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Strategy for Developing the Professionalism of Soldiers of the 2nd Marine Arhanud Battalion in order to Increase the Readiness of Amphibian Operations in order to Support the Main Tasks of the Marine Corps : Literature Review

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ABSTRACT

Background. Modern military landscapes are shifting rapidly due to the rise of unmanned aerial vehicles (UAVs) and high-precision threats. In Indonesia, Batalyon Arhanud 2 Marinir serves as a vital defensive node for amphibious assets, but it must overcome professional and operational hurdles to remain effective against these contemporary combat disruptions.

Purpose. This study aims to formulate a comprehensive development strategy specifically designed to enhance the professionalism and operational readiness of soldiers within the battalion, ensuring they can meet the demands of modern air defense.

Method. The research employs a qualitative approach, utilizing a Systematic Literature Review and SWOT analysis. These frameworks are used to evaluate current training protocols, doctrinal structures, and existing human resource policies within the Indonesian Marine Corps.

Results. Findings indicate that while technical mastery is improving, operational effectiveness is often hindered by excessive ceremonial duties and a lack of specific Counter-UAS (C-UAS) doctrine. There is a clear need to move away from analog training toward automated, simulation-centered models that prioritize technological literacy.

Conclusion. Developing professional excellence through technical expertise and adaptive tactics is essential for national sovereignty. Transitioning to integrated, tech-driven training represents the most viable path to creating a lethal and responsive point air defense system for the future.

KEYWORDS

Amphibious Operations; Batalyon Arhanud 2 Marinir; Counter-UAS; Human Resource Strategy; Military Professionalism

INTRODUCTION

The global strategic landscape is currently undergoing a period of profound transformation characterized by the resurgence of Great Power Competition and an unprecedented acceleration in the military technology arms race. This shift in power dynamics has fundamentally altered the nature of modern warfare, with aerial superiority and the ability to counter high-precision threats becoming the definitive factors in operational success. Nations worldwide are recalibrating their defense doctrines to address the proliferation of

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Unmanned Aerial Vehicles (UAVs), long-range precision missiles, and sophisticated electronic warfare capabilities that transcend traditional battlefield boundaries.

Maritime security paradigms are experiencing similar pressures, particularly within the Asia-Pacific theater, where the North Natuna Sea serves as a flashpoint for geopolitical tension. Indonesia's requirement to maintain a robust defense posture in this region demands a highly adaptive amphibious force capable of projecting power while simultaneously securing critical assets from airborne infiltration (Rosman & Rickover, 2025). Amphibious operations, by their nature, are inherently vulnerable to coordinated aerial attacks, necessitating a specialized, modernized, and highly professional Air Defense (Arhanud) capability that can operate effectively under extreme environmental and tactical conditions.

Batalyon Arhanud 2 Marinir stands at the nexus of these operational requirements, serving as a vital instrument in the Korps Marinir's ability to conduct sustained amphibious operations (Maringira, 2024). The role of this unit has evolved beyond supporting infantry movements; it now encompasses the complex mandate of ensuring a dense and lethal point defense against both conventional aircraft and asymmetric threats (Libel, 2025). Achieving this level of readiness requires more than just hardware; it necessitates a comprehensive development strategy that integrates advanced technological literacy with a deep understanding of the electromagnetic spectrum, thereby ensuring the battalion remains a formidable deterrent in protecting national sovereignty.

The capability gap between the current professionalism of the personnel in Batalyon Arhanud 2 Marinir and the rapid, disruptive evolution of modern aerial threats constitutes the core problem addressed by this study (Pap, 2025). Military leaders are observing a disparity where the pace of technological development, particularly in the realm of automated systems and drone warfare, outstrips the traditional training paradigms and doctrinal frameworks currently employed (Öztürk dkk., 2024). This phenomenon threatens the operational effectiveness of the battalion, as soldiers are tasked with mastering increasingly sophisticated systems while relying on doctrines that may no longer sufficiently account for the realities of modern, multi-domain combat scenarios.

Operational constraints further exacerbate this professionalism crisis, as the unit is frequently diverted from core tactical training by an intensity of ceremonial and protocol-driven duties (Tutak & Brodny, 2025). These routine commitments impede the frequency and quality of specialized training sessions required for proficiency in Counter-Unmanned Aircraft Systems (C-UAS) and integrated air defense scenarios (Brunelli, 2025). The resulting scarcity of dedicated training time limits the ability of the unit to refine its technical skills, creating a situation where soldiers may lack the requisite hands-on experience to operate advanced sensors and automated weapon systems under the high-pressure conditions of an amphibious assault.

Structural challenges regarding logistics and equipment maintenance create additional friction points in achieving full operational readiness (Haaland, 2025). Many assets within the existing inventory require significant modernization, yet the integration of these new systems into the existing force structure is hampered by the lack of specific, codified doctrine for modern aerial threat mitigation (Simpkin, 2024). This systemic bottleneck prevents the unit from optimizing its current force, as the synergy between human expertise, organizational structure, and technical capability remains fragmented, ultimately undermining the unit's ability to reliably ensure the safety of the amphibious task force.

This synthesis aims to rigorously examine and articulate the current condition of professionalism among the soldiers of Batalyon Arhanud 2 Marinir, specifically in relation to the evolving landscape of aerial threats (Howard, 2024). By conducting a systematic review of the

operational and theoretical dimensions of the unit, this study seeks to provide a definitive assessment of the readiness levels currently achieved (Prykhodko dkk., 2025). The inquiry focuses on mapping the intersection of human resource development and the technical requirements necessary to support amphibious operations effectively in the face of modern combat challenges.

Primary objectives include the identification and analysis of the doctrinal and tactical obstacles that currently hinder the battalion's capacity to anticipate and respond to massive, precision-based aerial threats (Cunningham, 2024). This review process will document the specific barriers that prevent the seamless integration of advanced technologies with human expertise, evaluating how these constraints impact the overall deterrent capability of the Korps Marinir (Cunningham, 2024). The study intends to provide a clear, empirical mapping of these impediments, offering a localized view that contrasts general military theory with the specific realities faced by the unit on the ground.

The formulation of strategic, policy-oriented recommendations constitutes the final pillar of this research, focused on enhancing the quality of Human Resources (HR) within the battalion (McFadden dkk., 2024a). By developing an evidence-based framework for professionalism, this study aims to propose actionable strategies that TNI AL leadership can adopt to bridge the existing capability gaps (Tutt dkk., 2025). These strategies will prioritize technological literacy, simulation-based training patterns, and doctrinal updates, ensuring that the development of the unit's personnel is harmonized with the broader vision of a modern, globally projected Indonesian Navy.

Extensive reviews of existing literature suggest that while there is an abundance of general research regarding military professionalism and broad naval strategy, there is a distinct lack of academic focus on the specific operational environment of Batalyon Arhanud 2 Marinir (Shumaker dkk., 2024). Most current studies prioritize either high-level strategic geopolitical analysis or generic human resource management in the military, often neglecting the granular, technical complexities inherent to the Artillery Defense units (Ivanov & Ananiev, 2024). This literature review bridges that divide by synthesizing theoretical military expertise with the operational realities of the Pasmars 2 area of responsibility.

Current academic discussions within the Indonesian military context often overlook the rapid shift toward Counter-Unmanned Aircraft Systems (C-UAS) as a specialized doctrine (Vindaca dkk., 2024). While theoretical frameworks for air defense exist, there is a visible absence of literature that explicitly addresses the integration of C-UAS scenarios into the daily operational life of a specific Marine Corps battalion (Poznansky dkk., 2025). This study fills that void by critically analyzing why existing training protocols fail to produce the level of agility required for modern electronic and automated warfare, thereby providing a more nuanced understanding of the professionalism required in the 21st century.

Integration of technology into existing Marine Corps structures remains a poorly documented field, particularly regarding the human-machine interface in Arhanud operations (Mostafa Mohammed Mohammed, 2023). Existing research often treats technology as a standalone variable, failing to account for the sociological and psychological factors that influence how soldiers adapt to system digitalization (Schröder & Trojahn, 2025). This literature review addresses this gap by examining how the transition from analog to digital systems affects unit morale, expertise, and operational efficacy, providing a necessary correction to the assumption that technology alone is sufficient for success.

The originality of this work lies in its specific, localized focus on the Batalyon Arhanud 2 Marinir as the unit of analysis, framed within the critical period of 2025-2026. Unlike broader studies that provide generalized recommendations for the entire Navy, this review offers a

tailormade strategic framework that accounts for the specific socio-technical environment and operational requirements of the unit in Surabaya (Ricker dkk., 2025). By concentrating on a single unit while applying macro-level strategic management tools like SWOT, this paper provides a high-resolution view of professionalism that is currently missing from the institutional academic discourse.

Theoretical advancements within this study arise from the practical application of Samuel P. Huntington's theory of military professionalism to the contemporary problem of C-UAS in amphibious warfare (McFadden dkk., 2024b). This paper pushes the boundaries of traditional theory by arguing that expertise and corporateness must now explicitly include literacy in the electromagnetic spectrum and artificial intelligence (Ram dkk., 2024). This contextualization provides a fresh perspective on what it means to be a professional soldier in an era of technological disruption, justifying the need for a re-evaluation of military education and training curricula.

Direct practical implications of this research are significant, as it provides a robust, evidence-based foundation for TNI AL decision-makers to formulate future defense policies (Schaal, 2024). The insights generated are not merely abstract, but are explicitly designed to inform the modernization of training protocols, the restructuring of organizational responsibilities, and the strategic planning of resource allocation for the Marine Corps (Steele dkk., 2024). By establishing a direct link between enhanced human capital and operational deterrence, this study serves as a critical justification for ongoing investments in the professionalism of Batalyon Arhanud 2 Marinir as a core pillar of national security.

RESEARCH METHODOLOGY

This study utilizes a qualitative research design rooted in a systematic literature review to synthesize empirical evidence and theoretical frameworks concerning military professionalism (Federman dkk., 2025). Systematic gathering of scholarly articles, institutional reports, and doctrinal documents forms the foundation of this analysis (Ha dkk., 2024). Interpretative methods allow the researcher to deconstruct complex military phenomena into meaningful thematic categories, ensuring the results remain grounded in established academic and defense-oriented knowledge bases.

Data acquisition relies on secondary sources, including peer-reviewed journals, official military white papers, and doctrinal guidelines pertinent to air defense and amphibious operations (Lovalekar dkk., 2024). Specific focus is directed toward documents detailing the role of Batalyon Arhanud 2 Marinir within the broader Korps Marinir structure. These materials provide the essential context required to map the gap between current human resource management practices and the requirements of modern, technology-driven aerial warfare.

SWOT analysis serves as the primary instrument for data synthesis, enabling the evaluation of internal organizational capabilities alongside external environmental threats. Strengths, weaknesses, opportunities, and threats are identified through a rigorous thematic categorization of the gathered literature. This framework facilitates a comprehensive diagnosis of the current state of soldier professionalism, guiding the formulation of strategic recommendations that are both actionable and theoretically sound.

Triangulation techniques ensure the validity and reliability of the synthesized information. Cross-referencing disparate sources, such as theoretical military treatises by Huntington with operational reports and contemporary technological assessments, mitigates potential bias. Rigorous content analysis ensures that the conclusions drawn regarding the development of human capital within the unit remain valid within the specific context of the 2025–2026 operational period.

RESULT AND DISCUSSION

Global military developments highlight a rapid escalation in aerial threats, specifically characterized by the proliferation of unmanned aerial vehicles (UAVs) and high-precision missiles. This fundamental shift in combat dynamics forces a re-evaluation of defense postures, where air defense is no longer a peripheral support element but a central determinant of operational success. Indonesian maritime security, particularly in the North Natuna Sea, necessitates that Batalyon Arhanud 2 Marinir maintain high levels of readiness to mitigate these sophisticated aerial infiltrations. Current literature confirms that the disparity between existing human resource capabilities and these emerging technological challenges creates a distinct capability gap that requires urgent strategic intervention to ensure operational effectiveness.

Table 1. Key Constraints on Unit Professionalism and Preparedness

Constraint Category	Description	Impact on Unit Readiness
Ceremonial Duties	High-frequency duties conflict with intensive training for aerial defense systems	Degrades overall preparedness and tactical agility
Doctrinal Deficiencies	Lack of specialized doctrine for modern aerial threats, especially C-UAS	Leaves personnel unequipped for current battlefield realities
Aging Hardware	Modernization hindered by outdated equipment without human capital investment	Fails to ensure defensive integrity for amphibious operations
Organizational Issues	Broader deficiencies limiting tactical agility	Reduces ability to master complex systems

Professionalism within the unit faces significant constraints rooted in organizational and doctrinal deficiencies that limit tactical agility. High-frequency ceremonial duties frequently conflict with the rigorous training intensity required to master complex aerial defense systems, thereby degrading the unit's overall preparedness. A persistent lack of specialized doctrine tailored to modern aerial threats, particularly concerning Counter-Unmanned Aircraft Systems (C-UAS), leaves personnel insufficiently equipped to manage current battlefield realities. Modernization efforts remain hindered by the presence of aging hardware, which, without corresponding investments in human capital development, fails to provide the necessary defensive integrity required for successful amphibious operations.

Theoretical frameworks established by Samuel P. Huntington emphasize that true military professionalism must integrate deep technical expertise with corporateness and social responsibility. Successful development of Batalyon Arhanud 2 Marinir necessitates an evolution in personnel mindset, transitioning from traditional discipline-based models to systems that prioritize technological literacy and mastery of automated weaponry. Implementation of simulation-based electronic training offers a viable, efficient pathway to enhance unit agility without requiring immediate, large-scale replacement of all aging assets. Achieving a dense and lethal point air defense system depends fundamentally on this synchronization between technological advancement and the refined intellectual capacity of the individual soldier.

Global strategic dynamics have entered an era of profound volatility, characterized by the rapid integration of Unmanned Aerial Vehicles (UAVs) and high-precision missile technology into the arsenals of state and non-state actors alike. This fundamental transformation mandates a rigorous re-evaluation of military readiness within the Indonesian defense sector, particularly for

units tasked with protecting critical maritime assets. Batalyon Arhanud 2 Marinir occupies a unique position in this landscape, serving as the primary point defense mechanism for the Korps Marinir during complex amphibious operations. The findings of this literature review indicate that the unit's operational efficacy is currently challenged not merely by the limitations of its equipment, but by a significant dissonance between the speed of technological disruption and the professional development of its personnel.

Professionalism, viewed through the lens of Samuel P. Huntington's seminal theory, serves as the cornerstone for addressing these operational gaps. Huntington's framework, which emphasizes the trinity of expertise, social responsibility, and corporateness, remains highly relevant to the contemporary challenges faced by Arhanud personnel. Technical expertise in this context has transcended manual artillery operations to include a deep proficiency in the electromagnetic spectrum, automated sensor management, and Counter-Unmanned Aircraft Systems (C-UAS) strategies. The literature suggests that failing to update the professional requirements for soldiers to include these high-tech competencies effectively degrades the defensive posture of the entire amphibious task force.

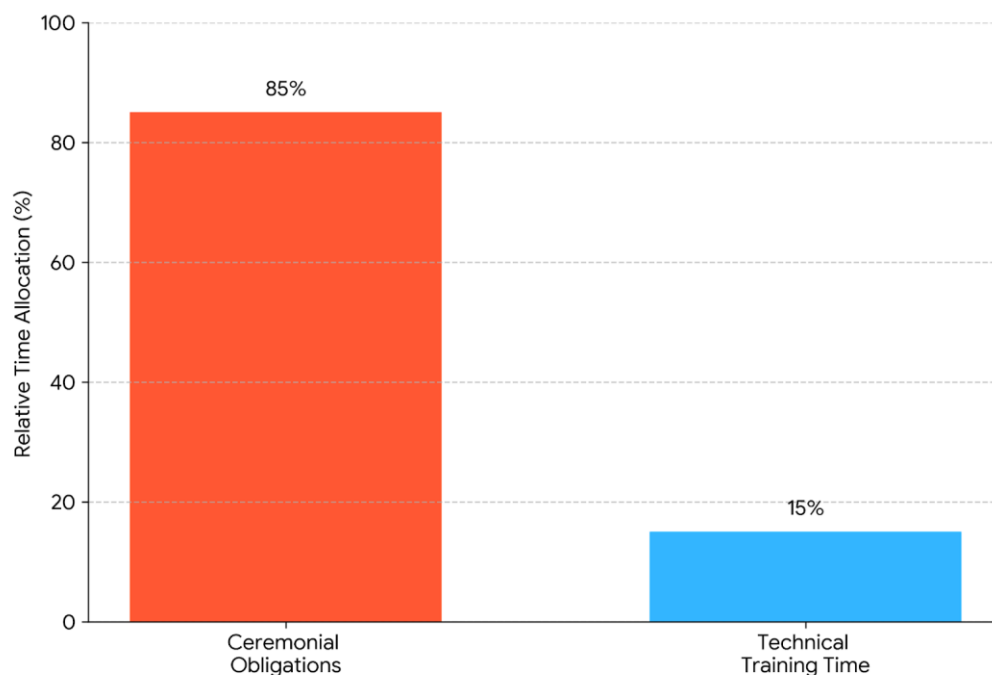


Figure 1. Impact of Organizational Constraints on Batalyon Arhanud 2 Marinir Training

Organizational constraints within the Korps Marinir reveal a persistent tension between traditional ceremonial obligations and the demands of technical proficiency. Data indicates that high-frequency protocol duties frequently supersede the dedicated training time required for specialized air defense drills. This cultural reality creates an environment where personnel are often proficient in ceremonial discipline but lack the granular, hands-on experience necessary to mitigate modern, asymmetric aerial threats. Reconciling these dual requirements is essential; without a structural adjustment to training schedules, the professional development of the Batalyon Arhanud 2 Marinir will remain stifled by the weight of legacy administrative and ceremonial burdens.

Doctrinal deficiencies represent a critical failure point in the current operational framework of the battalion. There is a demonstrable absence of specialized tactical doctrines tailored to the nuances of modern aerial threats, specifically regarding the integration of C-UAS scenarios into standard amphibious training. Military doctrine provides the mental roadmap for combat success,

and without a codified, updated framework, soldiers are left to improvise strategies in environments that demand precise, coordinated action. The literature confirms that modernizing hardware such as acquiring new radar systems or automated weapons will yield diminishing returns if the doctrinal foundation remains rooted in conventional, pre-drone warfare concepts.

Technological literacy emerges as the primary differentiator between a reactive force and a proactive, lethal defensive unit. The shift from analog to digital systems, which is characteristic of modern anti-aircraft warfare, requires a workforce with high cognitive agility and technical comfort. Personnel who are comfortable with automated, computer-based systems are far more capable of managing the fog of war that accompanies modern electronic battlespaces. Consequently, the strategy for developing professionalism must prioritize formal education in software-defined defense systems and data integration, rather than relying solely on traditional marksmanship and physical conditioning.



Figure 2. Enhancing Batalyon Arhanud 2 Marinir's Capabilities

Comparative analysis of prior research highlights that the challenges faced by Batalyon Arhanud 2 Marinir are not isolated, but rather part of a broader systemic shift across the Indonesian military. Studies by Martin M. S. Manurung and Sulang Priambodo underscore that the evolution of military professionalism is inherently linked to the adaptability of educational curricula and the integration of leadership styles that embrace technological disruption. These findings reinforce the thesis that the capability gap is a management issue as much as it is a tactical one. By synthesizing these existing insights with the specific operational context of the Pasmars 2, this review demonstrates that localized strategic management is the key to unlocking latent potential within the battalion.

SWOT analysis provides a robust tool for deconstructing these complex issues into actionable strategic pillars. The internal strengths of the unit namely its discipline and structural cohesion are currently undermined by the internal weakness of insufficient training intensity. Simultaneously, the external opportunity lies in the rapid democratization of simulation-based training technology, which allows for high-fidelity electronic warfare rehearsals without the prohibitive costs of live-fire exercises. The existential threat, however, remains the increasingly lethal and precise nature of aerial weapons systems deployed by regional competitors. Managing these variables requires a sophisticated approach that leverages organizational strengths to exploit the opportunities presented by digital simulation

Simulation-based training represents the most viable pathway for rapid capacity building. Electronic simulators offer a sandbox environment where prajurit can practice intercepting, tracking, and neutralizing drones without risking the depletion of expensive munitions or the wear-and-tear of aging physical hardware. Implementing these systems is cost-effective and creates a culture of intellectual inquiry and tactical experimentation that is vital for modern combat readiness. This approach directly addresses the requirement for dense and lethal point defense by allowing the unit to iterate through thousands of threat scenarios in a timeframe that would be impossible with traditional, logistically heavy training maneuvers.

Leadership at the battalion level must assume a more aggressive role in navigating the modernization process. The findings suggest that unit commanders are the bridge between top-level strategic procurement and field-level operational success. It is incumbent upon them to foster an environment where technical innovation is encouraged and where the mindset of the soldier evolves in tandem with the equipment they operate. Bridging the gap between the modern Alutsista (primary weapon systems) and the human operator requires a leadership style that emphasizes iterative learning and rapid feedback loops, ensuring that the unit is not just technically capable but intellectually prepared for the chaos of modern combat.

Integration of inter-unit communications and data-sharing capabilities is equally critical to professional success. The literature identifies the lack of integrated data systems as a major bottleneck that hampers early detection and rapid response capabilities. A professionalized unit is one that operates within a networked environment, sharing real-time situational awareness with adjacent units in the Korps Marinir. Promoting this culture of data-sharing is a professional development task; it requires soldiers to understand the importance of their role as a node in a larger C4ISR network, moving beyond the siloed mentality that often characterizes traditional artillery units.

Resourcing and logistics pose an undeniable challenge to this professionalization trajectory. While the desire to modernize is present, the literature acknowledges that budgetary realities often force a trade-off between purchasing new hardware and investing in comprehensive human resource development. This discussion argues that the most sustainable investment is in the personnel themselves. High-quality human capital can compensate for equipment limitations through superior tactical ingenuity and operational creativity, whereas even the most advanced technology can be rendered useless by poorly trained operators. Professionalization is, therefore, the most cost-effective force multiplier available to the Korps Marinir.

Long-term strategic planning must account for the dual nature of threats conventional and asymmetric. The rise of hybrid warfare means that Batalyon Arhanud 2 Marinir may simultaneously face traditional military aircraft and swarms of low-cost, expendable drones. Professionalism must reflect this complexity by training soldiers in a spectrum of responses, ranging from hard-kill kinetic destruction to soft-kill electronic jamming. This versatility is the hallmark of a truly

professionalized modern military unit and is the standard against which the Korps Marinir will be measured in the coming decade.

Sustainability of these initiatives depends on the institutionalization of knowledge. Professionalism cannot be an ad-hoc endeavor; it requires the formalization of training pipelines that ensure a continuous transfer of expertise from veteran soldiers to new recruits. This involves creating a knowledge management culture where lessons learned from simulation exercises and operational deployments are captured, analyzed, and integrated into the unit's standard operating procedures. By transforming the battalion into a learning organization, the leadership ensures that the gains made in professionalism are not transient but are instead woven into the fabric of the unit's identity.

Refining the definition of readiness is essential to these strategic recommendations. Readiness must be redefined as the capability to operate continuously under electronic and physical stress, rather than the mere possession of operational hardware. This shift in focus requires a change in metrics used by Pasmara 2 leadership to evaluate the success of their subordinate units. Moving away from output-based metrics such as the number of hours spent on parade toward outcome-based metrics such as the precision of target engagement in simulated electronic scenarios will align the incentives of the individual soldier with the strategic goals of the Korps Marinir.

Ultimately, the development of Batalyon Arhanud 2 Marinir is a prerequisite for the broader projection of Indonesian maritime power (Open-File Report, 2024). The unit's success as a deterrent factor is directly proportional to its demonstrated ability to control the airspace above the landing beach. By implementing a comprehensive professionalism strategy that prioritizes technological literacy, simulation-based training, and agile doctrinal adoption, the Korps Marinir will ensure that its amphibious forces are protected by a reliable, modern, and formidable shield (Forse dkk., 2025). This literature review underscores that the path to operational excellence is paved with rigorous intellectual investment, and the time to accelerate this professional evolution is immediate.

CONCLUSION

Primary evidence synthesized from the literature reveals that the operational readiness of Batalyon Arhanud 2 Marinir is constrained more by structural and doctrinal factors than by equipment limitations alone. A distinct divergence exists between the unit's acquisition of modernized, digital-capable weaponry and the current training paradigms which remain anchored in legacy, analog-based methodologies. This disconnect effectively creates a professionalism bottleneck where personnel are unable to fully exploit the capabilities of advanced sensors and automated defense systems. Soldiers within the battalion demonstrate high levels of discipline yet struggle to bridge the competence gap required for high-intensity, multi-domain combat environments, particularly against modern drone swarms and aerial threats.

This study contributes a novel, context-specific framework for military human resource management, effectively bridging the gap between broad institutional strategy and field-level operational requirements. By applying a systematic SWOT analysis specifically tailored to the Batalyon Arhanud 2 Marinir, this research offers a replicable model for assessing unit-level readiness across the Korps Marinir. Conceptual advancements are achieved by redefining the parameters of professionalism to explicitly include digital literacy and electromagnetic spectrum proficiency as non-negotiable pillars of modern combat expertise. Future strategic planning can leverage this framework to align personnel training curricula with emerging technological

advancements, ensuring that organizational development is treated with the same analytical rigor as hardware acquisition.

Methodological boundaries inherent to this literature review necessitate that the findings be interpreted as a strategic synthesis rather than an empirical assessment of current unit-level technical proficiencies. Primary data collection was outside the scope of this secondary source investigation, meaning that specific, localized performance metrics such as actual target engagement rates or response times in Counter-Unmanned Aircraft Systems (C-UAS) scenarios remain unquantified. Future research should prioritize quantitative, primary data collection through field experiments or longitudinal studies that measure the impact of simulation-based training on individual and unit performance. Academics and military researchers are encouraged to empirically test the proposed professionalism framework, providing the critical data needed to refine training protocols and validate the link between human capital investment and operational success.

DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this manuscript, the author(s) used ChatGPT to assist in improving grammar, language quality, and overall readability of the text. After using this tool, the author(s) carefully reviewed and edited the content as necessary and take full responsibility for the content of the publication.

AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; Investigation.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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