

Strategy for Implementing Multi-Domain Operations After the Enactment of Law No. 21 of 2025 concerning Airspace Management: A Legal and Defense Perspective

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Abstract

The defense capability of a nation in conducting Multi-Domain Operations (MDO) has become an essential requirement in facing modern multidimensional warfare threats. In Indonesia, the enactment of Law No. 21 of 2025 concerning Airspace Management provides a more dynamic legal foundation for integrating airspace management into the national defense system. However, the implementation of this law still faces various gaps, including regulatory disharmony between civilian and military perspectives, institutional fragmentation, data silos between systems, and dependence on foreign technology. This study employs a qualitative descriptive-analytical approach based on data from the Seskoau A-64 workshop to analyze the real conditions of MDO implementation readiness following the enactment of Law No. 21/2025. The analysis reveals five main strategic issues hindering cross-domain interoperability. To address these, an implementation strategy is formulated using the McKinsey 7S framework, covering shared values, structure, systems, style, staff, skills, and strategy. This strategy is then operationalized into a phased roadmap (short-term, medium-term, and long-term) along with a stakeholder role matrix. The study concludes that policy harmonization, strengthening of cross-sectoral institutions, integration of network-centric command and control systems, and achievement of technological self-reliance are the primary prerequisites for successful MDO implementation in Indonesia. Without an applicable and measurable roadmap, the potential of Law No. 21/2025 as an enabler for national air defense will not be optimally realized.

Keywords: Multi-Domain Operations, Airspace Management, Law No. 21 of 2025, Interoperability, Defense Policy Implementation, McKinsey 7S Framework

INTRODUCTION

In the evolving landscape of contemporary warfare, the capacity of a nation to execute Multi-Domain Operations (MDO) has transitioned from a strategic aspiration to an operational imperative. MDO represents a paradigm shift in military doctrine, demanding the seamless integration and synchronization of capabilities across land, maritime, air, space, and cyberspace domains to generate converging effects that overwhelm adversaries at the speed of relevance (US Army, 2018; NATO, 2025). As articulated in the U.S. Army's TRADOC Pamphlet 525-3-1, MDO is structured around a theory of victory encompassing five core phases: compete, penetrate, disintegrate, exploit, and re-compete. This framework prioritizes not merely the employment of individual assets but the orchestration of cross-domain effects to penetrate Anti-Access/Area Denial (A2/AD) systems employed by near-peer adversaries. Central to MDO success are the principles of integration, synchronization, information and decision superiority, agility, and the exploitation of interdependencies between domains. NATO's Alliance Concept for Multi-Domain Operations further reinforces this by emphasizing the orchestration of military and non-military activities to achieve effects that traditional single-domain operations can no longer deliver in an era of hybrid threats, cyber intrusions, electronic warfare, and space-based disruptions (NATO, 2025).

For Indonesia, a vast archipelagic nation with extensive airspace sovereignty responsibilities, the adoption of MDO principles is critical to safeguarding national defense amid escalating regional dynamics in the Indo-Pacific. The Indonesian National Armed Forces (TNI), particularly the Indonesian Air Force (TNI AU), must evolve from siloed service-centric

operations toward a joint, all-domain posture capable of rapid decision-making and resilient command and control (C2). Airspace management emerges as the linchpin in this transformation, serving as the connective tissue that enables real-time data fusion, sensor integration, and dynamic force employment across domains. Without robust airspace control, MDO risks fragmentation, where delays in detection, identification, and response could compromise national sovereignty and operational superiority.

The legal architecture underpinning Indonesia's airspace governance has undergone a transformative milestone with the enactment of Law No. 21 of 2025 on Airspace Management (UU 21/2025), promulgated on 24 December 2025. This legislation marks a deliberate departure from the civil aviation-centric paradigm of Law No. 1 of 2009 on Aviation, which primarily addressed safety, ICAO compliance, and commercial air navigation. UU 21/2025 elevates airspace management to a matter of national sovereignty, explicitly defining it as encompassing planning, utilization, control, and supervision of national airspace, including delegated portions of international airspace. Rooted in the principle of state sovereignty (*asas kedaulatan*), the law mandates integrated civil-military coordination, empowers dynamic airspace reconfiguration in crisis scenarios, and introduces provisions for penalties, including criminal sanctions for violations involving unmanned aerial vehicles, drones, and near-space activities. It complements rather than supplants UU 1/2009, creating a hybrid regulatory framework that balances civilian safety with military operational imperatives (UU 21/2025, Articles 2 and subsequent provisions). By addressing previous legal vacuums, particularly in near-space governance, cross-sectoral authority, and enforcement mechanisms, UU 21/2025 provides the normative foundation for airspace to function as a strategic enabler of MDO.

From a defense perspective, UU 21/2025 directly supports MDO readiness by institutionalizing mechanisms for Flexible Use of Airspace (FUA) and Dynamic Airspace Management (DAM). These tools allow rapid transitions between civil and military control, facilitating the network-centric warfare concepts essential for achieving decision superiority in contested environments. The law explicitly recognizes the role of TNI AU in airspace defense, including investigative powers alongside Polri and PPNS, thereby embedding military considerations into peacetime and crisis governance. However, the transition from normative intent to operational reality reveals persistent legal-defense frictions. The continued dominance of safety-oriented frameworks under UU 1/2009 and ICAO standards creates regulatory disharmony, where civil authorities prioritize commercial efficiency while military stakeholders demand instantaneous sovereignty enforcement. Compounding this is the absence of implementing regulations, such as Government Regulations (PP) or Presidential Decrees (Perpres), that would operationalize the law's mandates for integrated command structures, data-sharing protocols, and joint civil-military procedures. Without these derivatives, UU 21/2025 risks remaining a "macan kertas" (paper tiger), unable to translate sovereign aspirations into tangible defense capabilities. These legal gaps manifest acutely in defense operational challenges. Institutional fragmentation persists across multiple stakeholders: TNI, Ministry of Defense, Ministry of Transportation, AirNav Indonesia, BSSN (cyber agency), and other entities. Sectoral ego and optional coordination mechanisms, rather than constitutionally binding obligations, generate "gray zones" of authority that erode command and control (C2) effectiveness. Data silos between military and civilian radar systems, particularly the two Flight Information Regions (FIRs) in Jakarta and Ujung Pandang, prevent real-time fusion essential for MDO's Common Operating Picture (COP). Interoperability remains hampered by disparate protocols, vendor-locked foreign technologies, and the absence of a national interoperability gateway. Dependence on full-stack foreign systems introduces vulnerabilities to embargo, sabotage, or backdoor exploitation, directly undermining technological resilience—a cornerstone of MDO doctrine. Operational readiness is further strained by manual transition procedures, insufficient joint simulations between air traffic controllers and TNI personnel, and competency

gaps in dynamic airspace management. The cumulative effect is heightened risk of fratricide, delayed responses in seconds-critical scenarios, and blind spots in national surveillance that adversaries could exploit.

Empirical insights from the Seskoau A-64 workshop corroborate these intertwined legal and defense deficiencies. Analysis of primary stakeholder perspectives reveals five interlocking root problems: (1) regulatory disharmony between UU 1/2009's safety focus and UU 21/2025's sovereignty emphasis, coupled with the lack of technical implementing rules; (2) organizational fragmentation across civil-military and multi-domain entities, perpetuating silo mentalities; (3) technological interoperability barriers and data silos that obstruct sensor fusion; (4) inadequate dynamic airspace management and personnel competencies, including limited joint training; and (5) heavy reliance on foreign technology that threatens data sovereignty and operational autonomy. These issues collectively impede the interoperability, command agility, and technological self-reliance required for credible MDO implementation. In defense terms, they erode the ability to achieve cross-domain convergence; in legal terms, they expose the incomplete translation of UU 21/2025's sovereign mandate into enforceable, integrated governance.

Similar challenges have been documented in broader MDO literature. Priebe et al. (2020) highlight legal and regulatory impediments to multi-domain command and control, including fragmented authorities and additional approval layers that slow cross-domain effects—mirroring Indonesia's civil-military regulatory gaps. Black et al. (2022) analyze multi-domain integration efforts across several nations and underscore persistent interoperability barriers and organizational silos as key obstacles to achieving convergence against near-peer threats. Gilli (2025) further emphasizes that successful MDO requires not only technological integration but also synchronized legal-policy frameworks and institutional redesign to overcome domain-specific stove-piping, a condition directly applicable to the post-UU 21/2025 implementation chasm in Indonesia.

The interplay between legal reform and defense transformation is thus holistic yet fragile. UU 21/2025 offers a robust normative scaffold for MDO by prioritizing sovereignty, cross-sector integration, and adaptive control, elements absent in prior fragmented regulations. Yet without addressing the implementation chasm, through derivative regulations, institutional redesign, system interoperability, human capital development, and indigenous technology, the law's potential as a defense enabler remains unrealized. This disconnect not only hampers Indonesia's air defense posture but also undermines broader national resilience against hybrid and multi-domain threats in a geopolitically volatile region. This study, therefore, seeks to bridge the identified legal-defense nexus by providing a factual assessment of MDO readiness post-UU 21/2025 enactment. Drawing on qualitative descriptive-analytical methods grounded in the Seskoau A-64 workshop data, it identifies strategic bottlenecks and formulates actionable implementation strategies utilizing the McKinsey 7S framework (shared values, structure, systems, style, staff, skills, and strategy). The ultimate objective is to deliver a phased, measurable roadmap with clearly delineated stakeholder roles, ensuring that legal advancements translate into operational defense superiority. By harmonizing policy, strengthening institutions, integrating network-centric systems, and achieving technological self-reliance, Indonesia can fully operationalize UU 21/2025 as the legal backbone of Multi-Domain Operations, thereby fortifying national airspace sovereignty and defense posture in the face of modern warfare complexities.

RESEARCH METHODS

This study employs a qualitative research approach with a descriptive-analytical design to examine the implementation strategy of Multi-Domain Operations (MDO) following the

enactment of Law No. 21 of 2025 on Airspace Management. According to Miles, Huberman, and Saldaña (2014), the descriptive-analytical approach in qualitative research is particularly suitable for complex social and policy phenomena because it enables researchers to systematically describe the current condition in detail while simultaneously conducting in-depth analysis to identify patterns, relationships, and underlying meanings. This method aligns with Creswell and Poth (2018), who emphasize that qualitative descriptive studies focus on presenting a comprehensive summary of real-world events as experienced and interpreted by participants, followed by analytical interpretation to derive practical insights. The qualitative approach was chosen because the integration of MDO concepts into national policy and airspace governance constitutes a complex, multidimensional phenomenon that cannot be adequately captured through quantitative metrics alone. Data were primarily obtained from the Seskoau A-64 workshop held as part of the Indonesian Air Force Command and Staff College program.

This workshop served as the main source of primary data through direct discussions, focus group inputs, and stakeholder deliberations involving senior TNI officers, policymakers from relevant ministries, and experts in defense, law, and airspace management. Additional supporting data were drawn from official documents, including Law No. 21 of 2025, Law No. 1 of 2009 on Aviation, relevant Government Regulations, ICAO standards, and strategic defense doctrines such as the U.S. Army Multi-Domain Operations 2028 and NATO's Multi-Domain Operations concepts. Data analysis followed the interactive model proposed by Miles, Huberman, and Saldaña (2014), which consists of three concurrent flows: data condensation (selecting, focusing, and simplifying the raw data from the workshop), data display (organizing information into matrices and narratives, such as the condition matrix and strategy matrix presented in this article), and conclusion drawing/verification (interpreting findings in relation to the McKinsey 7S framework and cross-checking with regulatory and doctrinal sources). This rigorous process ensures that the identified root problems and proposed strategies are grounded in empirical stakeholder perspectives while maintaining analytical depth.

Data collection was conducted through a combination of workshop documentation analysis, stakeholder perspectives, and literature review of primary and secondary sources. The workshop served as the main empirical source, providing real-world insights into the gaps between normative legal provisions and actual operational readiness in airspace management. Analytical techniques involved thematic analysis to identify recurring patterns and strategic issues, followed by a policy analysis framework to formulate recommendations. The McKinsey 7S organizational effectiveness model was adopted as the primary analytical lens to systematically map the interrelationships between strategy, structure, systems, shared values, style, staff, and skills in the context of MDO implementation. This framework enabled a holistic evaluation of both hard elements (strategy, structure, systems) and soft elements (shared values, style, staff, skills) required for successful policy execution. All findings were cross-validated through triangulation of workshop data, legal texts, and defense doctrine references to ensure reliability and depth of interpretation. Ethical considerations were maintained by focusing solely on publicly accessible workshop insights and official documents without disclosing classified information.

Table 1. Research Methods Overview

Method	Data Sources	Tools & Techniques	Analysis
Workshop Documentation Analysis	Seskoau A-64 workshop transcripts, stakeholder discussion notes, and recorded insights (2025–2026)	Workshop reports, audio recordings (if available), and manual note-taking	Thematic content analysis to identify root problems and strategic gaps
Legal and Policy Document Analysis	UU No. 21/2025 on Airspace Management, UU No. 1/2009 on Aviation, related PP/Perpres, ICAO	Systematic document review protocol, cross-referencing matrix	Content and policy gap analysis (regulatory disharmony and implementation barriers)

	standards, and national defense doctrines		
Doctrinal and Comparative Literature Review	US Army TRADOC Pamphlet 525-3-1 (2018), NATO Multi-Domain Operations (2025), Tolk & Muguira (2003) LCIM, Waterman et al. (1980) McKinsey 7S, Black et al. (2022)	Structured literature matrix, keyword mapping	Theoretical framework mapping and comparative synthesis with the Indonesian context
Stakeholder Perspective Synthesis	Inputs from senior TNI officers, policymakers (Kemhan, Kemenhub, AirNav, BSSN), and defense experts during the Seskoau A-64 workshop	Semi-structured discussion guides, group validation sessions	Triangulation of perspectives and identification of recurring strategic issues
Framework-Based Strategy Formulation	Identified root problems from workshop data	McKinsey 7S model application, phased roadmap design	Holistic alignment analysis (hard & soft elements) and program mapping
Cross-Method Triangulation	All data sources above (workshop, legal texts, doctrines, stakeholder inputs)	Manual coding, thematic matrices, researcher validation	Integrated thematic synthesis to ensure robustness and coherence of findings

Source: Processed by researcher using A-64 Workshop data (2026)

The qualitative data obtained from the Seskoau A-64 workshop documentation, legal and policy texts, doctrinal references, and stakeholder perspectives were systematically reviewed and subjected to thematic content analysis. Workshop insights served as the primary empirical foundation, while legal documents and defense doctrines provided normative and comparative benchmarks. The McKinsey 7S framework was applied as an analytical lens to map strategic alignment across hard and soft organizational elements. Triangulation across multiple data sources, combining workshop-derived root problems, regulatory gap analysis, and doctrinal comparisons, ensured the validity and depth of the identified challenges and proposed implementation strategies. This multi-source approach allowed for a comprehensive, context-specific assessment of MDO readiness within the legal framework of Law No. 21 of 2025.

RESULTS AND DISCUSSION

Result

Current Conditions of Airspace Management and Strategic Challenges in MDO Implementation Post-Enactment of Law No. 21 of 2025

The implementation of Multi-Domain Operations (MDO) in Indonesia’s national defense architecture, following the enactment of Law No. 21 of 2025 on Airspace Management, reveals a stark contrast between normative legal advancements and operational realities on the ground. Drawing directly from primary data generated through the Seskoau A-64 workshop, the analysis identifies five interlocking strategic root problems that collectively undermine the interoperability, command agility, and technological resilience required for credible MDO execution. These findings are synthesized in the following matrix, processed and validated by the researcher based on stakeholder inputs, doctrinal references, and legal-textual review.

Table 1. Condition Matrix (Facts, Subject Matter, and Implications Data)

No	Root of Questions (Data & Facts)	Strategic Problem Points	Implications (Impact If Left Unchecked)
1	Dominance of Law No. 1/2009 (Safety) vs the spirit of Law No. 21/2025 (Sovereignty). There is no PP/Perpres as an operational	Differences in Civil-Military Perspectives and Regulatory Gaps Derived	The emergence of doubts about the authorities in the field in making decisions. Without derivative regulations, the

	technical regulation. ICAO standards that are commercial-administrative in nature.	from Law 21/2025 in the Implementation of MDO.	mandate of Law 21/2025 becomes a "paper tiger" because the military lacks the operational legitimacy to take full control instantly.
2	The number of domain entities (Civil, TNI, Cyber, Kominfo). Inter-institutional sectoral egos. The coordination mechanism is still optional, not a constitutional obligation.	Organizational Fragmentation Across Entities/Airspace Management Domains, especially in the context of MDO.	The paralysis of the command and control system (Kodal) due to the "gray area" of authority. The combat speed of the MDO that demands seconds is hampered by bureaucratic blockades, so the defense response is always late.
3	The occurrence of "Data Silos" (separate radar and communication systems). Differences in data flow regulation standards between agencies. The military does not have automatic access to civilian radar data in the 2 FIRs.	Interoperability Barriers and Technology "Data Silos".	The occurrence of blind spots in national supervision. MDO's technology investment has become redundant because aerial intelligence data cannot flow legally and technically to the defense command center.
4	The procedure for air status transition is still manual & bureaucratic. The lack of joint simulation between ATC officers and TNI personnel. Differences in aircraft position plot data between radar systems.	Not Ready for Dynamic Airspace Management and Personnel Competence.	Fatal risk is in the form of a misshot (fratricide) or commercial aircraft accident in a conflict zone. Stuttering human resource coordination led to the failure of instant flight route separation in the midst of a crisis situation.
5	Reliance on foreign Full-Stack technology. Access to the source code is locked by an outside vendor. Vulnerabilities in encryption systems and non-standalone algorithms.	Technology Dependence and Data Independence.	The risk of digital sabotage, intelligence interception, and the threat of embargoes. The defense system can be instantly paralyzed if the producing country cuts off access to software when Indonesia's political position is not in line.

Source: Processed by researcher (2026)

The first root problem, "regulatory disharmony," stems from the persistent supremacy of Law No. 1 of 2009's safety-oriented paradigm over the sovereignty-driven spirit of UU 21/2025. While UU 21/2025 explicitly elevates airspace as a domain of national sovereignty (asas kedaulatan) and mandates integrated civil-military management (Articles 2, 3, and related provisions), the absence of implementing Government Regulations (PP) or Presidential Decrees (Perpres) leaves critical operational mechanisms, such as dynamic airspace reconfiguration, joint command protocols, and data-sharing obligations, unregulated. ICAO standards, which remain binding for civil aviation, further tilt the balance toward commercial-administrative priorities. This legal vacuum creates "gray zones" of authority that directly contradict MDO's requirement for instantaneous decision superiority (US Army, 2018). In defense terms, the inability to legally transition airspace control from civil to military authority within seconds undermines the entire OODA Loop (Observe-Orient-Decide-Act) that MDO doctrine demands. Workshop participants repeatedly highlighted that field commanders hesitate to exercise sovereign powers due to fear of legal repercussions under the older safety regime, effectively neutralizing the transformative intent of UU 21/2025.

The second problem, “organizational fragmentation,” arises from the multiplicity of domain entities (TNI AU, Kemhan, Kemenhub, AirNav Indonesia, BSSN, Kominfo) operating under optional rather than mandatory coordination mechanisms. Sectoral ego persists because coordination remains “budi baik” (goodwill-based) instead of constitutionally mandated. This directly violates the conceptual interoperability level in Tolk and Muguira’s LCIM model (2003), where systems must share not only data but also contextual understanding and assumptions about the battlefield. In MDO practice, such fragmentation results in command-and-control paralysis; a delay of even 30–60 seconds in contested airspace can forfeit the “window of superiority” essential for penetrating A2/AD environments (Black et al., 2022). The implication is catastrophic: Indonesia’s air defense posture remains reactive rather than proactive, exposing the archipelago to hybrid threats that exploit these bureaucratic seams.

Technological interoperability barriers constitute the third critical gap. “Silo data” between military and civilian radar systems, particularly the two FIRs in Jakarta and Ujung Pandang, prevents the creation of a unified Common Operating Picture (COP) that network-centric warfare requires (Department of Defense, 2001; Groh, 2009). Military operators lack automatic, real-time access to civilian radar feeds, while differing protocols and vendor-locked foreign systems block seamless fusion. This technological fragmentation directly contravenes MDO’s core principle of cross-domain convergence (NATO, 2025). The defense implication is the creation of persistent blind spots that adversaries can exploit through electronic warfare or cyber intrusion, rendering expensive MDO investments ineffective.

The fourth issue concerns dynamic airspace management and personnel competency. Transition procedures remain manual and bureaucratic, with minimal joint simulation between ATC and TNI personnel. Disparate data plots across radar systems further compound the problem. In a crisis, the inability to instantly reconfigure airspace status risks fratricide or civilian aircraft endangerment, scenarios that workshop stakeholders described as “unacceptable in modern warfare.” This competency gap prevents the realization of Flexible Use of Airspace (FUA) and Dynamic Airspace Management (DAM) explicitly enabled by UU 21/2025, thereby undermining the human dimension of MDO (Keller et al., 2020).

Finally, technological dependence on foreign full-stack solutions introduces existential risks to data sovereignty. Locked source code, non-indigenous encryption, and supply-chain vulnerabilities expose Indonesia to embargo, sabotage, or backdoor exploitation, threats that directly erode the technological self-reliance pillar of MDO (UK Ministry of Defence, 2020). If a supplier nation alters its geopolitical alignment, critical C2 systems could be rendered inoperable within hours, collapsing the entire multi-domain architecture. Collectively, these five root problems demonstrate that while UU 21/2025 provides a robust legal foundation, its implementation remains hampered by systemic legal-defense misalignment. The workshop data confirm that without immediate corrective action, Indonesia’s airspace management will continue to function as a collection of isolated silos rather than as the integrated enabler of MDO that modern defense doctrine demands. The cumulative operational risk is the erosion of decision superiority, increased vulnerability to hybrid threats, and the potential failure to translate sovereign legal mandates into battlefield effectiveness.

Discussion

Strategic Implementation Framework, Roadmap, and Stakeholder Engagement Using McKinsey 7S for MDO Readiness

To address the identified gaps, this study proposes a comprehensive implementation strategy anchored in the McKinsey 7S framework (Waterman et al., 1980). The model ensures alignment between hard elements (Strategy, Structure, Systems) and soft elements (Shared Values, Style, Staff, Skills), providing a holistic pathway to translate UU 21/2025 into operational MDO capability. The following matrix details the mapping of strategies to root problems, along with specific programs/sub-strategies.

Tabel 2. Strategy Matrix – Program

Problem Points	Strategy (McKinsey 7S)	Programs/Sub-Strategies
I. Differences in Civil-Military Perspectives & Regulatory Gap	Shared Values / Structure	Development of cross-domain doctrines; Culture of Sovereignty and Unity of Effort; Formation of CMAB (Civil-Military Airspace Board)
II. Organizational Fragmentation Across Entities	Structure (Struktur) / Style (Gaya Kepemimpinan)	C2 Cross-Domain Command Architecture Design; Development of Mission Command and Collaborative Leadership MDO Leadership Model
III. Interoperability Barriers & "Data Silos" Technology	Systems (Sistem) / Strategy (Strategi)	Digital Network-Centric Platform; Gateway Interoperability & Encryption Development; Convergence of Cross-Domain Capabilities
IV. Unpreparedness for Dynamic Airspace Management & HR Competencies	Skills (Keterampilan) / Staff (Staf)	Implementation of Dynamic Airspace Management (DAM); "Whole Force" Competency Standardization Program; Human Aspects Integration
V. Technology Dependency & Data Independence	(Strategy / Skills)	Resilience & Sustainability of MDO Technology; Cyber Proficiency Program & Standalone Software Development

Source: Processed by researcher (2026)

The McKinsey 7S application demonstrates rigorous alignment: Shared Values and Structure resolve regulatory and fragmentation issues; Systems and Strategy eliminate data silos and technological dependence; Skills and Staff address dynamic management and human capital gaps. Each element is interlinked—e.g., the Civil-Military Airspace Board (CMAB) under Structure simultaneously resolves regulatory disharmony (Problem I) and organizational fragmentation (Problem II) by creating a permanent clearing house with binding authority. To operationalize these strategies, a three-phase roadmap is proposed, ensuring measurable, time-bound execution:

Table 3. Roadmap for MDO Implementation Strategy within the Framework of Law No. 21 of 2025

Strategy / Timeframe	No	Program / Sub-Strategy	Responsible Entities	Key Performance Indicators (KPI)
Short-term (< 1 Year) Institutionalization Phase	1.1	Convergence of Cross-Domain Capabilities	Ministry of Defense, TNI AU, Ministry of Transportation	Issuance of Integrated MDO Doctrine; Reduction in reaction time; Validation of joint exercises
	1.2	Establishment of Permanent Cross-Domain Coordination Body (CMAB)	Coordinating Ministry for Political, Legal, and Security Affairs, Ministry of Defense, AirNav Indonesia	Issuance of regulatory framework for the body; Reduction in sectoral conflicts; Improved decision-making SLA
	1.3	Development of Interoperability Gateway and Encryption	National Cyber and Crypto Agency (BSSN), Air Force Communication Division, AirNav Indonesia	Cross-vendor compatibility achieved; Independent cryptography implemented; Zero data leakage incidents
	1.4	Development of Sovereignty Culture and Unity of Effort	Ministry of Defense, National Resilience Institute (Lemhannas),	Harmonization of derivative regulations; Compliance index

			Ministry of Transportation	achieved; Zero policy conflicts
	1.5	Development of MDO Command Leadership Model based on Collaborative Leadership	Echelon I/II Officials of Related Ministries and Agencies	Effectiveness of cross-sectoral orchestration; Utilization of integrated data; Zero sectoral ego
Medium-term (1–3 Years) Operationalization Phase	2.1	Technological Resilience and Self-Reliance	Ministry of Defense, National Research and Innovation Agency (BRIN), Defense Industry	80% of critical C2 system components use domestic encryption; Independent penetration testing conducted; Local supply chain ready for 24/7 support
	2.2	Development of Cross-Domain Command Architecture (C2)	TNI Headquarters, TNI AU, BSSN	100% system interoperability level; 50% reduction in command chain time (OODA Loop); System resilience against disruption
	2.3	Development of MDO Command Leadership Model based on Mission Command	TNI AU Leadership and Ministry of Transportation	Successful decentralization of decision-making; Field adaptability speed; Organizational trust level
	2.4	Whole Force Competency Standardization Program and Human Aspects Integration in MDO	Air Force Personnel Directorate, Ministry of Transportation Training Center	Joint civil-military competency certification; Standardized operational glossary; Zero communication errors; Sociopolitical training modules
	2.5	Implementation of Dynamic Airspace Management (DAM)	National Air Operations Command (Koopsudnas), AirNav Indonesia	Airspace status reconfiguration time < 15 minutes; Route diversion efficiency; System management interoperability
Long-term (> 3 Years) Actualization Phase	3.1	Development of Network-Centric Digital Platform	TNI AU, BSSN, PT Len	Real-time Common Operating Picture (COP) dashboard achieved; Data distribution speed; Automated identification
	3.2	Development of Cross-Domain Joint Doctrine	All Personnel and Related Ministries/Agencies	Full adoption and internalization of single doctrine (White Paper) at all command levels;

			Reduction in information latency; Effectiveness of joint exercises
3.3	Cyber Proficiency and Independent Software Development Program	BSSN, Defense Industry, TNI AU	Full self-reliance in security patching and C2 maintenance; Security gap detection and mitigation < 1 hour; Increased number of certified expert personnel

Source: Processed by researcher using Law No. 21 of 2025 (2026)

The roadmap is structured into three sequential phases to ensure systematic and measurable implementation of Multi-Domain Operations (MDO) under the legal framework of Law No. 21 of 2025. The Short-term phase (< 1 year) focuses on institutionalization, emphasizing the establishment of legal foundations, doctrine development, and permanent coordination mechanisms such as the Civil-Military Airspace Board (CMAB). The Medium-term phase (1–3 years) concentrates on operationalization through technical system integration, cross-domain command architecture, personnel competency standardization, and the initial implementation of Dynamic Airspace Management. Finally, the Long-term phase (> 3 years) aims at full actualization by achieving technological self-reliance, developing a network-centric digital platform, internalizing a unified cross-domain doctrine, and building advanced cyber capabilities. Each program is assigned to responsible entities with clear, measurable Key Performance Indicators (KPIs) to enable effective monitoring and evaluation. This phased approach ensures that regulatory harmonization, institutional strengthening, system interoperability, and human capital development are progressively realized, ultimately transforming the normative provisions of Law No. 21 of 2025 into operational defense superiority in multi-domain environments. The stakeholder role map and supporting matrix present a structured governance model that promotes synergy across institutions in executing the Multi-Domain Operations (MDO) roadmap under Law No. 21 of 2025. Four functional clusters are deliberately interconnected with the Civil-Military Airspace Board (CMAB) serving as the central coordinating hub. This design converts fragmented sectoral efforts into a unified command structure, clarifies accountability for each phase of implementation, and ensures that regulatory, operational, and technological responsibilities are aligned to achieve cross-domain interoperability and decision superiority.

PETA PERAN IDEAL PEMANGKU KEPENTINGAN IMPLEMENTASI MDO BERBASIS UU 21/2025

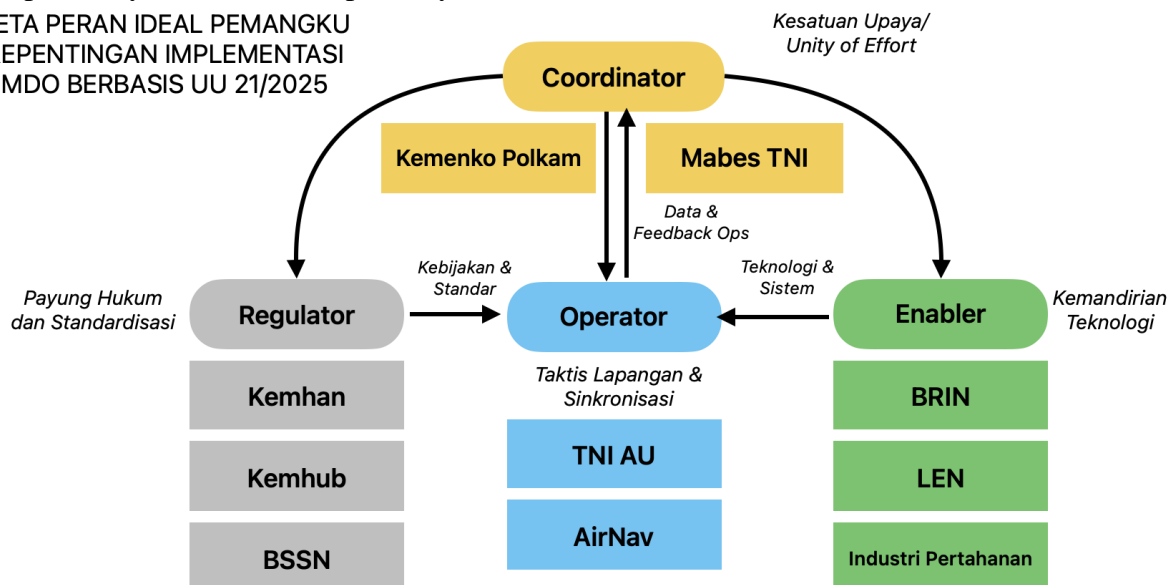


Figure 1. Stakeholder Role Map in the MDO Implementation Roadmap within the Framework of Law No. 21 of 2025

Referring to the stakeholder map above, the division of roles can be divided as follows:

1. **Coordinator.** It plays a role in ensuring that all entities move as one unit (*Unity of Effort*) to eliminate sectoral egos. Stakeholders at least include: the Coordinating Ministry for Political Affairs and the TNI Headquarters.
2. **Regulator.** It plays a role in ensuring that every step has a legal umbrella and standard security standards. Stakeholders at least include: the Ministry of Defense, the Ministry of Transportation, and BSSN.
3. **Operator/Executor (TNI AU, AirNav).** Plays a role in carrying out tactical functions in the field synchronously according to the division of airspace. Stakeholders at least include: TNI AU and AirNav.
4. **Enabler.** Its role is to provide technological advantages and tool independence so that operations do not depend on foreign parties. Stakeholders at least include: BRIN, LEN, and the national defense industry ecosystem as a whole.

Table 4. Matrix of Primary Stakeholder Roles in the MDO Implementation Roadmap within the Framework of Law No. 21 of 2025 Based on Program/Sub-Strategy

No	Program / Sub-Strategy	Responsible Entities	Primary Role
1.1	Convergence of Cross-Domain Capabilities	Kemhan, TNI AU, Kemenhub	Policy formulation for integrated defense regulation and tactical doctrine development
1.2	Establishment of Permanent Cross-Domain Coordination Body (CMAB)	Kemenko Polhukam, Kemhan, AirNav Indonesia	High-level coordination, mediation, and development of joint SOPs
1.3	Development of Interoperability Gateway and Encryption	BSSN, Diskomleka, AirNav Indonesia	Cyber security standard setting, technical integration, and data interface provision
1.4	Development of Sovereignty Culture and Unity of Effort	Kemhan, Lemhannas, Kemenhub	Promotion of national defense awareness and harmonization of derivative regulations
1.5	Development of MDO Command Leadership Model (Collaborative)	Echelon I/II Officials of Related Institutions	Elimination of bureaucratic barriers and cross-sectoral policy direction
2.1	Technological Resilience and Self-Reliance	Kemhan, BRIN, Defense Industry	Priority setting for local-content procurement and indigenous technology development
2.2	Development of Cross-Domain Command Architecture (C2)	Mabes TNI, TNI AU, BSSN	Design of joint command structure and protection of digital C2 infrastructure
2.3	Development of MDO Command Leadership Model (Mission Command)	TNI AU Leadership, Kemenhub	Delegation of decision-making authority to field commanders in emergencies
2.4	Whole Force Competency Standardization Program	Disminpersau, Pusdiklat Kemenhub	Career management and joint civil-military competency certification
2.5	Implementation of Dynamic Airspace Management (DAM)	Koopsudnas, AirNav Indonesia	Operational activation of military airspace and instant civil route diversion
3.1	Development of Network-Centric Digital Platform	TNI AU, BSSN, PT Len	Development and management of real-time Common Operating Picture (COP)

3.2	Development of Cross-Domain Joint Doctrine	All Personnel & Related Institutions	Full adoption and internalization of unified doctrine across all command levels
3.3	Cyber Proficiency and Independent Software Development	BSSN, Defense Industry, TNI AU	Curriculum development, certification, and internal software maintenance capability

Source: Processed by researcher using UU 21/2025 (2026)

The stakeholder role map and matrix illustrate a clear division of responsibilities designed to eliminate sectoral ego and ensure unity of effort in implementing Multi-Domain Operations under Law No. 21 of 2025. Four functional clusters, Coordinator, Regulator, Operator/Executor, and Enabler, are positioned with the Civil-Military Airspace Board (CMAB) as the central hub to facilitate seamless collaboration. This structure transforms optional coordination into mandatory joint action across short-, medium-, and long-term phases. By explicitly assigning primary roles to each institution according to its core mandates, the framework enhances accountability, reduces overlapping authorities, and accelerates decision-making processes essential for effective cross-domain operations. Arrow to the end of the discussion, the expanded analysis confirms that the strategic bottlenecks identified through workshop data are not insurmountable; they are addressable through the disciplined application of the McKinsey 7S framework and the phased roadmap. The synergy between strengthened legal instruments (UU 21/2025), institutional redesign (CMAB), technological integration (network-centric COP and interoperability gateway), and human capital development (Whole Force competency) will enable Indonesia to achieve full MDO readiness. Without this systematic, measurable, and sustainable approach, the sovereign potential embedded in UU 21/2025 will remain unrealized, leaving national airspace vulnerable in an era of multi-domain conflict. The proposed strategies, therefore, represent not only a policy solution but a doctrinal imperative for Indonesia's defense posture in the 21st century.

CONCLUSION

The enactment of Law No. 21 of 2025 on Airspace Management has provided a strong normative foundation for integrating airspace governance into Indonesia's national defense system, particularly in supporting the implementation of Multi-Domain Operations (MDO). However, the transition from legal provisions to operational readiness remains constrained by regulatory disharmony between civil safety priorities and military sovereignty requirements, institutional fragmentation, data silos, limited interoperability of command-and-control systems, and heavy dependence on foreign technology. These challenges, identified through the Seskoau A-64 workshop, highlight the critical need for systematic harmonization between legal mandates and defense operational demands. By applying the McKinsey 7S framework, this study proposes a comprehensive strategy encompassing shared values, organizational structure, integrated systems, leadership style, personnel development, skills enhancement, and clear strategic direction. The proposed three-phase roadmap, institutionalization (short-term), operationalization (medium-term), and actualization (long-term), along with the stakeholder role matrix centered on the Civil-Military Airspace Board (CMAB), offers a practical and measurable pathway to overcome existing gaps. When implemented consistently, this approach will enable the transformation of Law No. 21 of 2025 from a declarative policy into an effective enabler of cross-domain interoperability, dynamic airspace management, technological self-reliance, and decision superiority. Ultimately, the successful implementation of MDO within the framework of Law No. 21 of 2025 will significantly strengthen Indonesia's national air defense posture and enhance its ability to safeguard sovereignty in the face of modern multidimensional warfare threats.

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