Studies, Vol. 20, No. 3, July-September 2026, pp. 79–101

MDO vision that builds on existing doctrinal foundations while outlining practical pathways for doctrinal refinement, capability development, and a structured joint training continuum. The entire argument is structured around four foundational pillars: technology-infused operational capability, training and human resources, doctrine, and cognitive aspects.

Keywords: *Multi-Domain Operations; Jointness; Technology; Integration; Doctrinal Analysis; Warfare*

"Future conflicts will be decided not by who controls a domain, but by who orchestrates effects across domains and levels simultaneously."

—*Author*

Introduction

Contemporary warfare is undergoing a fundamental transformation, characterised by convergence across domains, shortened decision cycles, and the expansion of the battlefield across both horizontal and vertical dimensions. For India, this transformation is accentuated by a complex two-front security challenge, persistent grey-zone competition, rapid technological diffusion, and the imperative of effective jointness across the Army, Navy and Air Force. Although Multi-Domain Operations (MDOs) is not a new concept, it has become widely accepted as a framework to address these challenges. Its successful planning and execution depend on doctrinal adaptation and training reforms that go beyond traditional ideas of jointness.

This article examines the relationship between jointness and MDOs in the Indian context through a tri-service doctrinal analysis, identifying critical gaps between conceptual articulation and operational convergence. It argues that existing approaches to jointness, while necessary, remain insufficient to deliver integrated effects across domains and levels. Therefore, it must evolve through coherent doctrine, a structured joint training continuum, and aligned institutional incentives.

The article further argues that an effective MDO in India inherently progresses towards a Multi-Domain, Multi-Level (MDML) construct, driven by battlespace verticality and the primacy of cognitive decision-making and concludes with a credible and executable Indianised vision of MDO.

Therefore, the aim of this analytical article is twofold. *First*, it analyses jointness with respect to multi-domain operations within the Indian context, through the lens of existing doctrinal and operational shortcomings. *Second*, it proposes a way forward by amplifying the existing doctrines and articulating

an Indianised MDO vision through building operational capability to guide future doctrinal and training reforms.

Analysing Multi-Domain Operations *vis-à-vis* Jointness

Jointness vs MDOs

Today's security landscape is marked by fast-paced technological change, contested operational domains, and complex hybrid threats. In response, two interrelated but distinct concepts, *Jointness* and *MDOs*, have gained prominence in military doctrines. Although often used interchangeably, they represent distinct stages of the operational construct. For the Indian defence forces, which are pursuing both joint integration and multi-domain capability development, distinguishing between the two is essential for doctrinal clarity and training prioritisation, as has been amply brought out in the Joint Doctrine for Multi-Domain Operations (JDMDO) 2025.[1]

Jointness, in its classical sense, refers to the coordinated planning and execution of operations by two or more services to achieve a common military objective.[2] It is considered that no single service can independently address the full spectrum of modern warfare. Institutional measures such as the creation of the Headquarters Integrated Defence Staff (HQ IDS), integrated tri-service organisations, the Andaman and Nicobar Command, and the appointment of the Chief of Defence Staff (CDS) in 2020, have sought to improve inter-service coordination and strategic coherence.[3]

In practice, however, jointness has often been mixed up with administrative and symbolic integration. Joint education, logistics, maintenance, transport, procurement and support frameworks are frequently claimed as evidence of progress. While these measures are necessary and beneficial, they remain 'administrative enablers rather than indicators of operational jointness'. They improve efficiency and reduce duplication but do not address how combat power is planned, commanded, and employed in conflict. *At best, such measures create a foundation; at worst, they generate an illusion of progress while leaving operational fault lines intact.*

True jointness is tested only in the operational domain. Persistent debates over control of air defence (AD) operations, ownership and employment of aerial assets, intelligence sharing, and common planning processes indicate that jointness remains unresolved, especially at the operational and tactical level. Despite reforms, India's Command-and-Control architecture for planning and operations remains predominantly service-centric, as has been the case with the non-ratification of the Joint Services Study Group on

AD to date. This reality defines the baseline from which more advanced constructs of MDOs must be assessed. Figures 1 and 2 explain the existing operational and training jointness at various levels within the Services, which require review and re-strengthening to meet the challenges and imperatives of MDOs.

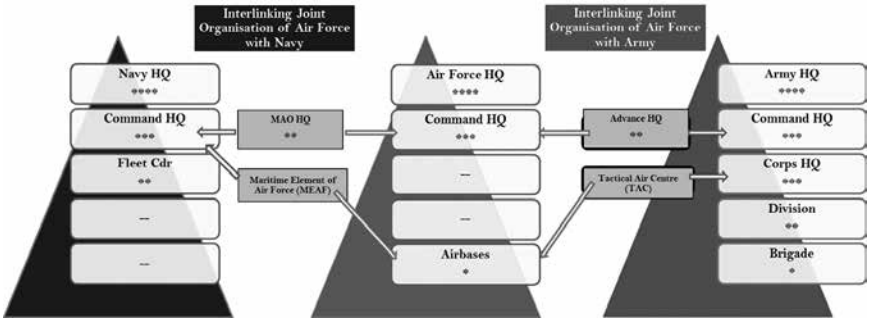


Figure 1 Existing Joint Operational Structures between the Services
Source: Author's articulation.



Figure 2 Existing Joint Training/PME between the Services
Source: Author's compilation and analysis (2023).[4]

MDOs extend the concept of jointness by seeking integrated effects across land, maritime, air, space, cyberspace, and information domains, not ownership. Rather than coordinating service contributions, MDOs aim to

synchronise cross-domain actions to impose multiple, simultaneous dilemmas on an adversary.

The U.S. Army's *FM 3-0 (2022)* articulated the need for MDOs in response to the assessment that strategic competitors such as Russia and China were integrating emerging technologies with evolving military doctrines and operational concepts. They were assessed to be developing capabilities designed to challenge the United States, through multiple layers of stand-offs across space, cyber, air, maritime, and land domains. The central operational challenge, therefore, was to penetrate and overcome these layered stand-off capabilities while maintaining operational coherence. *The U.S. Army in Multi-Domain Operations, 2028* represented an important step in this doctrinal evolution, describing how Army forces, as part of the Joint Force, would 'compete, penetrate, dis-integrate, and exploit'[5] adversaries in future conflict.

In the Indian context, MDOs are envisaged as more than an extension of jointness; they are viewed as a holistic, integrated, 'whole-of-nation' approach that demands new thinking, organisational culture, tools and processes.[6] Their detailed implications in the Indian context have been examined in this article.

India's primary security challenges emanate from China and Pakistan. China, a technologically advanced adversary, has integrated space, cyber and electronic warfare, along with information operations under the People's Liberation Army's Strategic Support Force.[7] Pakistan, backed by collusive partnerships with China and Turkey, is likewise narrowing its capabilities in selected domains.[8]

More significantly, the convergence of Chinese technological capabilities with Pakistan's military potential creates the possibility of a coordinated, multi-domain threat to India. Such a threat could simultaneously target India's land borders, maritime interests, Command and Control system, information environment, and critical technological infrastructure thereby creating dilemmas beyond the conventional battlefield.

The challenge is further compounded by the possibility of simultaneous pressure on the northern and western fronts, supported by capabilities employed across multiple domains. India must therefore be prepared not merely to respond to individual domain-specific threats, but to counter their combined and mutually reinforcing effects as well. These developments increase the relevance of multi-domain integration, particularly along contested land borders, in the Indian Ocean Region and in grey zones.

Doctrinal Analysis

Doctrinal Loop: Although doctrines worldwide establish a set of rules and guidelines, they are never complete and always have the potential for further refinement, based on evolving tangible and intangible scenarios and feedback, collectively forming what may be termed the 'doctrinal loop'. The doctrine of the Indian Air Force has been able to bring out this aspect quite effectively, as shown in Figure 3. It states that 'a doctrine is formulated based on inputs. The input into a doctrine undergoes a rigorous process of Clausewitzian "critical analyses" prior to its absorption. The output provides the framework within which viable military capability can be developed. These capabilities are validated through peacetime exercises or war experiences, and the feedback is used to refine the doctrine further.'[9] The following section is in the same vein, and the service-centric joint doctrines have been analysed with the same doctrinal loop philosophy.

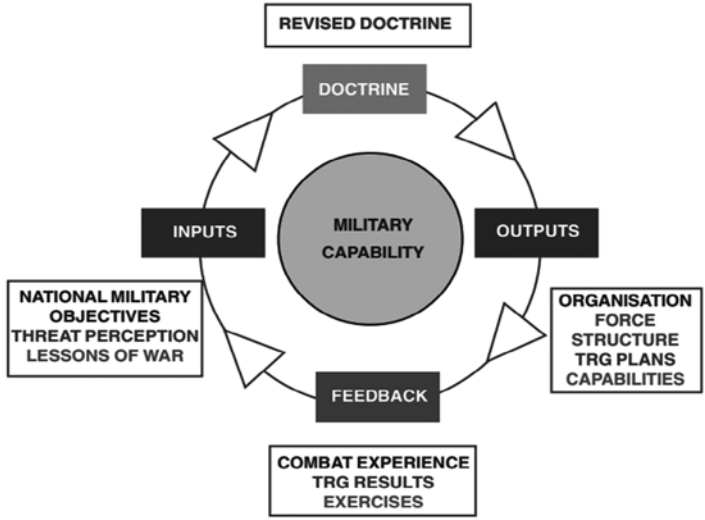


Figure 3 Doctrinal Loop

Source: Doctrine of the Indian Air Force IAP 2000-22, p. 25.

The *Joint Doctrine of the Indian Armed Forces (JDIAF) 2017* represented India's first formal articulation of joint military thought in the open domain.[10] While it did not explicitly address MDOs, it acknowledged space, cyberspace and special operations as part of the modern conflict environment. The subsequent joint training doctrine, prepared in a collegiate manner,[11] aimed

to foster initiative, stimulate creativity, promote integration, and serve as a tri-service foundation and knowledge base. Nevertheless, despite the creation of the Department of Military Affairs, these initiatives have not translated into fully integrated operational processes or command structures.

Service-specific doctrines further illustrate doctrinal fragmentation. The Army's Land Warfare Doctrine (2018) remains land-centric, treating other domains largely as supporting enablers .[12] The Indian Air Force Doctrine (2022) exemplifies future joint doctrines by closely adhering to MDO principles, prioritising information superiority, integrating space capabilities, and utilising networked Command and Control. It is an exemplar for the joint doctrines and a proponent of coordinated air operations as the central integrator.[13] The Indian Maritime Doctrine (2025) recognises the inherently, multi-domain nature of maritime operations, but it continues to prioritise interoperability over doctrinal convergence.[14] These doctrines collectively illustrate the existence of multi-domain concepts, albeit through service-specific perspectives.

IAF Doctrine as an Exemplar: The IAF Doctrine 2022 stands out as an exemplar of clear doctrinal articulation, offering a coherent vision of air power employment aligned with emerging operational realities, challenges and joint warfighting imperatives in multi-domain environments. It distinguishes itself by defining principles, roles and strategic intent rather than merely prescribing procedural detail, thereby providing a conceptual framework to guide planning, capability development and operational thinking. This highlights an important distinction that the Services must internalise: a doctrine is not a manual or a précis. While the doctrine establishes enduring philosophy, guiding principles, and the logic of employment, manuals and operational publications translate these into detailed procedures, tactics and execution-level instructions. While the other doctrines are exhaustive in what they need to do to achieve their specific objectives, the IAF doctrine explains in detail, the air, land or maritime air campaign, and the other campaigns it prosecutes. The IAF doctrine is a comprehensive document that serves as an exemplar for other doctrines to follow, although it has scope for further revision based on the doctrinal feedback loop.

The *Joint Doctrine for Multi-Domain Operations (JDMDO) 2025*, released at Ran Samwad 2025, aims to reduce fragmentation by offering a common framework for cross-domain integration. Its *six-domain construct*[15] of land, sea, air, space, cyberspace and cognitive domain formally acknowledges cognitive effects as operationally significant. While JDMDO-2025 marks an important doctrinal advance, its success will depend on converting concepts

into practical planning, execution and training mechanisms. Although the doctrine outlines key characteristics, structures and future pathways, *its inclusion of the cognitive domain and emphasis on a Whole-of-Nation Approach (WoNA) remain largely aspirational concepts that require reasoned dialogue and considered deliberations.*

Understanding Domains of Warfare and the Recognition of Whole-of-Services Approach (WoSA)

A 'domain of warfare' has a precise operational definition.[16] It is a distinctive and bounded environment in which military forces can be deployed, manoeuvred, contested and controlled to achieve military objectives. Land, sea, air and space meet these criteria. They are physically definable environments that provide measurable terrain—land, maritime, atmospheric, or orbital—albeit subject to legal constraints,[17] within which military power can be applied. Control within these domains is observable, contestable and assessable through outcomes such as territorial gain, sea control, air superiority, or space denial.

By contrast, the 'cognitive' and 'cyber' constructs as enunciated in JDMDO 2025 fail to meet these foundational criteria and should not be equated with classical warfighting domains. Cognition is not an environment, but an internal human process shaped by psychology, culture, leadership, military and social contexts.[18] It has no independent existence, no terrain, and no defensible or seizable boundaries. Military forces cannot manoeuvre with cognition, and neither can cognitive control be established in a deterministic manner. Cognitive effects, such as morale, perception, decision-making, etc., are outcomes of military operations conducted in recognised domains, not battlespaces themselves. *Treating cognition as a domain confuses influences with manoeuvring and effects with terrain.*

'Cyberspace', while more tangible than cognition, also differs fundamentally from classical domains. Though recognised as an operational domain by the US,[19] cyber operations occur within man-made, logic-based networks layered over physical infrastructures.[20] It cannot be occupied or held in the traditional military sense, and cyber control is inherently transient, reversible and context-dependent. Cyber terrain is continuously reconstituted through users, software updates and network reconfigurations, rendering effects non-exclusive and non-persistent. *Cyberspace is therefore more accurately understood as an operational vector or a capability set or function rather than as a standalone domain of warfare.*

While WoNA is desirable and reflects the contemporary character of conflict, it is executable only if the military instrument achieves internal coherence through the Whole-of-Services Approach (WoSA) as a prerequisite. WoSA addresses the foundational challenge of making intra-service jointness and integration work. Without resolving service-centric seams, expecting effective national-level integration is operationally unrealistic. *Doctrinally, WoSA constitutes the operational foundation, while WoNA is its strategic extension; reversing this sequence weakens execution.*

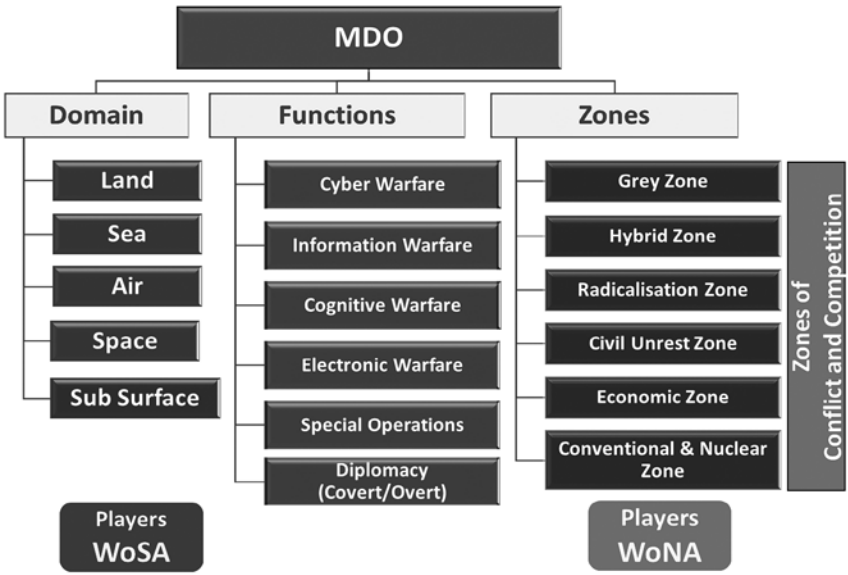


Figure 4 Analysis of MDOs
Source: Author's analysis and articulation.

Having discussed the domains of warfare, Figure 4 presents proposed MDOs as an integrated framework that brings together domains, functions, and zones to generate strategic and operational effects. The basic domains are the physical domains of warfare: land, sea, air and space. *The subsurface (undersea) domain has also received limited attention in Western discourse and is therefore yet to gain wider global recognition.*[21] *The time is not far off when the sub-surface will find a place in the literature.* These domains constitute the primary battlespace and are predominantly the responsibility of the Services.

Effective MDOs therefore hinge on the synergised employment of WoSA, ensuring unity of effort across domains.

Covering these domains are key cross-cutting functions: cyberspace, information, cognitive and electronic warfare, special operations, and diplomacy (covert and overt). While the Services play a critical role in many of these areas, their effective employment, particularly in the information, cognitive, economic, and diplomatic spaces, requires a WoNA.

Domains and functions combine their effects across various zones of conflict and competition.[22] Besides full-scale war and nuclear areas, these also include grey and hybrid zones, where actions stay below the level of traditional war, while maintaining areas of radicalisation, economic issues, and creation of civil unrest, where influence, pressure and instability are sought for, by using a mix of military and non-military methods.

Way Ahead: Through Indianised Redefined MDO (MDO-ML) Vision

> "*We need to accept the fact that tomorrow's conflict cannot be fought with yesterday's mindset.*"
>
> *– Air Chief Marshal VR Chaudhari*

The CDS, General Anil Chauhan, while releasing the JDMDO 2025, envisioned and desired that the document be the first step by the Indian defence forces to define and understand this new way of conducting operations. He further emphasised that 'it broadly conceptualises how the three services will organise, plan, and fight to defeat the adversary in any domain and at any level of war. I expect each one of us to contribute towards further improving this maiden joint publication and making it robust over a period.'[23]

While the relevance of administrative jointness is acknowledged, there is a need to deliberate on the operational jointness not only across multiple domains but also at multiple levels. Aligned with the stated desire and objective, the following section brings out the outline to contribute to the robust MDO vision. The issues brought up are operational, doctrinal, and cognitive.

Conceptual Transition from MDO to Synergised MDO-ML Warfare

MDOs are not new. However, a formal articulation by the US Army in 2018[24] brought renewed doctrinal and academic traction. Contemporary

conflicts demonstrate that future warfare will transcend traditional Service boundaries and linear battlefields through cross-domain effects, battlespace verticality, and the rapid integration of sensors and shooters for accelerated decision-making. Consequently, MDOs remain conceptually incomplete unless expanded into a synergised Multi-Domain, Multi-Level (MDML) warfare construct.[25] To further strengthen and make the Indian JDMDO 2025 more effective and future-ready, it can be redefined and termed as MDO-ML. Subsequent arguments are drawn from this hypothesis.

MDO-ML explicitly incorporates vertical battlespace, from sub-surface and surface-to-air, near-space, and outer space, wherein actions at one level generate immediate effects across others. This necessitates treating horizontal and vertical operations as a single operational problem and moving beyond mere inter-Service coordination towards true convergence of effects. Effective adoption of MDO-ML demands an Indianised doctrinal reorientation, enabled through balanced transformation across four foundational pillars of *Technology-Infused Operational Capability*, *Training and Human Resource*, *Doctrine*, and the *Cognitive*, as shown in Figure 5. The essence of MDO-ML warfare lies in convergence, not jointness alone.

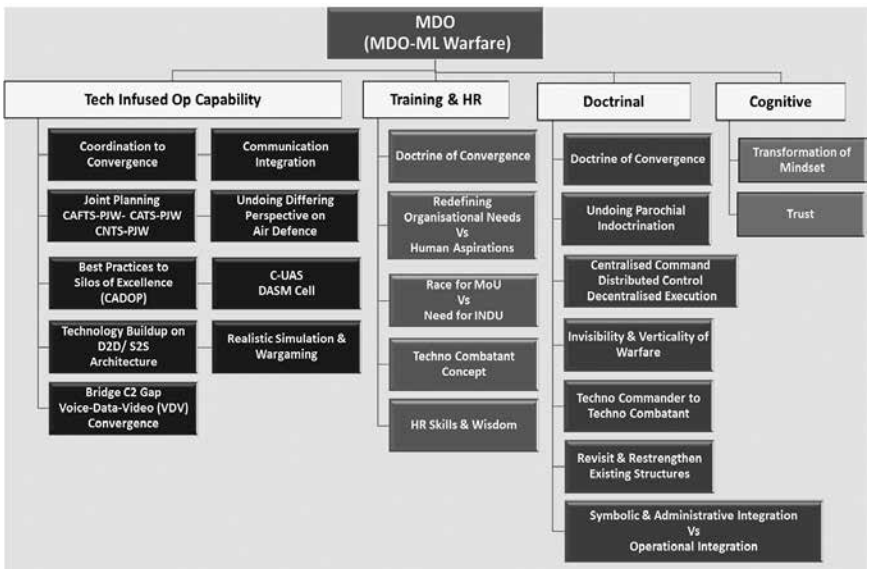


Figure 5 Doctrinal and Training Adaptation for Redefined MDO: Challenges to Futuristic MDO-ML Warfare Tree

Source: Author's analysis and articulation.

Technology Infused Operational Capability

The efficacy of operational capabilities in MDO-ML warfare relies on the harmonious integration of tactics, techniques, procedures and technology,[26] unlike the current framework, wherein operations and technology function separately. Consequently, the foundational pillar of technology-infused operational capability is indispensable as a cohesive entity.

Coordination to Convergence and Joint Planning

JDIAF-2017 conceptualises jointness as coordination and synergy among services. However, in practice, operations are often planned independently and executed jointly where needed, increasing the risk of diluted outcomes. Therefore, the convergence of coordinated operations requires participation rather than ownership, ensuring integrated effects that exceed the sum of individual actions. Such convergence can be built by adopting the best practice of the IAF's Command Air Tasking and Strike Planning for Aerial Warfare (CATSPAW) framework. Creating analogous Army and Navy planning cells, such as Command Army Tasking and Strike Planning for Joint Warfare (CATSPJW) and Command Navy Tasking and Strike Planning for Joint Warfare (CNTSPJW) will be beneficial. *These cells can plan and execute inter-Service war-gaming quadrimesterly, to proactively mitigate friction, duplication, conflict and casualties during execution of MDO-ML warfare*. The nomenclature could be jointly derived and devised in a manner that is mutually acceptable and convenient to all three Services.

Adopting Best Practices as Silos of Excellence

Rather than reinventing structures, adopting time-tested mechanisms from each Service, as best practices can significantly strengthen joint operational capability. The transformation of the IAF's Air Defence Ground Environment System (ADGES) into the Integrated Air Command and Control System (IACCS) has already reshaped the orchestration of air operations. Instead of viewing such systems as Service silos, they should function as 'Silos of Excellence', into which other Services can converge through a plug-and-play model to enable integrated MDO-ML warfare through the Common All Domain Operational Picture (CADOP).[27]

Building Operational Capacity through D2D-S2S Template

Though the Services may have their procurement wishlist, a basic yet extremely effective template could be derived from the Detection-Identification-Interception-Destruction (D2D)[28] template, aligned with Sensor-to-Shooter

(S2S) loops, as everything in warfare is subsumed under this broad heading. MDO-ML warfare with net-centric capability is an inevitable necessity, with air and space domains being common to all other domains. This scenario requires identifying and acquiring the assets, systems, and architectures necessary to deliver D2D/S2S at scale to build up the operational capacity. Figure 6 provides a pictorial representation of the likely key assets that require central procurement.

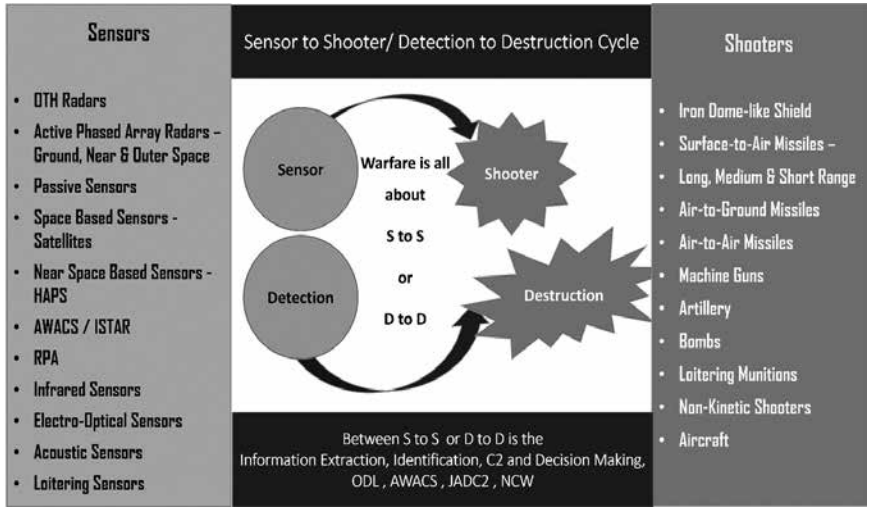


Figure 6 Likely Need-based Technology in D2D/S2S Cycle
Source: Author's analysis and articulation.

Bridging Command and Control (C2) Gap, VDV Convergence and Communication Integration

In the past two decades, military warfighting has seen exponential growth in basic C2 structures through concepts and technology. Globally, it has risen from analogue C2 to digital C3, C4 and C7ISR. With the inclusion of Artificial Intelligence (AI), Machine Learning (ML) and quantum computing, military warfighting is expected to change phenomenally, and it would become QC7AI3SR.[29] Similarly, effective MDML warfare requires the mandatory convergence of the communication grid and Voice-Data-Video (VDV) architecture for inter-domain communication. However, Figure 7 clearly shows the current practical status of Services in C2 capability.

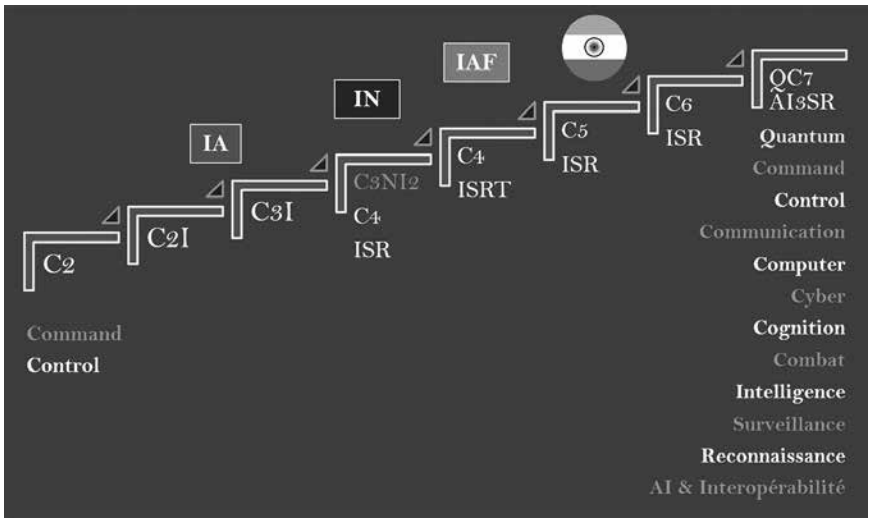


Figure 7 Evolution and Current Status of Services in C2 Structure
Source: Author's analysis and articulation (2023)[30]

Undoing Differing Perspective on Air Defence

The air defence operation's principles, objectivity and execution have been influenced by competing perspectives to claim ownership, causing uncertainty and chaos that even challenge the Union's war book.[31] To compound this tyranny, the rapid expansion of Unmanned Aerial Systems (UAS) and counter-UAS systems and self-designated airspace ownership at extremely low tactical levels have increased airspace deconfliction, jamming, and fratricide hazards. The scenario requires a formal *Drone Airspace Management (DASM) Cell* in the C-UAS grid with units from multiple services and civil agencies for coordinated and disciplined operations. For MDO-ML warfare to function, *it requires serious brainstorming behind closed doors to function; otherwise, it will remain merely aspirational and potentially detrimental.*

Realistic Simulation and Wargaming

Every military service employs distinct mechanisms and tools to simulate warlike scenarios, typically encompassing wargaming and tabletop exercises and culminating in live command or corps-level exercises. While simulations primarily focus on processes and courses of action, live exercises emphasise the tangible outcomes of victory. However, an imbalance often exists between these processes and outcomes, a complexity that further intensifies

in the MDO construct. To rigorously test strategies, assess risks, and refine decision-making across interconnected domains, convergence between the services will be required, right from operational planning to the execution stage. There is a significant opportunity to develop a realistic joint operational planning and wargaming tool. The existing/current efforts at the staff college and higher command levels, require a new perspective and updates to remain relevant in the face of rapid technological changes and complex threat landscapes. It will help provide a shared intellectual framework for jointness, not merely as coordinating services but as achieving true integration of efforts across domains. Establishing joint simulation centres, embedding wargaming within doctrinal and operational planning cycles, and linking outcomes to capability decisions would accelerate readiness for future conflicts.

Training, Human Resource and Doctrinal

Training, human resources and doctrine are deeply interrelated, and MDO-ML warfare requires them to align skills, career growth and institutional incentives. Although the Services have modified syllabi, instructional methods, and doctrinal references to reflect changing realities, the underlying construct of training, the psyche, core objectives, and HR management patterns have essentially remained unaltered since Independence. Even the 2018 HQ IDS Training Doctrine has not incorporated changes within these deep-rooted mechanisms. To succeed, the Services must fundamentally rethink training and skill development, especially for developing technologies and new domain policies, to fit with MDO-ML warfare realities.

Redefined Organisational Needs vs Human Aspirations

It seems almost paradoxical that the organisation wants to be a highly competitive and future-ready force. However, most of its newer domains and functions are staffed by individuals who are otherwise deemed unsuitable for mainstream roles. When these workforces acquire credible expertise and bring merit to the domains and functions, there is no career progression for them. A fresh outlook is necessary to align organisational needs with human aspirations, as this dichotomy will not achieve the ultimate organisational objective. *This dilemma is not a peripheral issue. It is a core HR challenge that demands closed-door, open-minded, realistic deliberation.*

Race for MoUs vs Need for INDU

Under the guise of training, several formations, training institutions and units enter into a Memorandum of Understanding (MoU) with civil agencies and

academia. While comprehensive data is not publicly available, the number of active MoUs is likely substantial.[32] Whether these interactions result in quantifiable institutional results that go beyond personal gains is debatable. To address this, *a committed, impartial Indian National Defence University (INDU) is desperately needed to plan, execute, and simplify critical military requirements at the strategic and operational levels while also offering professional military education to the Services*.

Techno Commander to Techno Combatant

There has been a push for the 'Techno-Commanders' concept in recent times, which is directionally correct, but MDO-ML effectiveness will ultimately depend on the combatant at the cutting edge. *Technological competence must therefore be built bottom-up, not merely driven from the top-down direction.* We urgently need to re-examine the training and skill acquisition process for the combatant, transforming them into a techno-combatant.

Undoing Parochial Indoctrination

Service-centric indoctrination is so ingrained that it becomes difficult to overcome. This mindset undermines joint warfighting and hinders necessary doctrinal evolution. This issue is exacerbated by the institutionalisation of shallow or incorrect lessons learnt from conflicts. Still calling the Air Force an 'Air Arm'[33] or using imprecise words like 'Air Littoral'[34] to claim ownership and relevance leads to confusion, fratricide and battlespace anarchy. Tagging fancy phrases like 'Non-Contact Warfare'[35] requires thorough indoctrination, as air power engages targets through electronic surveillance much before visual acquisition. Similarly, 'Unified AD'[36] is another idea that is often misrepresented. Air defence systems have always been unified. Complete airspace management requires land and sea assets to interface with air control and reporting systems. *Procedural non-compliance cannot be used as justification for doctrinal reinvention.*

Centralised Command, Distributed Control, and Decentralised Execution

The principle of *Centralised Command, Distributed Control, and Decentralised Execution* has been articulated repeatedly in Indian military doctrines, joint publications and professional discussions. The term itself is not new. It has long been acknowledged as a sound command philosophy. However, *despite frequent doctrinal references, it has not been fully accepted, institutionalised, or consistently practised across Services.*

Invisibility and Verticality in Warfare

Future warfare will be dominated by invisible domains that produce visible effects on the ground, requiring training and doctrine to internalise invisibility and verticality as core constructs. *Air, space, and sub-surface operations will increasingly shape outcomes, while land and sea domains will primarily serve territorial control and defence.* Recognising and institutionalising this shift early is essential for effective MDO-ML warfare.

Revisit and Restrengthen Existing Joint Structures

While in the name of reforms, the creation of new structures and coining of new terminologies takes primacy, the essence of actual reform that can shape the reality, suffers. There is a need to review and re-strengthen the existing joint structures, such as Advance HQ, Ground Liaison Officer (GLO), Tactical Air Centers (TAC), Maritime Air Operations (MAO) HQ, Maritime Element of Air Force (MEAF), etc., to enable them to function effectively within the MDO-ML construct. These organisations can produce phenomenal results in cross-domain planning and operations, if existing procedures and HR selection and manning criteria are reviewed based on actual need and purpose.

Symbolic/Administrative vs Operational Integration

Services must not get disillusioned with symbolic or administrative integration; rather, they should focus on operational integration to become a truly joint and future-ready force. True MDO-ML jointness lies in convergent planning and effects-based execution. There are only a few such instances of operational integration, such as the famous Dakota landing at Leh in 1948; 'when, with the medium of air as the only option left, Major General KS Thimayya and Air Commodore Baba Mehar Singh jointly worked out an attempt to land at Leh with immediate reinforcements that the army leaders in the fields at Leh were frantically asking for.'[37] Also, a case in point is the recently demonstrated integrated operations by the IAF's C-17, which helped the Navy seize the hijacked vessel *MV Ruen* in the Arabian Sea in March 2024.[38]

Transformation of Mindset (Cognitive)

Since Independence, the Services have largely planned and fought wars through service-centric approaches, with joint operations remaining limited and incidental. In modern warfare, such mindsets must converge to enable effective MDO-ML warfare. The most critical requirement is a genuine transformation of mindset. Despite the defence reform of jointness in the

post-Kargil review in 2000, and after five years since the creation of the DMA in 2019, progress on jointness has been limited. *The primary reason is not operational or administrative, but rather a lack of mindset transformation.* Cognitive change is therefore fundamental to MDO-ML warfare, as true convergence depends more on *mindset and trust than on organisational structures alone*. There is a need for a dedicated, neutral, progressive *Navchintan Samwad*, free from Service biases, as a prerequisite for achieving meaningful cross-domain jointness and true integration.

Implementation Timelines

Services have a peculiar template for drawing implementation strategies with short, mid- and long-term goals spread over decades. Unfortunately, today, neither the IAF nor the Army and the Navy can afford to follow this template, especially for an unforeseeable long-term goal. Services cannot wait for the target of 2047 to achieve complete transformation. They will have to seriously ingrain it in their operational planning and procurement guidelines to set the target of Mission @2032 as a landmark deadline, that is also aligned with the centenary year of the IAF. Seven years is enough time to transform, provided the Services switch their throttle to maximum power. Services, if required, may consider resorting to escalating their demands to make the whole-of-government approach work in their favour, for national security.

Defence forces, with their Mission @2032, must lead the transition towards a future-ready Joint Force, fostering seamless coordination among them, across all domains and functions, which is the need within the ever-changing, contested, complex battlespace.

Conclusion

The article concludes that while jointness remains a necessary foundation, it is insufficient by itself to deliver the integrated effects demanded by contemporary warfare. While the Indian Army, Navy and Air Force doctrines show increasing convergence on jointness, gaps remain in operational construct and logic, parochial indoctrination in linearity, dissonance in command authority, and in meeting established doctrinal tenets.

As the battlespace expands vertically and decision superiority becomes decisive, MDOs must logically evolve into a Multi-Domain, Multi-Level construct tailored to India's strategic context. This requires a doctrine of convergence that is scenario-driven, technologically empowered and

operationally executable. Services must also be prudent not to get misled by symbolic or administrative integration with *true operational integration*.

Doctrinal adaptation and shake-up in training reform reinforced through four foundational pillars of *Technology-Infused Operational Capability*, redefining of *Training and Human Resources*, *Doctrinal*, and *Cognitive function* is the dire need of the hour to form the joint intellectual wealth and tri-services human foundation, for an effective MDO-ML warfare. The technologically empowered, future-ready force requires both equipment and operators, but more importantly, it entails the transformation of mindset, which will never fructify if Services follow the status-quoist approach.

Recommendations

Having discussed various shortcomings and futuristic thoughts for the MDO-ML construct, this article recommends the following measures under broad doctrinal, organisational, training, capability-building and policy reforms:

- An indoctrinational narrative on jointness, integration and multi-domain operations needs to be spelt out clearly.
- To make the doctrinal articulation more effective, the ability to discern and differentiate between doctrine, précis and manual needs to be appreciated.
- Differentiation in domains and functions needs to be crystal clear, and it requires more brainstorming within defence forces, academia and think tanks.
- A reassessment of the cognitive and cyber functions as domains of warfare must be conducted immediately.
- Focus on the Whole-of-Services Approach (WoSA) as the operational prerequisite, while sustaining the Whole-of-Nation Approach (WoNA) as its strategic extension, rather than the other way round.
- Appreciate multi-domain operations (MDOs) in the multi-domain, multi-level (MDML) construct, as contemporary and futuristic warfare is all about invisibility and verticality as doctrinal, operational, and training imperatives.
- Indianised doctrinal reorientation towards MDO-ML through balanced transformation across four foundational pillars, i.e., technology-infused operational capability, training and human resources, doctrine, and the cognitive domain is the need of the hour.
- Transition from coordination to convergence through joint planning participation rather than ownership.

- Institutionalise best practices as 'Silos of Excellence', enabling plug-and-play integration by other services through a Common All-Domain Operational Picture (CADOP).
- Build capability through detection-to-destruction and sensor-to-shooter loops at scale.
- Bridge C2 gaps by converging communication grids and voice-data-video architectures.
- Resolve doctrinal uncertainty in air defence, UAS employment, and airspace deconfliction by implementing formal drone airspace management mechanisms.
- Establish alignment between organisational needs and individual aspirations in emerging domains.
- Establish a dedicated Indian National Defence University (INDU).
- Move beyond 'Techno-Commanders' to developing the frontline 'Techno-Combatant'.
- Undo parochial indoctrination and terminological imprecision that generates operational confusion.
- Reaffirm the institutionalised, long-articulated principle of Centralised Command, Distributed Control, and Decentralised Execution.
- Avoid the illusion of symbolic integration and focus on operational convergence instead.
- Facilitate a dedicated, neutral, progressive transformation of mindset dialogue, *Navchintan Samwad*, that is free from service biases, as a prerequisite for meaningful cross-domain jointness and true integration.
- Undo the traditional reform outlook with deadlines of short, medium- and long-term by defining the Mission @2032, aligned with the IAF centenary, as a realistic landmark deadline for building operational capability and capacity.

Disclaimer: *Online AI tools were used for copyediting. All content and expert analysis remain the author's own.*

Notes

1. 'MDO vs Joint Operations', Joint Doctrine for Multi Domain Operations 2025, p. 10, available at https://usiofindia.org/pdf/file_68c3c9dd2b33e.pdf, accessed on 27 January 2026.
2. 'Joint Doctrine Indian Armed Forces 2017', Headquarters Integrated Defence Staff, Ministry of Defence, Government of India, p. 39, available at https://bharatshakti.

in/wp-content/uploads/2015/09/Joint_Doctrine_Indian_Armed_Forces.pdf, accessed on 27 January 2026.

3. 'HQ Integrated Defence Staff Celebrates its 25th Raising Day', Press Information Bureau, Ministry of Defence, Government of India, 1 October 2025, available at https://www.pib.gov.in/PressReleasePage.aspx?PRID=2173436&reg=3&lang=2#:~:text=Headquarters%20Integrated%20Defence%20Staff%20(HQ,CCC)%20at%20the%20apex%20level, accessed on 27 January 2026.
4. Swaim Prakash Singh, *Indian Air Force and Integration of Armed Forces*, New Delhi, KW Publishers, 2024, p. 176.
5. 'The U.S. Army in Multi-Domain Operations, 2028", TRADOC Pamphlet 525-3-1, Foreword, p. i, 6 December 2018.
6. "Foreword", *Joint Doctrine for Multi Domain Operations 2025*, p. iv.
7. John Costello and Joe McReynolds, 'China's Strategic Support Force: A Force for a New Era', Center for the Study of Chinese Military Affairs, Institute for National Strategic Studies, No. 13, Washington, D.C., National Defense University Press., October 2018), available at https://digitalcommons.ndu.edu/cgi/viewcontent.cgi?article=1006&context=china-strategic-perspectives, accessed on 27 December 2025.
8. 'Operation Sindoor Exposed Multifront Threat as China and Turkey Backed Pakistan, Indian Army Says', *India Sentinels*, 4 July 2025, available at https://www.indiasentinels.com/army/operation-sindoor-exposed-multi-front-threat-as-china-and-turkey-backed-pakistan-indian-army-says-6913#:~:text=This%20marked%20a%20concerning%20escalation,Pakistan's%20military%20capabilities%20against%20India.&text=Turkey%20emerged%20as%20the%20third,drone%20systems%20during%20the%20conflict, accessed on 27 January 2026.
9. *Doctrine of the Indian Air Force IAP 2000-22*, p. 25.
10. 'Foreword', *Joint Doctrine Indian Armed Forces-2017*, Bharat Shakti, available at https://bharatshakti.in/wp-content/uploads/2015/09/Joint_Doctrine_Indian_Armed_Forces.pdf, accessed on 21 January 2026.
11. 'Joint Training Doctrine Indian Armed Forces-2017 Released', Press Information Bureau, Ministry of Defence, Government of India, 14 November 2017, available at https://www.pib.gov.in/newsite/PrintRelease.aspx?relid=173509&reg=3&lang=2, accessed on 25 January 2026.
12. Author's analysis based on *Indian Army Land Warfare Doctrine 2004*, New Delhi, Integrated Headquarters of Ministry of Defence (Army), 2004; Indian Army, *Land Warfare Doctrine 2018*, New Delhi, Integrated Headquarters of Ministry of Defence (Army), 2018.
13. Author's analysis based on *Doctrine of the Indian Air Force 2022*,New Delhi, Integrated Headquarters of Ministry of Defence (AIR), 2022.
14. Author's analysis based on *Indian Maritime Doctrine 2025,* New Delhi, Integrated Headquarters of Ministry of Defence (Navy), 2025.

15. 'Foreword', *Joint Doctrine for Multi Domain Operations 2025*, n. 6, p. iii.
16. 'Domains of Warfare', *Oxford Law Pro*, available at https://academic.oup.com/oxford-law-pro/book/57203/chapter-abstract/474120619?redirectedFrom=fulltext, accessed on 25 January 2026.
17. 'Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies- 1967', United Nations Office for Outer Space Affairs (UNOOSA), available at https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html, accessed on 18 January 2026.
18. Elizabeth B. Gross and Sara E. Medina-DeVilliers, 'Cognitive Processes Unfold in a Social Context: A Review and Extension of Social Baseline Theory', National Library of Medicine, available at https://pmc.ncbi.nlm.nih.gov/articles/PMC7076273/, accessed on 18 January 2026.
19. Department of Defense Strategy for Operating in Cyber Space, July 2011, available at https://csrc.nist.gov/csrc/media/projects/ispab/documents/dod-strategy-for-operating-in-cyberspace.pdf, accessed on 21 January 2026.
20. Brad Bigelow, 'The Topography of Cyberspace and Its Consequences for Operations', 2018, 10th International Conference on Cyber Conflict, NATO CCD COE Publications, Tallinn, available at https://www.ccdcoe.org/uploads/2018/10/Art-07-The-Topography-of-Cyberspace-and-Its-Consequences-for-Operations.pdf, accessed on 30 December 2025.
21. Authors analysis of future warfare. Author opines that such vision is yet to get recognition.
22. Author's analysis and appreciation of futuristic MDO/MDML Warfare in 2025.
23. *Joint Doctrine for Multi Domain Operations 2025*, n. 6.
24. 'The U.S. Army in Multi-Domain Operations, 2028', TRADOC Pamphlet 525-3-1, 6 December 2018.
25. Coined by the Author. MDOs will eventually have to be recognised not only as multi-domain but also at multiple levels from sub-surface to outer space through sea, land, air and near space in transit.
26. Niraj Pandit, 'Future Wars will be Multi-Domain, Tech-Driven: CDS Anil Chauhan', *Hindustan Times*, 23 December 2025, available at https://www.hindustantimes.com/cities/mumbai-news/future-wars-will-be-multi-domain-tech-driven-cds-anil-chauhan-101766430836556.html, accessed on 28 December 2025.
27. *Joint Doctrine for Multi Domain Operations 2025*, n. 6, p. 19.
28. Coined by the Author.
29. The term QC7AI3SR and its expanded formulation are conceptualised by the author. It stands for *Quantum, Command, Control, Communication, Computers, Cyber, Cognition, Combat, Intelligence, Surveillance, Reconnaissance, Artificial Intelligence and Interoperability*.

30. Swaim Prakash Singh, *Indian Air Force and Integration of Armed Forces*, n. 4, p. 129.
31. 'What is the Union War Book, which has guided Indian officials during "Operation Sindoor" against Pakistan', *OpIndia,* 12 May 2025, available at https://www.opindia.com/2025/05/union-war-book-operation-sindoor-guide-details-explained/#:~:text=12%20May%2C%202025-,What%20is%20the%20Union%20War%20Book%2C%20which%20has%20guided%20Indian,identities%20of%20its%20rightful%20custodians, accessed on 27 January 2026.
32. The number is expected to exceed one hundred, considering the formations, units and training institutes across the three services.
33. The organised military aviation component of army, responsible for achieving and exploiting control of the air and delivering air power effects for land forces.
34. The contested vertical space extending from the earth's surface up to 10,000 feet in airspace, where army intends taking ownership for their operations.
35. A form of warfare in which decisive effects are achieved without physical engagement by the boots on the ground.
36. An integrated, joint air defence construct that centrally coordinates sensors, shooters and Command-and-Control across services to counter aerial and missile threats holistically.
37. Swaim Prakash Singh, *Indian Air Force and Integration of Armed Forces*, n. 4, p. 21.
38. Ravi Shankar, 'Joint Operation: IAF's C-17 Helps Navy Seize Hijacked Vessel MV Ruen In Arabian Sea', *Bharat Shakti*, 17 March 2024, available at https://bharatshakti.in/joint-operation-iafs-c-17-helps-navy-seize-hijacked-vessel-mv-ruen-in-arabian-sea/, accessed on 24 January 2026.