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AIMS AND SCOPE

The Journal of Defence and Security is a publication of the Malaysian Institute of Defence and Security, MiDAS. The journal publishes original papers and reviews covering all aspects of defence and security. It is a platform to promote awareness on the capabilities and requirements of modern defence & security technologies and policies, covering topics in the areas of, but not limited to, Evolution of Military Information & Communication Systems, Smart Weapons, Modern Vehicle & Aerospace Engineering Challenges, Intelligence, Surveillance & Reconnaissance, Biological & Chemical Terrorism Countermeasures, Personnel Protection & Performance, Military Medicine, Emergent Naval Technology, and Defence & Security Strategic Management.

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COLLABORATIVE GOVERNANCE FOR SUSTAINABLE DEVELOPMENT AND MARINE RESOURCES MANAGEMENT IN MALAYSIA

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ABSTRACT

Malaysia, with its extensive coastline stretching over 4,675 kilometres, boasts a wealth of marine resources critical for economic growth and societal well-being. However, the sustainable management of these resources has become increasingly complex due to environmental threats, overexploitation, and the need to strike a balance between economic development and ecological conservation.

Collaborative governance is a multifaceted approach that involves cooperation, coordination, and shared decision-making among diverse stakeholders to address complex public policy issues. In the context of marine resource management, it brings together government agencies, non-governmental organizations (NGOs), local communities, and other relevant actors to collectively work towards the sustainable use and conservation of marine resources.

The complexity of marine resource management, with its interdependencies between ecological, economic, and social systems, makes collaborative governance crucial. Moreover, it aligns with the principles of sustainable development, balancing economic growth with environmental conservation and social equity.

While Malaysia's marine resources are abundant, the country faces challenges such as a complex legal and institutional framework, coordination and communication issues, disputes over resource ownership, and the need for capacity building. Thus, including the rich biodiversity of Malaysia's marine ecosystems, existing initiatives like marine protected areas and community-based management, cultural diversity supporting collaboration, and Malaysia's commitment to international agreements on marine conservation.

Government agencies at the federal and state levels, such as the Department of Fisheries and the Department of Marine Parks Malaysia, play central roles. NGOs, including WWF-Malaysia and Reef Check Malaysia, provide expertise and support, while local communities contribute traditional knowledge.

Collaborative governance offers numerous benefits for Malaysia, including enhanced ecosystem resilience, economic growth through sustainable practices, social equity by sharing benefits with local communities, an improved international reputation for commitment to conservation, and adaptability to climate change impacts.

The success stories from various regions underscore the potential for collaboration to empower local communities, protect marine ecosystems, and contribute to the overall well-being of Malaysia's coastal regions. As the nation faces ongoing challenges in marine resource management, collaborative governance stands out as a beacon of hope for a resilient and sustainable future.

INTRODUCTION

Collaborative governance has emerged as a promising approach to address complex environmental challenges, such as sustainable development and marine resources management (Stakeholder Engagement Science and Practice (Institute for Sustainable Agricultural, Food, and Environmental Science (SAFES)), n.d.). Marine resources are invaluable assets to any nation, particularly for those with vast coastlines like Malaysia. These resources, which include fisheries, aquaculture, and biodiversity, are essential to the nation's social and economic development. In Malaysia, a country blessed with abundant marine resources, the need for effective governance mechanisms becomes paramount (Chee et al., 2021a). However, the sustainable management of marine resources has become increasingly challenging due to environmental threats, overexploitation, and the need to balance economic development with ecological conservation. Collaborative governance has emerged as a promising approach to address these complex issues and ensure the sustainable development of marine resources in Malaysia.

This subtopic aims to explore the concept of collaborative governance and its relevance in the context of sustainable development and marine resource management in Malaysia. This will delve into the concept of collaborative governance, its importance in the context of marine resource management, and its practical application in Malaysia. We will explore the challenges and opportunities of implementing collaborative governance in Malaysia, highlighting successful case studies and key stakeholders involved in this process. Furthermore, we will discuss the potential benefits of this approach for sustainable development and marine resource management in Malaysia.

Malaysia's diverse marine ecosystems face numerous threats, including overfishing, pollution, habitat destruction, and climate change impacts. These challenges require multi-stakeholder collaboration involving government agencies, local communities, non-governmental organizations (NGOs), and industry players (Reviving Ocean Health Through Regional Cooperation, n.d.). By engaging different stakeholders in decision-making processes, collaborative governance can facilitate knowledge sharing, foster consensus-building, and promote transparency and accountability while ensuring sustainable outcomes (Florini, 2018).

Understanding Collaborative Governance Collaborative governance is a multifaceted approach that involves cooperation, coordination, and shared decision-making among various stakeholders to address complex public policy issues. In the context of marine resource management, it brings together government agencies, non-governmental organizations, communities, and other relevant actors to work collectively towards the sustainable use and conservation of marine resources.

THE IMPORTANCE OF SUSTAINABLE DEVELOPMENT AND MARINE RESOURCES MANAGEMENT IN MALAYSIA

Sustainable development is an approach that aims to meet human development goals while also enabling natural systems to provide necessary natural resources and ecosystem services to humans (Wikipedia contributors, 2023). Collaborative governance aligns with the principles of sustainable development, balancing economic growth with environmental conservation and social equity. It helps to ensure that the benefits of marine resource management are distributed equitably among various stakeholders.

Marine resource management is an important aspect of sustainable development. Marine resource management is inherently complex due to the interconnectedness of ecological, economic, and social systems. Collaborative governance enables a holistic approach that considers these interdependencies, allowing for more efficient and sustainable decision-making. Malaysia is located in the Indo-Pacific region with coasts bordering the Andaman Sea, the Straits of Malacca and Singapore, the Gulf of Thailand, the South China Sea, the Sulu Sea, and the Sulawesi Sea (Bee et al., 2023). The country has a rich marine biodiversity and its marine resources play a crucial role in its economy.

Sustainable development and effective management of marine resources are crucial for the socio-economic growth and environmental well-being of Malaysia (The 12th Malaysia Plan: Advancing Sustainability | United Nations Development Programme, n.d.). As a nation blessed with extensive coastal areas, rich biodiversity, and abundant marine resources, Malaysia recognizes the significance of preserving its marine ecosystems (Salman et al., 2021). Sustainable development ensures that present generations meet their needs without compromising the ability of future generations to meet theirs (Malaysia's Water Vision: The Way Forward - the Malaysian Water Partnership, n.d.).

Federal and state-level agencies, such as the Department of Fisheries and the Department of Marine Parks Malaysia, play a central role in marine resource management. Their involvement is essential for creating policies, regulations, and management plans. Hence, it entails adopting responsible practices that balance economic activities with environmental protection. By promoting sustainable fishing methods, reducing pollution, and conserving marine habitats, Malaysia aims to safeguard its valuable coastal ecosystems (Chee et al., 2021b). To ensure the protection and sustainable use of seas and marine resources, the Malaysian government formulated the "National Policy on Biological Diversity 2016–2025" and has resolved to increase total terrestrial areas by 20% and marine territories by 10% by 2025 (Masud, 2019).

Environmental and conservation organizations, like WWF-Malaysia and Reef Check Malaysia, work closely with local communities and government agencies to provide expertise, support, and advocacy for marine resource management. WWF-Malaysia advocates for Malaysia's commitment to conserve 30% of Malaysia's seas and coasts, for the benefit of nature, livelihoods, businesses, and future generations (Marine 2, n.d.). Furthermore, effective governance in managing marine resources is vital to ensure equitable distribution and sustainable utilization.

In Malaysia, indigenous and coastal communities have centuries of experience in managing their coastal resources sustainably. Local communities often possess valuable knowledge about the marine environment, which can be harnessed through collaborative governance. Engaging local communities and other stakeholders in the management process can enhance compliance with regulations and increase the effectiveness of enforcement efforts. Collaborative governance involving various stakeholders such as government agencies, local communities, scientists, and non-governmental organizations is essential for successful implementation (Johnstone & Vaghefi, 2019). It is effective in achieving sustainable development outcomes (Fava, 2022).

CHALLENGES FACED IN COLLABORATIVE GOVERNANCE FOR SUSTAINABLE DEVELOPMENT AND MARINE RESOURCES MANAGEMENT IN MALAYSIA

Collaborative governance for sustainable development and marine resources management in Malaysia faces several challenges that hinder effective implementation. Malaysia's vast coastline, which extends over 4,675 kilometres, offers a wealth of marine resources, making it crucial for the country's economy and food security. Marine protected areas (MPAs) in Malaysia are significantly constrained by a host of problems and challenges such as ineffective management, poor institutional capacity, limited enforcement, absence of awareness, and poor socioeconomic status (SES) which influence the conservation of marine resources (Masud, 2019). MPA's problems are a reflection of the challenges in collaborative governance and marine resource management.

Furthermore, overfishing, habitat deterioration, and the effects of climate change have all posed obstacles to the sustainable management of these resources. In addition, collaborative governance may also encounter various prevalent challenges, such as insufficient trust and communication among stakeholders, divergent interests and objectives, constrained financial resources and capacity, inadequate public awareness or political determination, and deficient legal and institutional frameworks (General, 2022).

Firstly, Malaysia's marine resource management is governed by a complex web of laws and regulations. Aligning these regulations and creating a coherent legal framework for collaborative governance can be a formidable task. The lack of political will has amplified exercises to overcome inadequate legal instruments and institutional framework. A good and effective legal instrument and framework at least minimises overlapping function and jurisdiction.

Secondly, the lack of trust and communication among various stakeholders is a significant obstacle. Efficient communication and coordination among diverse stakeholders, including government agencies at the federal and state levels, can be challenging. Ensuring that all parties work together harmoniously is essential for successful collaborative governance. Conflicting interests and goals across various agencies, governmental authorities, and local communities frequently resulted in fragmented efforts and inefficient decision-making procedures. The cooperative management of maritime resources can also be hampered by conflict and conflicts over resource ownership and access rights, especially in places where local communities and commercial interests clash.

Thirdly, limited financial resources pose a challenge to collaborative governance initiatives (Mohd Zaideen, 2020; Gao et al., 2023). Insufficient funding hampers the implementation of comprehensive policies, programs, and projects aimed at sustainable development and marine resource management.

Fourth, inadequate institutional capacity and expertise hinder effective collaboration between government agencies, non-governmental organizations (NGOs), academia, and other relevant stakeholders (Integrated Management of Coastal Zones, n.d.). Numerous local communities and non-governmental organisations may face limitations in terms of resources and experience, which might hinder their ability to effectively engage in collaborative governance initiatives. Building capacity through training programs can help overcome this challenge.

Fifth and finally, the lack of awareness and understanding among the public about the importance of sustainable development exacerbates the challenges faced in collaborative governance (3. Environmental Management and Sustainable Development in Malaysia, Danish Environmental Protection Agency, n.d.). Without active engagement from communities and individuals, it becomes difficult to achieve meaningful progress towards sustainable practices.

OPPORTUNITIES IN COLLABORATIVE GOVERNANCE

The maritime ecosystems in Malaysia exhibit a remarkable level of diversity, encompassing various habitats such as coral reefs, mangroves, and seagrass beds. Protecting and managing this rich biodiversity is critical for the country's environmental sustainability and economic resilience.

Malaysia has already taken steps toward implementing collaborative governance in marine resource management. Notable examples include the establishment of marine protected areas, community-based management approaches, and partnerships with NGOs and research institutions. Efforts should be made to enhance and coordinate existing opportunities among agencies and stakeholders to adopt a more comprehensive and effective strategy.

Malaysia's multicultural society and traditional knowledge systems offer a rich foundation for collaboration, integrating the wisdom of various communities into marine resource management practices. Cultural diversity is vital for better improvement.

Malaysia is a signatory to several international agreements and conventions linked to the preservation of marine life and the promotion of sustainable development. These accords and conventions provide a framework that is supportive of collaborative governance.

STAKEHOLDER ENGAGEMENT: KEY TO SUCCESSFUL COLLABORATIVE GOVERNANCE

Collaborative governance involves multiple stakeholders working together to achieve common goals. It is effective in achieving sustainable development outcomes. In the context of marine resource management, collaborative governance can involve clustering spatial management measures such as marine protected areas based on the principles of ecological connectivity and developing or enhancing collaborative governance networks of relevant stakeholders such as managers, community groups, and non-governmental organisations based on the principles of social connectivity (OECD, 2021; General, 2022). One key aspect of stakeholder engagement is promoting inclusivity and representation.

In Malaysia, the government has made significant efforts to engage with stakeholders in these areas. The 12th Malaysia Plan (12MP) is one such initiative that aims to advance sustainability by guaranteeing continuous economic growth while protecting the environment and continuing Malaysia's commitments to global targets. This theme builds on two game changers namely circular economy and integrated water resources management, critical in fulfilling the goal of building a better, greener, and fairer Malaysia in the post-COVID era. In building momentum towards the start of implementation in 2022, Economic Planning Unit Malaysia (EPU) in partnership with UNDP, organised an interactive dialogue and exchange session on 12 December 2021 with prominent academician, policymakers, members of civil society and private sector (Shafie & Tan, 2021).

Apart from that, the Malaysian government has made significant efforts to engage with stakeholders in the management of its maritime resources. Academic institutions and researchers provide essential data, research findings, and technical expertise to inform decision-making and adaptive management strategies. The Maritime Institute of Malaysia (MIMA) is a policy research institute set up by the Malaysian Government under the Ministry of Transport to look into matters relating to Malaysia's interest at sea and to serve as a national focal point for research in the maritime sector. MIMA focuses on several areas of research, including ocean law and policy, maritime security and diplomacy, coastal and marine environment, Straits of Malacca, and maritime economics and industries (Noh & Yashaiya, 2018).

In addition to setting up MIMA, the Malaysian Institute of Defence and Security (MiDAS) was also set up under the Ministry of Defence to look into matters relating to Malaysia's defence and security including those within the maritime domain. MiDAS as a think tank for the Ministry of Defence has a centre that focuses more on the ongoing traditional and non-traditional threats within the maritime domain such as national sovereignty, territorial disputes, trans-border crime, maritime legal instruments and framework, marine environment, as well as defence and security maritime engagement.

On another front, local universities such as Universiti Malaysia Terengganu (UMT) also play their role through the establishment of a research centre on the maritime environment and coastal erosion prevention (UMT, 2023). UMT has contributed their findings to the appropriate government agency in the area of sustainable development and marine resources management for Malaysia. Collaborative governance enhances the protection and resilience of Malaysia's marine ecosystems, safeguarding them against threats like climate change and habitat destruction. Sustainable resource management can boost economic opportunities for local communities, such as ecotourism and responsible fisheries, contributing to the country's economic growth.

By involving diverse stakeholders from various sectors and backgrounds, collaborative governance can benefit from different perspectives, knowledge, and expertise. This inclusive approach helps build trust among stakeholders while ensuring that decisions reflect the interests and needs of all involved parties. Furthermore, effective stakeholder engagement encourages transparency and accountability in decision-making processes. Regular communication channels facilitate information sharing, allowing stakeholders to stay informed about policies, regulations, and initiatives related to marine resource management (EAS Congress, 2006).

CASE STUDIES: SUCCESSFUL EXAMPLES OF COLLABORATIVE GOVERNANCE FOR SUSTAINABLE DEVELOPMENT AND MARINE RESOURCES MANAGEMENT IN MALAYSIA

One successful example of collaborative governance for sustainable development and marine resources management in Malaysia is the establishment of the Coral Triangle Initiative (CTI). The CTI is a regional partnership between six countries, including Malaysia, aimed at conserving marine biodiversity and promoting sustainable development in the Coral Triangle region (CTI, 2009). In Malaysia, the CTI has brought together various stakeholders, including government agencies, local communities, NGOs, and academia. One similar example of this is the UMT collaboration with Aquaria KLCC to organize the Coral Conservation Expedition at UMT Marine Natural Research Station on Bidong Island involving local students, fishermen and NGOs. This expedition focuses on replanting corals and bringing awareness to the public on the importance of coral to marine biodiversity (UMT, 2023).

In addition, through collaborative efforts, they have implemented several initiatives to address challenges such as overfishing and habitat degradation. For instance, they have established marine protected areas (MPAs) to conserve critical habitats and regulate fishing activities. An example of conserving and rehabilitating critical habitat is the national mangrove restoration projects led by the Ministry of Natural Resources and Environment Malaysia (NRE) which has involved multi-stakeholders comprising federal and state governments, technical agencies, research and institutions of higher learning, non-governmental organisations (NGOs) as well as civil and local communities. It is carried out through the “Tree Planting Program with Mangroves and Other Suitable Species Along National Coastlines”, which has been implemented since 2005 and involves a strategic integrated approach (Ramli & Zhang, 2017). The importance of mangroves to Malaysia was also translated in the formation of the Mangrove Research Unit (MARU) established in 1997 under UMT which has been conducting a wide range of research works in the mangrove habitats throughout Peninsular Malaysia (occasionally in Sabah and Sarawak).

With regards to overfishing an example of Malaysia tackling this issue is through Community-based co-management (CBCM). It is an approach that focuses on partnerships between government agencies, local resource users, NGOs, and other stakeholders. This approach is people-centred, community-oriented, and resource-based, where all parties share the responsibility and decision-making authority for managing a fishery (Viswanathan et al., 2003; Pomeroy et al., 2007).

Fisheries co-management is based on the principle that cooperation between communities and the state can lead to more effective governance of fisheries resources. This approach involves fishers and resource managers working together to improve the regulatory process for managing the resource, to ensure that the people who depend on the resource have a say in its management. An example of this is the collaboration between the Department of Fisheries Malaysia and local fishing communities in implementing co-management approaches (Nurul Islam & K. Viswanathan, 2021). These approaches empower local communities to actively participate in decision-making processes related to fisheries management.

The Semporna Islands, situated in the state of Sabah, serve as a noteworthy illustration of effective collaborative governance in the realm of marine resource management. Community-managed marine protected areas (MPAs) have been established via collaborative efforts between local communities, government agencies, and NGOs to safeguard coral reefs and fisheries. The Semporna Islands serve as a notable illustration of how collaborative governance can effectively facilitate the empowerment of local populations in assuming responsibility for their marine resources.

Apart from that, the success of the Pulau Pangkor Marine Conservation Programme shows the promise of shared leadership on the western coast of Peninsular Malaysia. To preserve the island’s marine ecosystems and encourage ecotourism, the government, locals, and scientists have joined forces for this endeavour. The local population now has better access to economic opportunities, and the health of the reef has improved thanks to more cooperative governance.

Last but not least, the coastline of Penang and its once-thriving fishing sector have been confronted with substantial challenges as a result of overfishing and the destruction of habitat. Penang’s collaborative governance efforts have centred on the formation of partnerships between local fishermen, government institutions, and non-governmental organisations (NGOs), with the goals of developing environmentally responsible fishing practices and protecting essential ecosystems such as seagrass beds.

POLICY RECOMMENDATIONS FOR ENHANCING COLLABORATIVE GOVERNANCE IN MALAYSIA'S SUSTAINABLE DEVELOPMENT AND MARINE RESOURCES MANAGEMENT

Strengthening Institutional Framework: The Malaysian government should establish a dedicated agency or department responsible for overseeing collaborative governance initiatives related to sustainable development and marine resources management. This entity should have the authority to coordinate and monitor the implementation of collaborative projects, ensuring effective stakeholder engagement.

Promoting Stakeholder Participation: Encourage active involvement of all relevant stakeholders, including local communities, NGOs, academia, and industry representatives, in decision-making processes ensuring that all stakeholders have a voice and a say in shaping policies and management plans. To foster inclusivity and collaboration, it is imperative to involve a wide array of stakeholders. Implement mechanisms such as public consultations, participatory workshops, and multi-stakeholder platforms to ensure diverse perspectives are considered.

Enhancing Transparency and Accountability: Establish clear guidelines for information sharing among government agencies, stakeholders, and the public regarding sustainable development initiatives in Malaysia's marine sector. Facilitating open channels of communication and promoting the exchange of information are essential strategies for fostering trust among stakeholders.

Compliance and Enforcement: Engaging local communities and other stakeholders in the management process can enhance compliance with regulations and increase the effectiveness of enforcement efforts.

Private Sector: Commercial fishing companies, tourism operators, and businesses involved in the seafood industry have a role to play in sustainable resource management. Collaborative governance can help align their interests with conservation efforts.

Local Communities: The inclusion of local communities, particularly indigenous and coastal populations, is crucial for the success of collaborative governance. Their traditional knowledge and on-the-ground experience are invaluable for sustainable resource management.

CONCLUSION: THE WAY FORWARD FOR COLLABORATIVE GOVERNANCE IN MALAYSIA'S SUSTAINABLE DEVELOPMENT AND MARINE RESOURCES MANAGEMENT

In conclusion, collaborative governance offers a promising path forward for Malaysia in achieving sustainable development and efficient marine resource management. The challenges are significant, but the opportunities are even greater. Through the establishment of a collaborative framework that encompasses a wide range of stakeholders, such as governmental bodies, NGOs, local communities, and the corporate sector, Malaysia has the potential to develop a holistic strategy that effectively harmonizes economic advancement, environmental preservation, and social fairness.

Collaborative governance holds immense potential for Malaysia's sustainable development and marine resources management. The case studies and discussions presented in this

text highlight the benefits of involving diverse stakeholders, including government agencies, local communities, NGOs, and the private sector. By embracing collaborative approaches, Malaysia can achieve more effective decision-making processes that consider various perspectives and interests. Moving forward, Malaysia must prioritize the establishment of robust institutional frameworks that promote collaboration among stakeholders (VietNamNet News, 2023).

The success stories in some cases such as Semporna Islands, Pulau Pangkor, and Penang demonstrate that collaborative governance is not only feasible but also beneficial for marine resource management in Malaysia. The involvement of local communities and their traditional knowledge, combined with the support of NGOs, researchers, and government agencies, can create a resilient and sustainable future for the country's marine resources.

As Malaysia continues to face the challenges of overfishing, habitat degradation, and climate change, collaborative governance offers a ray of hope for the preservation of its invaluable marine ecosystems and the prosperity of its coastal communities. It is a model that encourages all stakeholders to come together, share their knowledge and resources, and collectively work towards the common goal of safeguarding the nation's marine resources for future generations.

This includes enhancing coordination mechanisms between different government agencies responsible for sustainable development and marine resources management. Additionally, strengthening capacity-building initiatives for all stakeholders involved will foster a greater understanding of collaborative governance principles and practices. Furthermore, continuous engagement with local communities is essential to ensure their active participation in decision-making processes. Empowering communities through education and awareness programs will enable them to contribute their traditional knowledge and practices towards sustainable marine resource management (Regional Marine Strategy, 2023).

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ARMY4NEXTG: THE CONCEPT OF THINKING SOLDIERS IN SUPPORT OF MALAYSIAN DEFENCE POLICY

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ABSTRACT

In a defense landscape driven by increasing multi domains operations and advanced technology, how do military organizations empower concepts and military personnel? This article provides an overview of the concept of Army4NextG in the Malaysian Army (MA) to develop Thinking soldiers as characteristic of modern warriors to support Malaysian defense policy. Thinking Soldier is a part of MA's human resource development plan strategy to equip military personnel with Knowledge, Skills, and Abilities (KSAs) to perform in military operations. Military personnel at each level in the MA must be cognitively ready for military deployment and can adapt and apply their knowledge and experience in a variety of contexts that can be utilized when required. Under Army4NextG development plan has undergone significant to develop thinking soldiers that have transformed the MA in many meaningful ways to achieve force objectives to meet security challenges in the 21st century. Its conclusion will help MA and policy practitioners establish the culture and behavior through military training that promotes thinking soldiers which to derive KSAs needed to execute a task at the desired level of performance in modern warfare.

Keywords: *Defence strategy, Thinking Soldier, Human Dimension, Military Training, Military Readiness*

INTRODUCTIONS

“The role of the Malaysian Armed Forces is a very challenging one. Apart from national defense, it is also involved in the process of nation-building – Tun Mahathir Mohamad”

This quote provides significance for the Malaysian Armed Forces' (MAF) role to defend the state against real or potential external threats and protect national interests. What is needed, therefore, is an approach to the acquisition and management of the defense capability for the effective and efficient preparation of a new generation of armed forces that need a different set of knowledge, skills, and abilities (KSA). The direction of MAF strategies is to design its capabilities as a credible force toward defense self-reliance [1]. In conjunction with MAF visions, the Malaysian Army (MA) launched its transformation plan under Army4NextG in 2021. What kind of soldiers does MA require? The Army4NextG transformation plan strategy is to maintain the highest standard of professionalism of soldiers and the organization must be efficient [2]. Realizing the importance of human resource development, Army4NextG focuses on the development of Force Objectives to facilitate the implementation of Thinking Soldier. As the MA considers human resource development policies as part of the pillar Army4NextG to enhance soldier readiness with military knowledge, skills, and abilities (KSAs) to perform in military operations. Understanding

Malaysian Defence Policy and Malaysian Defence White Paper is, therefore, necessary for one to fully appreciate the transformation MA plan that has to undergo since its adoption of Army4NextG, ultimately in preparing Thinking Soldier at each level (strategic, operational, and tactical) to achieve cognitive readiness.

This article serves as a background to understand the making of Army4NextG related to the aspect of how MA strategy to fostering on the human dimension and quality of the soldier by creating the human resources necessary to carry out this kind of extensive and persistent form of war to facilitate the concept of Thinking Soldier. Complex Operating environments (COE) in military operations will require soldiers to process large amounts of mission-critical information within short periods and interact with technology systems [3]. Solving these challenges depends on the cognitive abilities of a soldier such as thinking skills, problem-solving and decision-making processes in these environments will promote mission success and operational effectiveness. The cognitive readiness literature has always recognized the significance of military training on how and why a soldier should be trained for thinking enhancement [4]. The development of Thinking Soldiers is starting with basic combat training on “soldierization” (transforming a civilian into a soldier) when someone joins the military to become a soldier [2]. Military training is fundamental in developing soldiers’ readiness but the way to design, deliver, and implement a training program has to refer to the science of training [5]. The MA management practice needs to consider decisions about what to train, how to train, and how to implement and evaluate training should be informed by the best information science has to offer in preparing Thinking Soldier to ensure the security and stability of the nation as well as protect Malaysian interests.

THE MAKING ARMY4NEXTG CONCEPT

The consideration behind Malaysia’s defense policy is self-reliance which focuses on maintaining and ensuring its overall national interest and security are protected [1]. Being a relatively small nation, located strategically with rich resources and the physical attributes of common land and sea area boundaries with most of the ASEAN states. Malaysian attracts increasing international attention that demands its security development especially Malaysian Armed Forces (MAF) capabilities including Army, Navy, and Air Forces. It calls for the application of the denial strategy and the development of a credible armed force with an effective war-fighting capability to deter any act of hostility or aggression by adversaries. On the other hand, the concept of Army4NextG is responsible for all matters related to the defense of Malaysia in line with Malaysia’s defense policies and MAF functions [2]. To carry out the MAF function, MA concentrates to modernize with the required manpower, organization, and equipment for modern warfare involving multi-domain operations (land, sea, air, and cyber).

Despite its desire to achieve Force Objectives for multi-domain operations, the MA aims to enhance military personnel and performance through the development of Thinking Soldiers as a part of human resource management from the idea of Army4nextG [2]. Thinking capability is the critical variable supporting all soldier performance: physical, mental, cognitive, and emotional [6]. The MA, since its inception in 1933, has been a vital pillar to defend the sovereignty of the nation from internal and external threats. The MA human resources development strategy is part of the requirement to meet the role and responsibility of the armed forces as an element that represents the Malaysian Armed Forces (MAF) to defend Malaysian sovereignty. However,

emerging technologies will change all battlefield roles and operational effectiveness relies on military training to train soldiers who are ready to operate across missions in environments of military operations.

In modern military operations, a combination of physical, mental, and cognitive abilities is paramount for soldiers [7][8][9]. Military actions mostly depend on the military knowledge, skills, and abilities of the soldier to execute military operations [10]. Because of this, the MA strategy is to enhance soldiers' readiness to develop the Thinking soldier concept. The Thinking Soldier is based on military personal critical thinking skills, problem-solving, and higher thinking skills. This concept is also seen to have the capacity to integrate humans and technology to empower human resources that enable soldiers to operate in a complex operating environment (COE). So why is the Thinking Soldier concept so important? Let's start with the evolution of the MA transformation plan under Army4NextG in line with modern warfare needs and requirements of armed forces.

THE EVOLUTION OF THE MALAYSIAN ARMY TRANSFORMATION PLAN UNDER ARMY4NEXTG

The MA origin can be traced back to the early 1930s. From its early establishment, MA has operated under Malaysia's internal security on the militant threat posed by the Communist Party Malaya (CPM) and the North Kalimantan Communist Party (NKCP). The government introduced modernization (PERISTA) between 1979 to 1983 integrate capabilities required by combatant commanders to execute their assigned missions [1]. Externally, Malaysia was equally concerned over the power ideological rivalry that these concerns posed security problems for the countries in the region. Today, Malaysian main concern is to strive towards maintaining and ensuring a conducive environment to meet the challenges of security threats in the 21st century. Because of these factors, MA needs to take serious cognizance of the transformation plan to enhance MA capabilities [2]. Significantly, the end of militant threats by CPM and NKCP has also brought about global and regional changes resulting in new trends in international security scenarios that will affect countries in the region.

The defeat of the CPM and NKCP and the subsequent restoration of peace and security in the country has enabled the MA to reorganize itself towards a more conventional force. Key reasons why the government introduced the Malaysian Defence White Paper (MDWP) saw that all services need to focus on the forces' capabilities development including human resource management to meet emerging security challenges [11]. The soldier is a crucial element for the transformation plan of Army4NextG to develop its capabilities for rapid and decisive maneuvers. The modernization program involves new weapon system and equipment that demands soldiers are competent with military KSAs for modern warfare. Dealing with new challenges, military organizations acquire new ideas for the development of armed forces to be able to improve military readiness. Consequently, the solutions of action to what often are framed as problems in military organizations to adapting the functionality of modern armed forces [2].

In addressing modern warfare, MA seeks to develop a balanced capability in all dimensions of warfare in firepower, mobility, intelligence, communications, cyber and logistic support to contribute toward self-reliant armed forces capable of upholding the sovereignty of the nation as well as defending and protecting Malaysia's strategic interests. It is also mindful of the

rapid Revolution Military Affairs (RMA) would impact upon the aspect of integration and joint operation with the Malaysian Navy and the Royal Malaysian Air Forces to meet the demands of understanding multi-domain operations (MDO) [11]. In line with the challenging multi-domain operation environment, the MA has embarked on a modernization program including enhancing the human resource development of Thinking Soldiers. With this development, the MA requires soldiers who are mental preparation with KSA to perform in military operations.

THINKING SOLDIERS

Soldiers are not born but made. Soldiers have always been an important role in success on the battlefield. The MDO with greater complexity, fog, and friction as the battlefield expands into space and cyberspace. In the military environment, combinations of extreme physical and mental fatigue, high levels of anxiety and stress, and environments of great unpredictability require the soldier to face and adapt. Soldiers need to maintain effective cognitive performance in COE military operations that demand the sustained focus of attention or concentration, as well as the rapid processing of information. To meet these challenges, MA must remain aligned with the Malaysian Armed Forces policy to develop human resources to ensure soldier readiness [11].

The environment and military strategy have changed considerably in the last few decades because of Revolution in Military Affairs (RMA). Modern warfare must look at a different dimension of warfare and deal with the uncertain environment that requires competent soldiers and technology. To operate effectively under conditions of uncertainty and complexity, soldiers must think critically to reduce uncertainty through the understanding situation in the military operation [11]. Finally, the thinking soldier concept has been introduced, and development of strategies with specific military training programs designed to equip the knowledge, skills, and abilities of military personnel to fight for multi-domain operations [2].

Developing the future force is important to implement concentric deterrence, the MDWP's first pillar of defense strategy. The MAF serves as the "Nation's Shield" entrusted by the Government to uphold the National Defence Objectives at all times. The force structure and force posture need to be reshaped to better address armed intervention, and natural disasters and realize the need to conduct two-theatre operations simultaneously between Peninsular Malaysia, Sabah, and Sarawak. The Government shall develop the MAF into an integrated, agile, and focused force, capable of responding to traditional and non-traditional threats during peace or conflict, with a high level of readiness to perform its operations amid the unpredictable security environment [11]. With this purpose, the MA provides a specified core element that forms force development emphasis on the improvement of military personnel readiness as illustrated in Figure 1.1.



Figure 1.1: Army4NextG - Thinking Soldier Concept [2]

Thinking is a basic human activity when individuals are confronted with real problems. Soldiers still struggle with predicting what is going to happen in military operations and what KSA are needed to solve complex situations. Fundamentally, Thinking Soldiers emphasizes the development of a soldier's professional, innovative, creative, agile, fighting spirit, spiritual power, military mind, and intellectual are essential characteristics of the soldier to encounter modern warfare. This concept drives soldiers to improve cognitive abilities especially critical thinking skills, problem-solving skills, and higher thinking skills due to its potential to contribute to individual performance in the military operation. More specifically, thinking soldiers is a future development plan of MA strategy for reaching the Objective Forces. The Objective Force focuses on capability-based that integrates soldiers with technology to address security challenges. The MA will also work towards upgrading and improving capability with new weapon systems and equipment in achieving a force that is lean compact and effective. Hence, the MA needs to be structured, equipped with modern equipment, and highly dedicated soldiers with adequate knowledge, skills, and abilities. Recognizing the need for the important concept of Thinking Soldier, MA introduces the Malaysian Army Training System (MATS) on how to transform MA training to produce soldiers that enable them to perform for military deployment at the desired level of performance [2].

MALAYSIAN ARMY TRAINING SYSTEM

The Army 4NextG is the MA development plan that provides a framework for improving human resource development as part of an Objective Force by aligning the organization's goals, system-level requirements, organizational programs, and military training [2]. Military training and educations are human resources development strategies to increase soldiers' readiness. In the context of increased complexity, unpredictability, and ambiguity of military operations, what

is needed for preparing soldiers on the real battlefield? Military training is defined as a process intended to establish and improve the capabilities of soldiers (prepared (trained), able (skills), and motivated) to perform in the complex environment of the military operation. The impact of military training should be explored from several perspectives for individual readiness who (soldier) is expected to apply what (e.g., selection of tactical and strategic plans), when (in the dynamic, complex, and unpredictable environment of military operations), and in which conditions (stressful or unfamiliar). Training literature has often described the science of training [12][13][14] and it is influenced by the transfer training process [15][16][17] impact on thinking enhancement [18][19][20][21].

In United States America (USA), research and development targeting soldier thinking performance enhancement is a priority area to increase the ability to achieve and sustain military dominance through accelerated military training [22][23][24]. Thinking performance enhancement is important to help soldiers and teams maintain peak performance in the face of the environment involves the application of technologies and techniques. The US Army focuses on targeted training technologies and methods, transcranial electrical brain stimulation, and reality augmentation approaches to enhance soldiers' thinking enhancement [25][26][27]. In contrast, The People's Liberation Army (PLA) of China believes that emerging technologies, especially artificial intelligence (AI), become as critical to victory on the future battlefield as information technology [28]. The PLA explores and experiments with new concepts and capabilities to enhance its combat power by studying and adapting lessons learned from American concepts and initiatives [6][27]. The process of transforming concepts in the capabilities of human cognition is recognise the importance of balancing human and machine elements in decision-making for future warfare. Hence, continuing research on military training by military organizations improves the human component of warfighting.

The objective of military training specifically prepares individuals and teams with the knowledge, skills, and abilities based on current situation involvement in military operations by focusing on individual and collective military training at all levels of strategic, operational, and tactical levels of military organizations. MA development plan also focuses on capability detection, survival, strike, sustainment, protraction, and nation-building. To achieve this vision, the MA needs to redesign military training and education based on the Malaysian Army Training System (MATs)[2]. The focus is to enhance elements of the cognitive, psychological, and spiritual of soldiers in terms of the tasks they needed to perform. The process of deciding why, what, and who should be trained in the initial stage of training development. Figure 1.3 shows the Malaysian Army Training System to develop the Thinking Soldier concept.

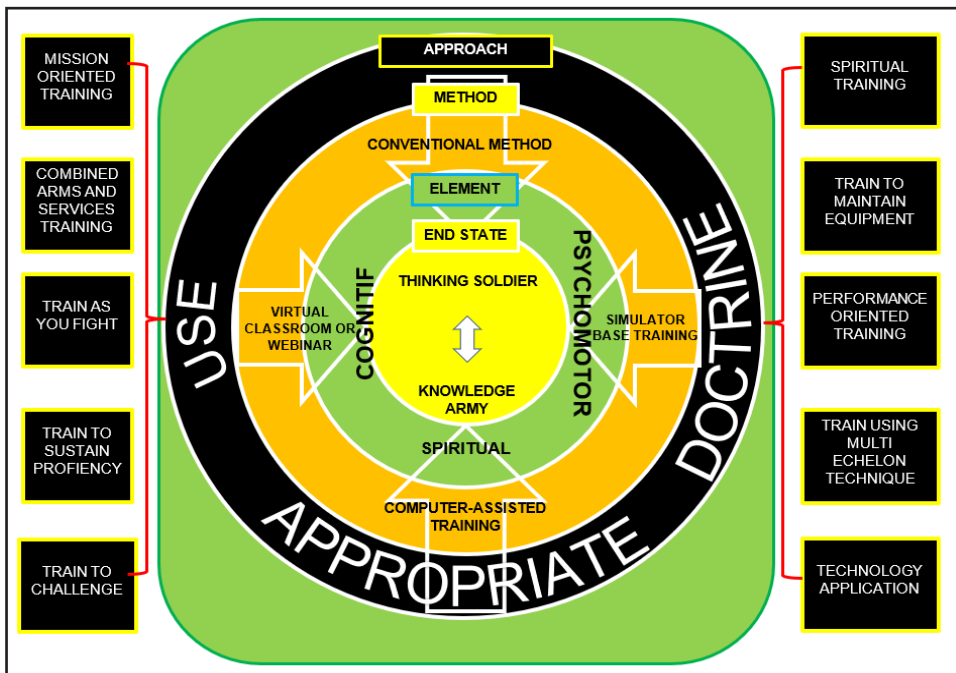


Figure 1.3: Malaysian Army Training System [2]

Thinking soldiers strategically related to the capability of the human dimension in enhancing the military readiness process dealing with the environmental security challenges. The security environment is marked by volatility, uncertainty, complexity, and ambiguity (VUCA) where the capability to defend and promote national interests might be restricted by material and personnel resource constraints. That's the reason why the human dimension is a very complex area that influences future military readiness. With that purpose, the MA established Army4NextG with a set of strategies for the way soldiers fight, how to prepare soldiers to fight tactically and operationally, how organizations organize to fight and everything necessary to equip our forces that require for the fight. For this to be possible, the MA leaders focus on soldiers' training using the necessary tools and methodologies based on MATs to be qualified for peacetime, wartime, and various contingency operations to meet the force's objectives at the strategic, operational, and tactical levels are focused on the thinking enhancements.

CONCLUSION

The future of military operations is expected to expand further involving the challenging of security threats and battlefield technologies' impact on the character of war and on how military operations will be conducted, including the fundamental role of the armed forces. The changes in the complex operating environment in military operations have led the military to rethink its role and search for new missions. Clearly defined military roles and missions are fundamental to enhancing the military capabilities of armed forces are for and how they should be structured and organized. The MA will continue with its efforts to the modernization program supported by the management practice and cost-effective ensuring the role in safeguarding the sovereignty and territorial integrity of the nation. Proper guidance and prioritization through research and development need to explore in line with the Army4NextG concept in developing thinking soldiers. The rationalization of the

MA to develop thinking soldiers to meet a new force structure and war doctrine dealing with emerging security challenges. The MA must ensure that a MAF has the necessary forces, assets, facilities, and capabilities to fulfill its tasks throughout the full spectrum of its missions more effectively in new and challenging modern warfare environments.

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TECHNOLOGICAL SURGE: CHALLENGES FACED BY MINDEF IN IMPLEMENTING GREEN TECHNOLOGY POLICY IN MALAYSIA'S MILITARY DEVELOPMENT

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ABSTRACT

Malaysia's defense policy objective is to achieve a balance and integration of a combination of assets and other resources with the purpose of strengthening national defense. Historically, Malaysia had hardly any active development program in the military before gaining independence in 1957 as the nation's defense industry at the time only had minimal capabilities for repair and overhaul. However, Malaysia's political, economic, and social development policies underwent significant changes after the 1960s and the early 1970s when Malaysia adopted to an import strategy in an effort to create stability in trading. This paper analyses Green Energy Technology and focuses on the Ministry of Defence Malaysia (MiNDEF) in implementing green military equipment. The primary objective of this paper is to analyze the extent to which the issues faced by MiNDEF related to energy consumption affect Malaysia's national security, reliance, maintenance, and annual budget allocation. This study utilizes qualitative research approach to evaluate the current defense approach related to military weapons in Malaysia. This study found that MiNDEF has to face several challenges in implementing GE Technology, leading to foreign reliance, current logistic issues in maintenance, and budget constraints. By implementing GE technology in Malaysia's military industry, national security can be enhanced as an alternative strategy. However, in order to achieve new alternatives in defense mechanisms, the Ministry of Defence needs to address these challenges, optimize energy usage, and plan new strategies for future security.

Keywords: *Green Energy Technology, Military industry, Malaysia Ministry of Defence*

INTRODUCTION

Energy has always been a critical factor in every battlefield or mission. Military operations encompass land, water transport, air, and installations based on the operational location. With the rapid globalization and technological advancements, the discussion of new clean energy sources and the challenges faced by the military has become a hot topic (Sovacool et al., 2017). Green Energy Technology (GET) is inherently designed to be environmentally friendly and sustainable, contributing to global efforts to reduce emissions that contribute to climate change and diminish the reliance on non-renewable resources. Moreover, green energy has the potential to enhance military performance while aligning with Malaysia's Green Energy Plan, which aims to embrace clean energy technologies such as wind, solar, water, nuclear power, natural gas, and bioenergy.

According to the European Defence Strategy (2022), green energy plays a pivotal role in shaping the future strategy of the EU Security and Defence Policy operations, particularly in

addressing warfare and crisis management. With green technology emerging as a new opportunity and industry, it goes beyond combating the climate emergency; it becomes a competition among global leaders, influencing the hierarchy of nations and future global power dynamics (European Defense Energy, 2022).

Meanwhile, under the administration of President Joe Biden, the US Army has unveiled its strategy to prepare for conflicts driven by global warming. By 2030, half of all non-combat vehicles will be electrified, and by 2050, combat vehicles will follow suit (Birnbbaum & Root, 2022). Another significant green initiative involves the development of alternative energy sources such as solar and wind power, which will enhance the military's resilience by reducing reliance on fuel convoys (Singh & Gupta, 2022). The concern arose when US armed forces faced ambushes during fuel missions, affecting the lives of soldiers and critical resources.

The Asia-Pacific region has also witnessed active development in green technologies, with a focus on sustainable development, often referred to as clean technology. For example, China has been implementing green policies and the Law for the Promotion of Clean Production, aimed at utilizing clean energy and raw materials to enhance efficiency in electricity utilization and environmental protection (Mol & Liu, 2005). The Chinese People's Liberation Army (PLA) has recently established a micro-power grid system for over 80 border defense outposts in remote areas and islands. This system provides troops with stable and reliable energy, serving as a backup power source to diesel oil and battery storage (Leung, 2021).

In the Southeast Asian region, the Association of Southeast Asian Nations (ASEAN) has recognized the UN 2030 Agenda for Sustainable Development as a complementary to its regional community-building's efforts to enhance the quality of life for their people. A major focus of the current ASEAN Socio-Cultural Community Blueprint 2025 is on the promotion and assurance of layered protection, along with the continuous development and adoption of environmentally sound technologies (Tay et al., 2017). Countries such as Vietnam have been actively developing their solar power applications since the 1990s. Manicub, a hybrid technology utilizing renewable energy sources, has been used in Vietnamese solar-powered homes, ships, and ambulances (Dong et al., 2019). Meanwhile, in Indonesia, the government is actively working to increase the use of the New and Renewable Energy Law (NRE), such as Peraturan Presiden No. 4 2016 (Pasal 14), as part of its efforts to advance the electricity infrastructure to meet the fuel requirements of the Indonesian Army (Kontjoro et al., 2021).

On the contrary, Malaysia has successfully implemented national development plans, placing a significant reliance on green technology for economic development. This approach has contributed to a reduction in economic and social problems, such as poverty, unemployment, and population challenges (Zaboon & Salih, 2021). As a developing country, Malaysia has launched the National Biomass Strategy to enhance its competitiveness in clean energy alongside other nations. This strategy focuses on locally-based innovation for producing bio-based chemicals and bio-energy (Rashidi et al., 2022). Under Malaysia's Ministry of Defence, the government plays a critical role in strengthening national defense capabilities, aiming to establish Malaysia as a military asset producer (Abdullah & Haliza Mohd Zahari, 2023). To achieve this target, the government has made significant efforts through cooperation and technology transfer with other military producers, including the USA, Italy, China, and Turkey (Yaakob, 2021). Regarding green energy, Malaysia has developed plans to enhance green energy consumption, in which, the country has set new targets under Malaysia's Renewable Energy Roadmap (MyRER), aiming to provide

31% of the nation's energy by 2025 and 40% by 2035 (Reuters, 2023). Currently, Malaysia is focusing on aspects of energy transition and the reduction of greenhouse gas emissions at the 26th Conference of the United Nations Framework Convention on Climate Change (UNFCCC COP 28) in Dubai (RTM, 2023).

This paper, therefore, aims to examine the extent to which issues related to energy consumption impact Malaysia's national security, reliance, maintenance, and annual budget allocation for the Ministry of Defence (MiNDEF). To accomplish this, the paper will emphasize existing military equipment and the challenges faced by defense departments, focusing on their equipment and strategies. Additionally, this paper identifies the challenges associated with implementing Green Energy technologies as a new security policy mechanism.

This paper begins by providing an overview of the existing literature related to the topic under examination, encompassing Malaysia's military development, green technology, and green energy. Following this, the paper elucidates the research methodology employed in this study. Subsequently, it presents the findings and analysis derived from our research. Finally, the paper concludes with research findings and policy recommendations.

LITERATURE REVIEW

Malaysia's Military Development

Historically, Malaysia had little active military development prior to gaining independence in 1957, lagging behind its neighboring countries. At that time, the nation's defense industry had minimal capabilities for overhauling. However, Malaysia's political, economic, and social development policies underwent significant changes in the 1960s and early 1970s, as political forces led the country to adopt an import strategy aimed at creating stability in trade. As Malaysia progressed through different development stages, the government-led initiatives focused on the defense industry in three key sectors: aerospace, maritime, and ordnance. By the 1980s, Malaysia decided to make more aggressive investments in heavy industrialization, aligning with the launch of the Malaysia's Master Plan in the Look East Policy and heavy industry. The Master Plan primarily emphasized heavy industry, particularly the basic metals industry, which had a profound impact on the defense industry. During this period, the primary goal was to provide the Malaysian Armed Forces (MAF) with through-life maintenance, repair, and overhaul support in the form of logistical assistance. Industrial development was centred around meeting the needs of various service branches. For instance, the Royal Malaysian Air Force (RMAF) aircraft were serviced by the Air Force Aircraft Maintenance and Overhaul Depot (AIROD), while the Malaysia Explosives Company (SME) was responsible for producing small guns, ammunition, grenades, and fireworks, serving the needs of TUDM (Megat, 2021).

In the late 1980s and mid-1990s, Malaysia initiated a new set of modernization programs for the future of its defense industry. During this period, countries like Brazil, Turkey, and India had already made significant strides in manufacturing, establishing their own positions in the defense industry (Balakrishnan, 2008). Indonesia and South Korea were making substantial investments in arms production, while Singapore was expanding its capabilities in Maintenance, Repair, and Overhaul (MRO) and became a regional aerospace center (Bitzinger, 2013). Malaysia has recognized that it had fallen behind in terms of military development. Politically, Malaysian leaders aspired for the country to become strong and economically progressive. While economic

development remained a priority in Malaysia's national interests, the importance of the defense industry was also acknowledged as crucial for regaining momentum through the acquisition of advanced technology.

In 1982, Malaysia formulated the National Defence Production Policy, providing precise guidelines for the development of the local defense sector. Given the scarcity of strategic manufacturing equipment and the burden of providing support services, it was determined that state-owned enterprises would take responsibility for military production (Megat, 2021). By 1990, Malaysia's defense industry comprised small businesses that supplied products and a limited number of large corporations. These large corporations, while offering essential services to the military, such as the construction of locally made ships and aircraft maintenance and servicing, did so as part of their primary civilian operations.

In the era of Industry 4.0 adoption, the Malaysian army is currently undergoing a process of modernization and conventionalization. This encompasses upgrades in both weaponry and equipment, as well as a restructuring of training methods to enhance conventional warfare capabilities. However, the Malaysian army is also grappling with new challenges, such as the threat of cyber-attacks. As noted by Balakrishnan (2008), the fundamental elements of Malaysia's army continue to revolve around defense mechanisms, including combat power, firepower, and proficiency in warfare skills, all aimed at preparing for various security situations. Presently, Malaysia is actively working on its first-ever Defense White Paper (DWP). The primary objective of this historic document is to provide the general public with insights into the Ministry's objectives and long-term plans for enhancing Malaysia's defense and security. Achieving these goals requires a comprehensive effort involving participation from the entire society. In the wake of the 9/11 incidents, the world witnessed a shift in global security dynamics. Given Malaysia's geographic location in the heart of Southeast Asia, sharing borders with seven other countries, it is essential for the nation to remain vigilant and proactive in addressing security concerns.

Thus, Malaysia's Defense policy objective is to achieve a balance and integration of various assets and resources, all aimed at strengthening national defense. All improvements and developments encompass four key spectrums: land, air, sea, and the electromagnetic spectrum, which is crucial in modern warfare. While Malaysia's Armed Forces (MAF) continue to produce well-trained personnel, a significant focus is also directed towards the improvement of military equipment through Research and Development (R&D). This is essential to ensure that MAF is equipped with the best defense systems during operations.

Understanding Renewable Energy Source

While alternative energy may seem like an additional and conventional form of energy, developed countries have embraced this new energy source with the support of government initiatives and technological advancements. In the context of definitions, Maradin (2021) highlights Renewable Energy (RE) as an alternative to fossil resources. However, defining alternative energy precisely poses challenges due to the various existing energy sources and different objectives in promoting each type of operation. Another perspective on renewable energy argues that renewable energy is naturally replenished at a rate faster than energy consumption, or it involves durable resources due to their natural availability (Van Vliet et al., 2012). Renewable energy sources can be continuously renewed and are considered inexhaustible, even though the consumption process can deplete them. According to Ellaban et al. (2014), renewable energy sources are continuously

replenished by nature and derive either directly or indirectly from the sun, distinguishing them from fossil fuels, waste products from fossil fuels, or waste from inorganic sources. Examples of renewable energy sources include wind, hydropower, and photosynthetic sources.

Renewable energy has increasingly gained attraction in economic sustainable development. It not only surpasses energy demand, but also, promises to be a significant contributor to future global energy sources. Larionov et al. (2021) argue that renewable energy demand offers several advantages. First, concerning energy security, green energy sources open up possibilities for fuel diversification. Since the military heavily relies on fuel during missions, the integration of new energy sources allows the Malaysia Armed Forces to maintain a stock of multiple fuel blends, enhancing their energy security. Secondly, renewable energy can serve as an effective solution for addressing energy access challenges. Overall, the protection of the environment are primary factors in promoting renewable energy to the world, especially the evidence of the sources contributing zero per cent of greenhouse gas emission and pollution (United Nation Development Program, 2000). Malaysia also has taken the initiative to align with the objectives of international environmental standards by taking all the practical measurements of the Millennium Development Goals (Choong, 2010). Malaysia's Defense industry development relies on the development of the economy in order to have full support in any kind of innovation or R&D and financial support. On the other perspective, Doleček & Karabegović (2013) emphasises utilisation of renewable energy can be manifested in the encouragement of economic development of a nation specifically in the energy sector and all related sectors in this industry.

Technological innovations in renewable energy have the potential to drive the production of energy machinery products and equipment, which, in turn, can attract increased investment. Maradin (2021) argues that the adoption of new technologies in renewable energy can lead to improvements in business processes and economic development, with a strong emphasis on the participation of a qualified workforce. This implementation can also result in the creation of new job opportunities, particularly in the field of military research and development related to new energy sources. However, as noted by Osorio-Tejada et al. (2017), the availability of job opportunities in this sector depends on the level of activity within the plant life cycle and the extent of renewable energy exploitation. Additionally, Maradin (2021) points out that renewable energy does come with challenges. Geographical location and weather conditions can introduce unpredictability and limitations in energy generation.

According to Sagar (2021), energy is an essentially boundless resource that should be harnessed as an energy asset and efficiently utilized. Research underscores the importance of considering externalities expenses, reliability, effectiveness, and ecological impact. Mohtasham (2015) also emphasizes sustainability analysis dependent on renewable energy, which comprises three main components: externalities cost, economic aspects, financing, and environmental impact. Even in developed countries, renewable energy, while significant, has not yet become the predominant source of energy. This aligns with the argument put forth by Peimani & Taghizadeh-Hesary (2019), who found that Singapore and the Philippines have differing approaches to achieving sustainable development. They take into consideration factors such as affordability, availability, acceptability, and plausibility, despite both countries being dominated by fossil energy sources. Maradin (2021) also underscores the costs associated with developing renewable energy power plants, particularly in marine energy, which can be exceptionally expensive due to their location. In support of this statement, Ellabban et al. (2014) argue that energy can be derived from six distinct sources: (i) waves, (ii) tidal range, (iii) tidal currents, (iv) ocean currents, (v) ocean

thermal energy conversion, and (vi) salinity gradients. Each of these sources originates differently and necessitates specific technologies for conversion.

Renewable Energy and military equipment

Referring to the American army during operations, it consumed approximately 880 million gallons of fuel and utilized about 9.1 million megawatt-hours of electricity. This highlights the significance of addressing price volatility and achieving energy independence. As Scholtes (2013) points out, the potential to replace traditional fuels with renewable energy sources can lead to a reduction in overall fuel consumption and demand. The idea of transitioning to alternative energy sources not only reduces the military's reliance on fossil fuels but also enhances its resilience by reducing dependency on the electric grid system. This shift allows the military to allocate resources to upgrade other critical areas.

With the world evolving technologically and in terms of procurement, global military leaders have become increasingly concerned with issues related to energy supply. These leaders have also actively engaged in research and development (R&D) endeavors, particularly focused on technologies that improve resource efficiency and minimize environmental impact.

For instance, the United States has recognized the significance of Army research & Development (R&D) through the Research, Development and Engineering Command (RDECOM). The RDECOM oversees R&D and technology budgets aimed at producing products and designs, tailored to address the complexity of current security threats (Lyons et al., 2005). France, on the other hand, ranks second to the United States among OECD countries in terms of representing more than one-third of R&D expenditure (Hebert, n.d). In 2021, under France's Military Planning Law, the military budget saw an increase to 39.2 billion euros, marking a 1.7 billion euro rise compared to the previous budget allocation. This budget allocation primarily focuses on fostering innovations, enhancing personnel, upgrading military defense systems, and modernizing the French armed forces (Ministry of the Armed Forces (France), 2023).

As noted by Hoffman (2014), different countries approach military-energy challenges with varying methods and emphases. These differences also reflect varying levels of development among countries that engage with renewable energy. Balakrishnan (2008) underscores the significant financial gap between developing and developed countries when it comes to acquiring cutting-edge technologies for utilizing new energy in military operations. Tommey (2015) further highlights the challenges associated with developing new energy sources for military purposes, including federal restrictions on new energy projects, cost considerations, technological challenges, and the entrenched use of traditional energy sources. However, as Tommey (2015) points out, renewable energy holds the potential to provide advantages in addressing future security threats. It can reduce the reliance on fossil fuel sources, thereby mitigating the risks of terrorist disruption during military operations at domestic installations.

Green Technology

Green technology, also known as clean technology, is designed to be environmentally friendly and aims to conserve natural resources with the goal of having zero impact on the environment. Bhardwaj & Neelam (2015) have provided a distinction between technology and green technology to clarify the knowledge gap between these two terms. The term 'technology'

primarily focuses on the production process, encompassing techniques, skills, and resource utilization to create desired products and services. On the other hand, 'green technology' pertains to the development of equipment and systems aimed at conserving natural resources, with a strong emphasis on minimizing adverse impacts on the environment and humanity.

Iravani et al. (2017) further explained the categories of green technologies, which include:

- (i) Monitoring and evaluating,
- (ii) Pollution prevention,
- (iii) Control, and
- (iv) Remediation and restoration.

Drawing from previous literature on challenges related to renewable energy, it is evident that obtaining consistent renewable energy can be significantly unpredictable depending on weather conditions. Venkadeshwaran (2019) has criticized the current status of global technology production for its unnecessary derivatives. However, Iravani et al. (2017) emphasized the importance of prevention technologies that mitigate the production of hazardous materials, which can lead to environmental damage. The development of green technologies, such as solar cells that directly generate electricity and light through the photovoltaic process, plays a crucial role in reducing the reliance on fossil fuels and contributes to a nation's sustainability goals.

According to Carrard et al.'s analysis from 2011, the discovery of raw groundwater is considered more affordable and practical in the long term. This is attributed to Malaysia's substantial annual rainfall, estimated at 990 billion m³, with 550 billion m³ categorized as runoff water that flows into rivers and lakes. However, it is noteworthy that the level of public awareness and knowledge regarding green technology remains insufficient (Mustapha et al., 2019). This holds particularly true in Malaysia, where community attitudes tend to be less concerned. Despite the lack of awareness among many Malaysians, a study by Siti Rohani (2013) reveals that individuals and companies with higher levels of education are more inclined to embrace green technology in their business operations.

Green Energy & Malaysia

According to Syed Shah Alam et al. (2013), Malaysia possesses significant potential in sustainable renewable energy, particularly in the realm of green energy. However, for green energy (GE) technology to be widely implemented across Malaysia, there needs to be a substantial shift in public opinion towards its adoption. Syed Shah Alam et al. (2013) also highlight several challenges associated with the implementation of GE technology. These challenges include high costs, the long-term sustainability of such initiatives, resistance from the public, socio-political factors, and the adaptation of GE technology alongside existing energy sources.

In the implementation of Green Energy (GE) in the military, the acceptance of consumers is also crucial for achieving widespread adoption throughout the entire military infrastructure. Zailin Zainal Ariffin et al. (2022) point out that Renewable Energy (RE) becomes more appealing when consumers are aware of the environmental issues and cost reductions associated with transforming Malaysia's existing energy sources into new, more sustainable alternatives. Additionally, Islam et al. (2022) argue that sustainability and the assurance of energy supply security and reliability depend on diversifying energy sources. This diversification is essential to ensure that the military sector

is not overly reliant on a single energy source. Malaysia must not only consider environmental concerns but also focus on how to enhance its position in the international military market and move up the value chain.

RESEARCH METHODOLOGY

In this research, an attempt was made to determine the effectiveness of green technologies in the development of military equipment and to explore the challenges encountered during policy implementation. To achieve this, a qualitative approach was employed. This paper adopted a qualitative research methodology, which included semi-structured interviews. These interviews were conducted to gain deeper insights into the situations related to military equipment.

Table 1: List of participants in interview session

List participant	Name of Participation	Position	Agency
Participant 1	Dr. Tuan Sabri bin Tuan Mat	Ketua Sel Kripto	MOSEP, Pusat Penyelidikan SPEKTRUM
Participant 2	Laskar Udara Nur Izatul Hanania binti Mohd Zakila	Pegawai	Bahagian Logistik Pertahanan - Markas Angkatan Tentera
Participant 3	Kpl Muhammad Nur Iman bin Norzilan	Staf	Bahagian Logistik Pertahanan - Markas Angkatan Tentera
Participant 4	Mohd Fauzi bin Mohamad Akhir	Pegawai Penyelidik	MOSEP, Pusat Penyelidikan SPEKTRUM
Participant 5	Hj Saidin bin Abd Rahman	Pegawai Penyelidik	MOSEP, Pusat Penyelidikan SPEKTRUM
Participant 6	LT DYA Nur Najib bin Sharir Zaaba TLDM	Pegawai	Bahagian Logistik Pertahanan - Markas Angkatan Tentera

However, it is important to note that some scholars have expressed reservations about the use of qualitative methods due to potential biases in data collection. To address this concern, this study employed triangulation and data validation techniques to enhance the reliability of the collected data. In this research, triangulation was achieved through various data collection methods. Comprehensive data was gathered from different sources, including formal individual interviews, journals, and government data. To mitigate potential data inconsistencies, these sources were cross-referenced with various types of data sources that were considered more credible and reliable.

Additionally, the examination of green technology within the defense industry was carried out using secondary data at a macro level. This existing knowledge base played a pivotal role in enhancing the research's understanding of green technology in the context of military energy. Various materials related to climate change were scrutinized, with sources encompassing reports, publications, information from the Ministry of Defence (MINDEF), the Malaysian Green Technology Corporation (MGTC), the Ministry of Energy and Natural Resources (KeTSA), and primarily, existing literature. This extensive information-gathering process encompassed topics such as renewable energy, green technology, Malaysian military equipment, the impacts of green

technology, and the broader context of green technology in military equipment. These data sources were instrumental in identifying issues and shaping the research's objectives.

RESULT AND DISCUSSION

Challenges in implementing Green Technology in Malaysia's Military

Green technology in Malaysia has made significant strides across various sectors, including health, education, transportation, and energy. However, the focus on the military sector has been relatively limited (Zaboon & Salih, 2021). Even with the establishment of the Green Technology Plan (GTMP) during the Eleventh Malaysia Plan (2016 - 2020), which prioritizes green growth in energy, transportation, economy, manufacturing, and social aspects (Ministry of Energy, Technology, and Water Malaysia, 2017); the military sector's integration of green technology remains modest. A noteworthy trend can be observed in Malaysia's GDP from 2000 to 2016, where total spending on Science, Research & Development for scientific research and innovation increased from 0.5% in 2000 to 1.4% in 2016. These investments were primarily directed toward areas such as bio-agriculture and health food programs (Zaboon & Salih, 2021).

A study conducted by Teoh et al. (2020) investigated public opinions and knowledge regarding Green Energy (GE) technologies, particularly Photovoltaic panels (PV). The research results revealed that a majority of the participants (90%) possessed knowledge about GE technologies and recognized the importance and benefits of PV panels. However, when the participants were informed about the costs associated with PV panels, their reactions were largely characterized by astonishment. In summary, the study indicated that Malaysians had a significant awareness and knowledge of GE technologies but faced limitations in implementing or adopting the technology due to its high cost.

The technology gap between developed and developing countries poses a significant challenge for Malaysia in its efforts to develop new military technology. This technology gap encompasses various challenges, including a shortage of qualified human resources, limited investments, and national regulations and controls (Baek et al., 1989). At present, Malaysia is classified as a 'third-tier' country in terms of arm production and is considered a 'low-tech' nation. This classification is due to Malaysia's ability to produce only a limited range of military equipment, such as small arms, ammunition, small-sized ships, and armored vehicles (Amiruddin et al., 2020). As highlighted by Balakrishnan (2008), the widening technology gap between developing and developed countries can be attributed to insufficient investment, lack of expertise, and limited national interest, despite significant proportions of national budgets being allocated to defense.

Understanding the financial challenges facing Malaysia's investment in Green Energy (GE) technology reveals that significant barriers still exist. For instance, the installation of solar PV panels in buildings with the smallest systems of 4kWp can cost approximately RM 40,000, and the return on investment is estimated to take at least eight years (The Edge Market, 2020). Furthermore, Chew (2019) pointed out that the average price of solar systems in Malaysia is higher compared to neighboring countries, primarily due to the country's relatively high cost of living. On average, a solar panel costs almost RM 15,000. To promote the adoption of solar panels, Malaysia has initiated the Large Scale Solar program (LSS). However, this program has encountered challenges, with project costs increasing by 30% to 40% in 2020. Additionally, the expansion of LSS to LSS4 projects had to be extended to March 2022 (Aziz, A. 2022).

In terms of budget allocation, Malaysia's national defense budget in 2019 experienced a significant reduction, reaching its lowest point at RM 5.9 billion, which represented a 40% decrease from the 2018 allocation budget. Out of the total budget, RM 1.3 billion was allocated for operational expenditures, while the remainder was designated for development (Kementerian Kewangan Malaysia, 2018). This reduction was deemed unavoidable due to the government's focus at the time on eliminating the national budget deficit and reducing sovereign debt, as explained by Lim Guan Eng, who served as the Finance Minister of Malaysia (Berita Harian, 2019).

Matthew's research (2021) aligns with this budgetary trend, highlighting that Malaysia primarily directs its defense industry budget toward upgrading, repair, and maintenance without relying on foreign assistance. Despite limited resources, Malaysia maintains its commitment to developing a self-reliant defense industry, with a focus on logistic support and maintenance, a strategic approach that has been in place since 1957. In contrast, the 2023 Malaysia annual budget has allocated approximately RM 17.4 billion for the Ministry of Defence. However, Salawati Mat Basir, a lecturer at the National Defence Education Centre, contends that this budget falls short and is only sufficient for maintaining existing equipment (Free Malaysia Today, 2022). Despite being classified as a "strategic industry," the defense sector continues to exist to support the Malaysia Armed Force (MAF) in acquiring modern equipment and achieving self-sufficiency (Yahaya, 2019). This demonstrates that the Malaysian military has taken the initiative to modernize its equipment and adhere to the principle of self-reliance. Nevertheless, the most significant challenges revolve around the allocation of budgetary resources for research and development as well as modernization.

Issues faced by MINDEF in processing high tech military equipment

Military equipment refers to a collection of weapons, arms, and supplies readily employed for the application of lethal force in response to actual or perceived threats. As the world transitioned from the atomic era, nearly all countries embarked on the acquisition of high-tech advanced military technologies to engage in warfare and safeguard their nations. In general, Malaysia can be categorized as a "third-tier" arms producer, somewhat considered a "low-tech" country in this regard. Malaysia's defense industry originated with a focus on aircraft maintenance and repairs but has since expanded into various sectors, including weaponry, information and communication technology, automotive, and maritime. However, the defense industry in Malaysia faces numerous formidable challenges that must be overcome to continue its development.

Starting in 1986, Malaysia actively promoted private industry participation in the defense sector, leading to the privatization of several government enterprises. In the realm of defense, privatization primarily took the form of Non-Financial Public Enterprises, which maintained a certain degree of government oversight while encouraging the adoption of private sector technology. In 1982, the Defence Industry Division introduced the National Defence Production Policy (NDPP), which categorized defense products into three groups: "strategic," "essential," and "non-strategic." The NDPP recognized the need for self-reliance in producing strategic items independently while leaving non-strategic products to be manufactured by semi-government organizations and the private sector.

To summarize the issues faced by the Ministry of Defence (Mindef) in implementing green technology:

1. **Low Demand from the Malaysian Armed Forces (MAF):** There has been a challenge in generating sufficient demand for green technology solutions within the MAF, which may affect the adoption of these technologies.
2. **Lack of Economies of Scale:** The private sector in Malaysia's defense industry faces difficulties in achieving economies of scale, making the production of green technology solutions less cost-effective.
3. **Allocation of Budget to Imports:** A significant portion of the military budget has historically been allocated to the importation of weapons systems, leaving limited resources for investing in domestic green technology development.
4. **Recommendation for International Partnerships:** In 1997, the defense minister recommended developing the defense industry through closer partnerships with businesses in ASEAN nations and Western countries, suggesting a need for external collaboration.
5. **Efforts to Strengthen Technology Transfer:** The government has taken steps to enhance the technology transfer component of trade agreements and expand the supplier base to facilitate green technology adoption in the defense manufacturing sector.

These challenges indicate the complexity of implementing green technology in Malaysia's defense industry and highlight the need for strategic planning and international cooperation to address them effectively.

Foreign Reliance

The information provided by research participants indicates that Malaysia has been actively seeking to reduce its dependency on defense imports and develop its domestic defense industry. Some key points from this information include:

1. **Limited Defense Exports:** Malaysia's defense exports were minimal from 2012 to 2017, highlighting the need to enhance domestic defense industry capabilities.
2. **Reducing Dependency on Imports:** The main objective is to reduce reliance on defense imports by strengthening domestic capabilities.
3. **Strategic Partnerships:** Malaysia has entered into strategic partnerships with various companies, both local and international, to enhance its defense-related products and technologies.
4. **Government Involvement:** Many of these partnerships involve some level of government participation, including shareholdings, indicating a role for the government in managing and supporting these initiatives.

5. Maintenance and Dockyard Facilities: Malaysia has established joint ventures and facilities for the maintenance and repair of military equipment, including aircraft and naval vessels.

Overall, Malaysia's efforts to develop its domestic defense industry involve collaboration with various partners and aim to enhance its self-reliance in defense production and maintenance. In the end, this strategic partnership has highlighted that Malaysia is still not self-sufficient. According to the National Defence White Paper of 2020, Malaysia has had to acknowledge the influence of the United States, China, and Japan on the development of the Asia-Pacific region. In this context, Malaysia also emphasizes the protection and defense of its territories from both internal and external threats, even as these strategies may reduce efforts to achieve self-sufficiency. For many years, Malaysia's defense industry was largely neglected, relying heavily on foreign suppliers for its military hardware. In the early 1980s, defense strategists emphasized the need for a long-term strategy to achieve self-sufficiency (Defence White Paper, 2020). Balakrishnan (2008) further explained that by early 1984, Malaysia had developed local small arms production capabilities sufficient to meet the majority of its armed forces' small arms, ordnance, and ammunition needs. Since the domestic industry was not yet considered ready for offset programs in the 1980s, counter-purchases were the most common form of offset in Malaysia. However, to establish domestic manufacturing of assault rifles, intended to be a joint venture between a government-owned firm and a foreign arms manufacturer, a task force was formed in mid-1983. The decision was made to prioritize domestic production for military purposes rather than economic considerations, even though rifles could be purchased more cost-effectively on the global market. The government made the decision to privatise several military sites in 1970. Back then, the main goal was to establish a domestic defence sector to support the country's aim to adopt a defensive posture of self-reliance (Pike, J. 2022). This plan also aided the national aim of building up capability in high-tech industries like aerospace. In 1972, Malaysia began by privatising the maintenance and repair facilities at the Armed Force Base, currently known as AIROD (Ananthan, S. & Inderjit, S. 2014). Following this, the PSD Naval Dockyard in Navy Base Lumut, now known as Boustead Naval Shipyard sdn.bhd, was privatised in 1997.

Furthermore, Sapura collaborated with the French company Thales to develop the TCR 5100 radio. The Malaysian Armed Forces have adopted this radio, and it is also supplied to countries including Pakistan, Indonesia, Venezuela, and India, as reported in the SAPURA Annual Reports for 2021. Additionally, AIROD has emerged as the world's most certified C-130 center, specializing in structural repair, tanker conversion, stretch modification, and landing gear maintenance. Another notable company, Achromatic, possesses internal simulator development capabilities.

Ensuring army mobility, especially in communication, is crucial in Malaysia's tropical climate, where heavy rainfall is common throughout the year. Factors such as receiver sensitivity, bandwidth, power, and losses need to be carefully correlated. Military forces frequently change their locations, whether in Taman Negara's jungles or other specific areas, making satellite communication equipment essential. Additionally, understanding the power requirements for SATCOM equipment is vital for safe operations (Akhtaruzzaman et al., 2020).

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their locations, whether in Taman Negara's jungles or other specific areas, making satellite communication equipment essential. Additionally, understanding the power requirements for SATCOM equipment is vital for safe operations (Akhtaruzzaman et al., 2020).

On October 22, 2022, Malaysian Defense reportedly added new assets as part of a repeated order to further enhance defense capabilities. The newly acquired weapons include 72 units of 81mm mortars, 27 units of 40mm Multiple Grenade Launchers, 150 units of Light Anti-Tank Weapons (Short), and 98 Assault Boats (News 2022). Over the past few years, Malaysia has actively expanded its military weaponry stock while concurrently developing its own defense industry. The Malaysian Defense White Paper also outlines the nation's commitment to reducing dependency on foreign defense assets, a goal that is currently in progress.

In 2019, Malaysia explored the possibility of using its abundant natural resource, palm oil, as a potential payment method in collaborations with China, Russia, Pakistan, Turkey, and Iran. This initiative aimed to diversify revenue sources for upgrading Malaysia's military equipment (Reuters, 2019). Former Defence Minister Mohamad Sabu emphasized Malaysia's wealth of natural resources, particularly palm oil, as a potential means of payment rather than solely relying on these resources for military research and development. However, discussions on this matter have been stalled due to internal governmental changes and have not progressed to date. Malaysia continues to grapple with various challenges in the realm of national defense, which will be analysed in this paper. Despite progress, Malaysia still faces issues stemming from its status as a developing nation and an end-user, which in turn gives rise to other challenges. As evident from the inventory list, Malaysia retains out-dated equipment, necessitating on-going maintenance and repairs, resulting in increased costs. Moreover, the government's budget allocation for defense remains limited year after year, constraining the Ministry of Defence (MINDEF) from pursuing new initiatives and advancements in the military sector.

Maintenance

According to Harz (1981), army regulations mandate a comprehensive inspection of a vehicle by the crew before, during, and after operation. If unit maintenance personnel fail to perform regular vehicle servicing properly, potential problems may arise, leading to the gradual degradation of the vehicle due to the cumulative effects of contaminated lubrication, coolant, and carburetion systems (Harz, 1981).

Malaysia had the opportunity to acquire advanced aircraft but faced a choice between purchasing from the USA or Russia. In 2003, Malaysia opted to buy 18 Russian fighter jets, specifically the Sukhoi Su-30 MM, instead of Boeing Hornets from the USA. This decision was motivated by the desire to secure a more cost-effective deal at that time. However, challenges arose when it came to maintenance because Malaysia was the sole user of the Sukhoi Su-30 MM. This is reflected in the expenditure budget allocated to the Ministry of Defence (MINDEF), which accounts for approximately 4% to 6% of the total federal government budget, amounting to around RM 13 billion to RM 17 billion (Lee, 2022).

Since 1970, the Ministry of Defence has been actively developing the national defense, science, technology, and industrial infrastructure to ensure the capability for maintaining, repairing, and overhauling (MRO) all military assets and equipment. Despite the defense white paper policy, the implementation of MRO remains challenging due to difficulties in obtaining spare parts, largely

stemming from strategic partnerships with producer countries. These producer countries, such as the USA, China, and France, constantly upgrade their products, leading to frequent changes in spare parts. As noted by Syed Abdul Haris et al. (2020), many of the assets purchased by the government in the 1970s through the 1990s are now outdated but still remain in the Malaysian Armed Forces (MAF) inventory.

Nevertheless, Malaysia has taken initiatives to develop local production in line with the country's specific needs. In recent years, Malaysia has made strides in reducing its reliance on foreign military vehicle supplies by developing its own Armoured Vehicles (HMAV4 4x4). These vehicles are equipped with advanced artillery, grenade, and mine blast functions. Mildef International Technologies, specializing in providing automotive services for the defense industry, has played a crucial role in resolving the issue of foreign supply of spare parts. The vehicles also feature Remote Control Weapon Stations (RCWS), allowing them to engage in firefights while on the move (Svalstedt, 2022).

However, as Former Prime Minister Ismail Sabri Yaakob and the former Ministry of Defence have noted, the development primarily considers Malaysia's unique environment, and entering the international market may require additional time. The current development project has already spanned four years and incurred costs of RM 16 million (Bernama, 2021).

While there's no doubt that the Malaysian Armed Forces (ATM) need to invest in the latest technology, the delays encountered in projects like the LCS highlight the importance of maintaining and upgrading existing equipment. This is crucial to ensure their continued functionality until new technology is delivered. Equipping ATM with advanced assets aligns with the national defense policy founded on a perimeter deterrence strategy. Such an approach not only enhances defense capabilities but also safeguards the nation's interests and sovereignty.

Presently, the Ministry of Defence (MinDef) maintains a strong focus on Maintenance, Repair, and Overhaul (MRO) for all assets. However, the adoption of Green Government Procurement (GGP) was expanded to encompass all government agencies in 2017. The Ministry of Defense (MinDef) is among the organizations mandating that separate ministries consider green requirements when purchasing products falling under the GGP categories.

4.5 Budget

Due to its increasing economic significance, Malaysia has become one of the key political players in Southeast Asia. Despite a reduction in defense funding during the 1997–1998 economic crisis, the nation remains committed to modernizing and strengthening its armed forces. The discussion on defense spending revolves around whether Malaysia is allocating an appropriate amount to safeguard its sovereignty. This is distinct from the findings of the Stockholm International Peace Research Institute (SIPRI) report, which noted a historic increase in global military spending in 2021, surpassing US\$2 trillion. The top spenders in this global context were The United States, China, India, the United Kingdom, and Russia, collectively constituting 62% of the total expenditure (SIPRI, 2021). The planning of defense budgets and the procurement of weapons are conducted as part of broader budgeting processes involving various agencies and ministries.

According to Rajamayagam, these budgeting processes are subject to equivalent controls and screening procedures for financial accountability. However, the question of opportunity costs

remains unanswered, and there is no apparent public mechanism for determining the adequacy of defense expenditure or the allocation of a fair share of the national budget in the context of national security. In terms of allocation Operating expenditure makes up the bulk of the annual defence budget at about 70% to 80%, while the rest goes up to development expenditure. However, the budget for assessments under development shows that annual relative spending is declining has recommended a 2022 defence expenditure of MYR16.14 billion for the 2022 MiNDEF budget (USD3.9 billion).The allocation represents a 1.8% increase over the original allocation in 2021 of MYR15.86 billion.

Malaysia Military spending/Budget Data (2016-2022)		
Year	Billion USD	% GDP
2022	3.9B	1.8%
2021	3.83B	1.06%
2020	3.81B	1.14%
2019	3.77B	1.03%
2018	3.45B	0.96%
2017	3.49B	1.10%
2016	4.17B	1.38%

Table 2: Malaysia Military spending/budget Data (2016-2022)
(Data Sources: World Bank)

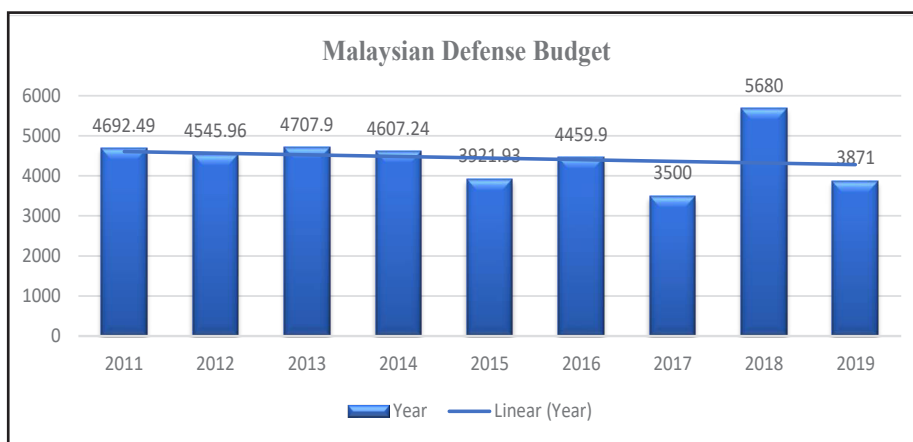


Figure 1: Malaysia Military spending / Budget Data (2016 – 2019) USD \$
(Data Sources: Malaysian Annual Budget Plan)

According to the graph above, Malaysia's military expenditure was 1.38% of its gross domestic product (GDP) in 2016 but decreased to 1.1% of GDP the following year, where it has remained for the past few years. Trend Economy (2010 – 2021) reports that Malaysia's military arsenal consists of a wide range of imported weapons. Since 2010, the largest exporters of military hardware to Malaysia have been France, Germany, Spain, and Turkey. The effort to modernize the Malaysian Army gained momentum after the nation's recovery from the economic crisis of 1997. This modernization included the acquisition of Army Main Battle Tanks, Armoured Personnel

Carriers, Infantry Fighting Vehicles, and contemporary weaponry, bolstering the army's status as one of the region's more formidable forces (Shah, 2020).

The Malaysian government has been committed to strengthening naval security. Following the completion of the New Generation Patrol Vessel program, the Royal Malaysian Navy initiated the Second Generation Patrol Vessel program, aiming to acquire a batch of Littoral Mission Ships and Multi-Role Support Ships (Abas, 2022). In addition, there is an ongoing program to enhance and extend the service lives of previous ships, ensuring that the inventory remains equipped with the latest technologies.

However, challenges have arisen in the completion of the Littoral Combat Ship (LCS) project, both in terms of schedule and budget. The construction of these ships was intended to bolster the country's and the navy's defenses. The project has been noted as the largest defense budget in Malaysian history, with a total cost of RM 9 billion. According to the Public Accounts Committee (PAC), despite the government's expenditure of approximately RM 6.08 billion, not a single ship has been completed (Parlimen Malaysia, 2020). Nonetheless, the government remains committed to the project, viewing it as an asset essential to the nation's sovereignty and its efforts to address conventional security concerns.

According to Abdul Rahman (2021), historically, the Royal Malaysian Air Force (RMAF) primarily sourced its acquisitions from the United States and Europe in the West. However, as noted by David (1986), the United States' restrictions on delivering 'new technology' to the region prompted RMAF to explore imports from Russia and other unconventional suppliers. As a result, RMAF now operates a unique fleet of aircraft originating from America, Europe, and Russia. The Malaysian Armed Forces (MAF) play a crucial role in safeguarding the country's air, sea, and land defenses. In 2018, Malaysia's military power ranked 44th out of 136 nations. However, several challenges and circumstances contribute to the suboptimal logistical management of soldiers, with the primary issue being insufficient budget allocation. To enhance MAF logistics efficiency and implement green technologies, the government must consider increasing the budget and formulating a strategic plan for research and development, encompassing both current resources and future security needs.

Conclusion and Recommendation

In line with the Defence White Paper (DWP), the Malaysian Armed Forces (MAF) recognizes the imperative of adapting to an ever-changing security environment. During the DWP period, the MAF's force size will remain constant, but a strategic shift involving repurposing and re-prioritization will be undertaken to align with future requirements. The national defense ecosystem encompasses various elements, including heightened awareness of the volatile security landscape, increased collaboration among the MAF and other security agencies, and partnerships with external entities.

In contemporary security considerations, the depletion of natural gas assumes significance as a national security concern. Malaysia's long-standing reliance on the oil and gas (O&G) industry has multifaceted implications. Notably, a substantial portion of the state's revenue is derived from this sector. Several factors contribute to this dependency, including the expansion of Malaysia's economy relative to the O&G sector, periodic price shocks, and structural challenges within the fossil fuel industry (ISEAS, 2022). Additionally, the unpredictable fiscal contribution of the

O&G sector complicates matters further. Various supply, demand, and public policy variables, such as interest rates, natural disasters, political instability, and OPEC decisions, influence oil prices. Recent global experiences have demonstrated that unforeseen health and economic crises can exacerbate this volatility. The inherent cyclical nature of oil price fluctuations exacerbates the issue.

In the course of this research, the findings underscore the challenges Malaysia faces in implementing green technology as a new strategy for future security. Overall, the Ministry of Defence (MINDEF) continues to grapple with persistent issues, including budget constraints, dependence as an end user, and difficulties in maintaining existing assets. Malaysia faces various defense-related challenges, including its status as a third-tier country and an end buyer. As evidenced by the inventory list, Malaysia retains older equipment, incurring significant maintenance and repair costs. Yearly budget allocations remain constrained, making it challenging for MINDEF to embark on new initiatives for the military's future.

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INDIA'S HYBRID WARFARE IN BALOCHISTAN: CHALLENGES AND WAY FORWARD FOR PAKISTAN

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ABSTRACT

The 21st century has witnessed a significant transformation in the nature of military threats, driven primarily by the escalating utilisation of non-kinetic strategies by adversaries to advance their objectives. This paradigm shift is epitomised by the emergence of hybrid warfare, which amalgamates both kinetic and non-kinetic instruments of warfare, with its overarching objective being the erosion of the morale of the adversary as opposed to outright military victory. The study aims to uncover India's strategy against Pakistan through the lens of hybrid warfare. The study is qualitative, using the library method to answer the research question of how India has potentially deployed a hybrid warfare strategy against Balochistan. Following Pakistan's international claims of Indian interference in the Balochistan province, the 2016 arrest of Indian Navy Officer Kulbhushan Yadav provided substantial evidence of India's purported espionage activities and support to insurgents in the area. The study posits that under the Modi government, India has sought to robustly counter Pakistan's growing influence in South Asia, particularly in the backdrop of the China-Pakistan Economic Corridor (CPEC) and other regional partnerships with China. In this strategic matrix, Balochistan emerges as a critical focal point, enabling India to potentially disrupt China's ambitions in Central Asia and Afghanistan by considering Balochistan as a battleground for a proxy conflict. In the 21st century, military threats have evolved, notably through the rise of hybrid warfare, which blends kinetic and non-kinetic strategies, emphasizing undermining adversary morale. This research, adopting a qualitative approach via the library method, explores India's potential hybrid warfare strategy in Balochistan against Pakistan. After Pakistan's international claims of Indian interference in Balochistan, the 2016 arrest of Indian Navy Officer Kulbhushan Yadav highlighted alleged Indian espionage and support to insurgents. The study suggests that under the Modi government, India aims to counter Pakistan's expanding influence in South Asia, particularly against the backdrop of China-Pakistan collaborations like the CPEC. Within this framework, Balochistan is crucial, possibly serving as India's battleground for a proxy war aimed at disrupting China's Central Asian ambitions. To effectively safeguard against external intrusions and the perils of hybrid warfare, it is imperative for Pakistan to bolster its surveillance and intelligence capabilities for early detection of covert activities. Furthermore, Pakistan should prioritise socio-economic advancement. This prioritisation should involve initiatives in healthcare, education, and employment, with tribal leaders playing a critical role in collaborating with the government to address internal challenges.

KEYWORDS: *hybrid warfare, kinetic, non-kinetic warfare, Pakistan, Balochistan, India*

INTRODUCTION

Hybrid warfare is a multifaceted strategic approach characterised by the amalgamation of both conventional and unconventional methods of warfare. This approach involves various combinations of state and non-state actors working together to achieve a spectrum of objectives encompassing not only political but also security, economic, and social dimensions (Dayspring, 2015). The determination of hybrid warfare is contingent upon several factors, including the belligerent nature of the state, the presence of specific conditions, and the utilisation of non-conventional means beyond the military sphere. Hybrid warfare is fundamentally oriented towards realising strategic objectives, where states employ a range of tactics, tools, and techniques within a hybrid threat environment to fulfil their goals.

India's involvement in hybrid warfare with Pakistan traces its origins back to the 1971 conflict, during which India provided substantial support, funding, and training to the Mukti Bahini, ultimately resulting in the separation of East Pakistan. Balochistan, the largest province of Pakistan in terms of land area, shares borders with Iran's Balochistan-Sistan province to the southwest, as well as Afghanistan to the north and northwest. Its strategic significance lies in serving as a gateway to the Middle East, Central Asia, and South Asia. Balochistan boasts a substantial coastline, rich in untapped resources such as copper, coal, gold, uranium, gas, and oil (Iqbal, 2012). However, internal complexities, vulnerabilities, and economic and political marginalisation have created opportunities for external interference in the province. Pakistan has raised international concerns about Indian interference in Balochistan, with explicit references made by Prime Minister Narendra Modi in his Independence Day speech in 2016 and statements from National Security Advisor Ajit Doval highlighting India's intent to exploit these vulnerabilities.

China-Pakistan Economic Corridor (CPEC), a project under the Belt and Road Initiative (BRI), has become a grave concern for India. Since its inception in 2015, the Modi government has intensified efforts to counter Pakistan comprehensively, including its growing influence in South Asia through the CPEC. This strategic initiative not only bolstered Pakistan's regional stature through collaboration with China but also positioned Balochistan as a potential lever for India to counter China's influence in the Central Asian Republics and Afghanistan. The proximity of Gwadar to the Chabahar Port further underscores India's interest in limiting China's reach. India's endeavours to counter China and assert itself as a South Asian hegemon while simultaneously weakening Pakistan politically, socially, and economically are pivotal elements in India's broader strategic calculus aimed at expanding its influence and confronting its adversaries.

This study adopts a qualitative research approach, utilising library-based research methods to elucidate the extent of India's involvement in the internal affairs of Pakistan, with a specific focus on the province of Balochistan. The primary objective of this research is to discern and analyse the patterns and strategies employed by India in its engagement with Balochistan, aiming to influence threat perceptions and garner support among the local population to undermine Pakistan's security and stability. The present research study exerts a significant positive influence by establishing a seminal trend within the realm of academic inquiry. Prior to this investigation, the topic of Indian hybrid warfare techniques directed towards Balochistan and Pakistan's corresponding responses had remained largely unexplored in scholarly discourse. The research endeavour at hand, therefore, has assumed a pioneering role by offering an initial foray into this hitherto underexplored subject matter. Consequently, it furnishes an essential foundation for subsequent in-depth investigations that seek to delve further into the multifaceted dimensions of Indian involvement and the evolving nature of warfare strategies in Balochistan.

GEOSTRATEGIC SIGNIFICANCE OF BALOCHISTAN

Balochistan is the largest province in terms of land area among the country's four provinces and boasts a strategic geographical location, sharing its borders with Iran's Balochistan-Sistan province to the southwest and Afghanistan to the north and northwest. Additionally, it serves as a

regional crossroads, bordered by the Middle East, Central Asia, and South West Asia. Balochistan's total land area encompasses a staggering 796,000 square kilometres, constituting 44% of Pakistan's territory (Congress, 2012). Despite its enormous size, the province has a very small population, accounting for only 6% of the overall population of the country. The Baloch people make up 54.7% of the population, while Pashtuns make up 29.0%. Surprisingly, in comparison to Pakistan's other three provinces, Balochistan remains disproportionately impoverished and underdeveloped (Group, 2006). The social structure of Balochistan is profoundly anchored in a tribal system, with Sardars and Nawabs exercising authority and autonomy (Iqbal, 2012). Balochistan is a province characterised by intriguing contrasts and complexity that necessitate deeper exploration due to its unusual combination of resources and lack of development, as well as its distinct tribal system.

Balochistan's history is complicated, stretching back to the British administration of colonialism. Balochistan was divided into four princely states before its merger into Pakistan: Makran, Lasbela, Kharan, and Kalat. At the start of the partition of Pakistan and India in 1947, the British Balochistan 'Shahi Jirga' in partnership with the Quetta Municipality, unanimously accepted and signed a resolution to annex Balochistan to Pakistan. While three of the princely states acceded to Pakistan, Khan of Kalat adopted an alternative approach, proclaiming Kalat an independent state at first and preferring diplomatic engagement with Pakistan instead of rapid annexation. Subsequently, a pivotal meeting transpired between Quaid-e-Azam (the founder of Pakistan) and the Khan of Kalat, resulting in the Khan's decision to integrate Kalat into Pakistan in 1948. Notably, Makran became a district within the Balochistan province, with the exception of the Gwadar area, spanning 800 square kilometres. The Gwadar area remained under the administration of the Sultanate of Oman until its acquisition by Pakistan in September 1958. This territory was subsequently incorporated into the province of Balochistan in 1977 (Ahmed, 2019).

Presently, Balochistan comprises six divisions and thirty districts, reflecting its dynamic history of territorial expansion and integration into the broader political framework of Pakistan (Khan et al., 2012). This historical evolution underscores the intricate and multifaceted process through which Balochistan emerged as a constituent part of Pakistan.



Source: Baksh, 2021

Balochistan, occupying a distinctive strategic location, serves as a gateway to the Middle East, Central Asia, and South Asia. With a coastline spanning 756 kilometres, the province is endowed with substantial reserves of copper, coal, gold, uranium, gas, and oil. Its coastline remains largely undeveloped, while having enormous natural resources that are mostly untapped (Iqbal, 2012). Notably, Balochistan's southern boundary meets the Arabian Sea, home to the strategically significant port of Gwadar along the Makran Coast. Additionally, the province is strategically situated at the mouth of the Strait of Hormuz. Rich natural resources, including the "Hillock of Gold" in the Rickodek part of Chagi, housing the fourth-largest gold and copper deposit, further underscore the province's economic potential (Mazhar et al., 2012).

Balochistan occupies a pivotal position in the marine passage of the Indian Ocean, strategically connecting Asia's Eastern, Western, and Central divisions. The Indian Ocean has already garnered immense global attention as a focal point for major sea trade routes. The province's significance is accentuated by its military routes, with crucial naval and air force stations located in Gwadar to monitor potential military activities and exercise control over vital choke points in the Strait of Hormuz and Persian Gulf, as well as overseeing trade routes through the Indian Ocean. The province's vast natural resources, combined with its geostrategic location, have attracted the interest of regional and extra-regional actors (Javaid & Jahangir, 2015).

However, Balochistan grapples with internal conflicts and longstanding grievances of its populace concerning its relationship with the government of Pakistan. These issues have fluctuated over the years, evolving with changing political regimes. Despite various financial and development projects, the Baloch people continue to face hardships, resulting in a protracted struggle for autonomy, improved political representation, and effective governance. Given its proximity to Iran and Afghanistan, any internal turmoil or issues directly impact neighbouring nations, contributing to broader regional security concerns. Internal political vulnerabilities provide opportunities for countries like India and Afghanistan to intervene and exacerbate the conflict between the Baloch population and the Pakistani government (Hasan, 2016). India, particularly under the leadership of Narendra Modi, has intensified efforts to undermine Pakistan, especially following the commencement of the China-Pakistan Economic Corridor (CPEC), which India views as a threat to its national security. The complex interplay of geostrategic importance, internal conflicts, and external interests shapes the ongoing challenges and dynamics in Balochistan (Lie & Perwita, 2019).



Source: Ahmed, 2015

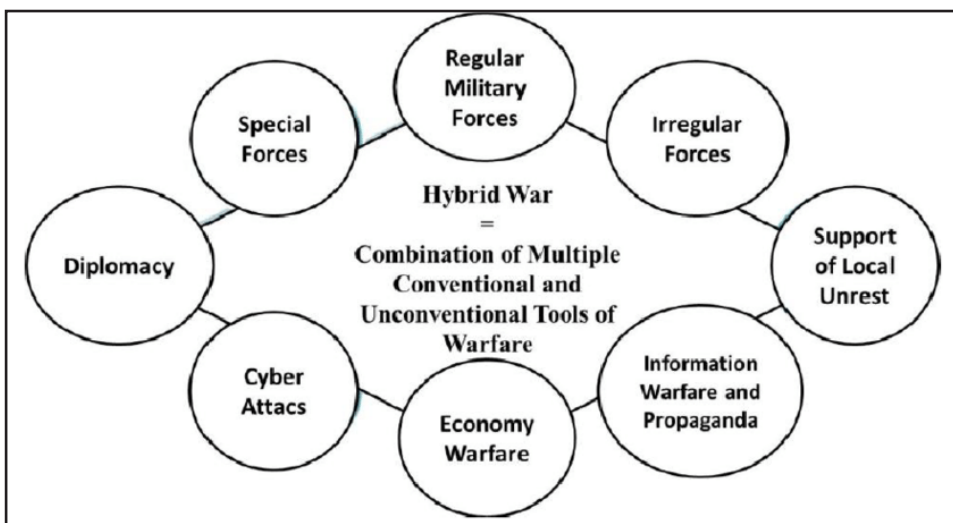
HYBRID WARFARE: THE COMPLEXITY OF MODERN STRATEGY

In the 21st century, the criteria and character of military threats have undergone a profound transformation, primarily attributed to the escalating utilisation of non-kinetic strategies by adversarial entities to advance their objectives. This shift is indicative of a complex landscape where both kinetic and non-kinetic methods of warfare challenge the ability of states to safeguard their national security and territorial integrity. The concept of hybrid threats gained prominence notably during the Hezbollah-Lebanon War of 2006 when Hezbollah achieved a degree of tangible military success against the Israel Defence Forces. Hybrid threats include a wide range of challenges that combine kinetic and non-kinetic elements, such as cyber warfare, information warfare, asymmetric conflicts involving both state and non-state actors, piracy, resource security, globalisation processes, and the proliferation of Weapons of Mass Destruction (WMDs). According to NATO's strategy, as described in the Bi-Strategic Command Capstone Concept of 2010, hybrid threats are enemies who use a combination of conventional and non-conventional tactics to achieve their goals (Bachmann & Gunneriusson, 2015).

The concept of 'Fourth Generation Warfare,' advanced by military thinker William Lind, is inextricably linked to hybrid warfare. Lind dates the origins of contemporary warfare to the Westphalian Treaty of 1648, a watershed period in history that aided the creation of nation-states and the rise of non-state entities. The Fourth Generation Warfare marks a significant departure from the Westphalian paradigm as states lose their traditional monopoly over the conduct of warfare. Frank Hoffman played a pivotal role as a military theorist who introduced the term 'hybrid warfare,' citing the Lebanon-Hezbollah War of 2006 as a prime example of hybrid warfare. Importantly, hybrid warfare can be executed by both state and non-state actors, with multifaceted activities within the hybrid threat spectrum potentially being conducted by distinct or integrated units operating within the primary theatre of conflict to achieve synergistic effects. While a universally accepted definition of hybrid warfare remains elusive, the definition proposed by Frank Hoffman holds significant traction due to its nuanced portrayal of the concept (Deshpande, 2018). Hoffman states:

"The convergence of warfare methodologies, the diversification of combatants, and the utilisation of various technologies result in a diverse and intricate phenomenon known as hybrid warfare. This type of warfare can be executed by both nation-states and various non-state entities. Hybrid warfare encompasses a spectrum of warfare approaches, encompassing conventional military capabilities, irregular tactics, and formations, acts of terrorism involving indiscriminate violence and coercion, as well as criminal disorder. These multifaceted operations may be carried out by separate units or even within the same unit, but they are generally orchestrated and coordinated operationally and tactically within the primary battleground to achieve synergistic outcomes (Hoffman, 2007)."

In contemporary times, achieving victory is not solely contingent upon the triumph of one's armed forces; rather, it hinges significantly on whose narrative prevails. Through covert and clandestine activities, adversaries tactically exploit a state's underlying social, political, and economic vulnerabilities, systematically sowing seeds of discord and division that culminate in tumultuous and often violent political transformations (Marks & Ucko, 2021). Consequently, the formulation of hybrid warfare strategies entails a multifaceted process wherein a myriad of elements come into play to shape and define these strategies.



Source: Pinker & Žilinčík, 2016

One key element of hybrid warfare is the manipulation of information and propaganda to destabilise local populations and spread baseless information, often seen in cases like India's use of fake propaganda against Pakistan. Covert operations, including espionage and subversion, are another major component, pressuring target governments to take ill-advised actions and causing disruption in their responses. Special Armed Forces (SAF) can be used to regulate certain situations, particularly in smaller operations. Furthermore, the logistical and financial support of terrorist organisations plays a crucial role, allowing states to carry out destabilising acts while preserving plausible deniability. Furthermore, extremist groups, both ethnic and religious, are organised with governmental support to cause political and social disorder. Economic pressure, such as poor economic settlements and poverty, contributes to nation destabilisation, while manipulation of democratic institutions can cause political upheaval and social unrest (Babar & Mirza, 2020).

Hybrid warfare is distinct from traditional warfare in its versatility and reliance on a range of methods. It can involve state and non-state actors cooperating or acting independently, with the ability to change strategy as needed. Definitions of the European Union (EU) emphasise states' coordinated use of diplomacy, military action, economic measures, and technology to achieve their goals. The state is the major actor in hybrid warfare, deciding overall strategy, yet achieving success requires striking a balance between methods and state capabilities. While hybrid warfare is a new idea, its practices have historical precedents, such as the deployment of hybrid warfare to defeat Hezbollah during the 2006 Lebanon war and Russia's tactics during the Crimean annexation. States must build their own hybrid technology, foster cooperation, provide analytical support to institutions, educate and train agencies, and construct organisational structures to effectively defeat hybrid warfare. In a world with rising displacement and rebel groups, hybrid warfare has evolved beyond traditional guerrilla tactics into a more complicated and impactful strategy (Caliskan & Cramers, 2018).

In its relations with Pakistan, India has used hybrid warfare methods, notably in relation to the situation in Balochistan. On the basis of credible evidence, India has used hybrid warfare elements to incite unrest in Balochistan and destabilise Pakistan. This includes alleged support for

separatist groups and giving Baloch nationalist leaders a platform to express their apprehensions against Pakistan. India's information warfare techniques have also been blamed for spreading propaganda and misinformation to create unrest in Balochistan via media outlets and social media. Concerns have been expressed concerning the potential use of hybrid warfare techniques to undermine Pakistan's stability and territorial integrity.

INDIA'S STRATEGIC INTERESTS IN BALOCHISTAN

India's engagement in Pakistan's domestic affairs is a historical phenomenon with origins that can be traced back to crucial events in the region's history. Notably, India's involvement in hybrid warfare and its impact on Pakistan can be traced back to the 1971 conflict, when India actively sponsored, funded, and trained the Mukti Bahini, a step that helped East Pakistan's independence (Arain, 2021). India's historical inclination for extending influence into neighbouring territories is well documented, with instances of espionage systems dating back to the era of Kautilya, when gathering information about neighbouring countries and potential adversaries was a strategic imperative (Saad & Wenxiang, 2020). However, the geostrategic significance of Pakistan in the South Asian region has made it an attractive partner for China, further contributing to the complexity of regional dynamics. China's overtures toward Pakistan extend beyond mere economic interests, as it seeks to counterbalance India's growing influence in South Asia. As China emerges as a prominent Asian superpower, it is inclined to expand its sphere of influence, and countering India's regional dominance is a central objective (Ghiasi, 2021).

Moreover, the China-Pakistan Economic Corridor (CPEC), a flagship project under the Belt and Road Initiative (BRI), has heightened India's concerns. Since the initiation of the CPEC in 2015, the Indian government, under the leadership of Prime Minister Modi, has intensified efforts to counter Pakistan's growing stature in South Asia, particularly within the framework of the CPEC. This ambitious project not only bolsters Pakistan's economy but also strengthens its regional standing through collaboration with China. However, India perceives an opportunity to disrupt China's access to Central Asian Republics and Afghanistan via Balochistan. The strategic location of Gwadar, in proximity to the Chabahar Port, offers India a means to limit China's influence.

Beyond India's geostrategic and economic interests, its approach appears to align with the principles of Kautilya, wherein immediate neighbours are viewed as potential adversaries and extended neighbours as potential allies. Indian Defence Minister AK Antony, in a 2013 press conference, expressed India's apprehension over Pakistan's ceding of control of the Gwadar port to China, underscoring the strategic significance of this development (Afp, 2013). India's continued engagement in Balochistan, especially following the Mumbai attacks, has been a subject of scrutiny and is frequently justified by the activities of the Research and Analysis Wing (RAW), India's external intelligence agency (Khetran, 2017). These multifaceted dynamics underscore the intricate interplay of geostrategic imperatives and regional power dynamics shaping India's involvement in Pakistan.

India's Hybrid Warfare in Balochistan

Sun Tzu, a renowned expert on warfare, articulated that the highest form of excellence in conflict lies not in the conquest of one's adversaries but in subduing the enemy's resistance without resorting to direct confrontation (Giles, 2002). In the context of Balochistan, a province riddled

with internal complexities, vulnerabilities, and political-economic alienation, external actors have found fertile ground for interference. The Government of Pakistan has vigorously raised international concerns, highlighting India's alleged involvement in Balochistan. Key indicators of India's strategic intent emerged during Prime Minister Narendra Modi's Independence Day speech on 15th August, 2016, where he made explicit references to Balochistan. Additionally, National Security Advisor Ajit Doval's articulations within the context of Pakistan further underscored India's interest in leveraging the province's vulnerabilities for its strategic advantage. Notably, in a statement dating back to 2014, Ajit Doval emphasised India's familiarity with strategic subtleties, ruling out the possibility of nuclear conflict with Pakistan and hinting at a more nuanced approach (Khetran, 2017). This prompts the question: why has India chosen to play the Balochistan card? Officials contend that India's strategic calculus revolves around disrupting the China-Pakistan Economic Corridor (CPEC), a project of immense geostrategic importance (Willasey-Wilsey, 2016).

It is crucial to grasp that hybrid warfare's objective is not merely the defeat of the adversary on the battlefield but the erosion of the adversary's morale and resilience. Within this context, Pakistan faces a pressing imperative to comprehend the multifaceted threats posed by hybrid warfare, especially as it grapples with destabilisation efforts that challenge its stability and prospects for the future.

A recent event highlighting this challenge was the exposure of India's espionage activities in Islamabad. The discovery led to the expulsion of eight members of the Indian High Commission. Their activities were exposed, revealing their alleged involvement in fomenting unrest in Pakistan on behalf of their intelligence bureau. Subsequent revelations from Pakistan's Foreign Office suggested their connections with Tehrik-e-Taliban Pakistan (TTP) and claims of support for Baloch separatists and the TTP to destabilize Pakistan from across the border in Afghanistan. Afghanistan is believed to serve as a facilitator for the Balochistan insurgency, with India allegedly utilising Afghan soil to channel funds, deploy troops, and supply weapons to insurgent groups. Notably, the case of Indian Navy Officer Kulbhushan Yadav stands as a concrete example of India's involvement in Balochistan (Khetran, 2017). More recently, a tragic incident occurred on 30th September 2023, when a suicide bomber targeted a mosque in Mastung, Balochistan, claiming 59 lives. Pakistan's Interior Minister, Sarfaraz Bugti, attributed the attack to the Indian intelligence agency, RAW, reiterating longstanding Pakistani claims of Indian subversion within its borders, particularly in Balochistan (Ahmed, 2023).

This evolving scenario illuminates the intricate maze of hybrid warfare, with Balochistan epitomising the geopolitical crosshairs. The subsequent section will delve into the specific hybrid warfare strategies India is alleged to have deployed in Balochistan.

Support to Insurgents and Separatist Organisations

India's involvement in Pakistan's internal affairs is not a recent phenomenon but rather traces its roots back to the 1971 conflict when India supported, funded, and trained the Mukti Bahini, which contributed to the separation of East Pakistan. Although condemned by then-President Pervez Musharraf, who decried Indian interference, it was revealed that India was actively supporting and financing the Baloch insurgency. Former Balochistan Chief Minister Jan Muhammad Yousaf stated in 2004 that India's intelligence agency, the Research and Analysis Wing (RAW), was providing training to terrorists in Balochistan. Pakistan's intelligence agencies have

alleged that Indian consulates along the Balochistan border in Kandahar are supplying funds and weapons to the Balochistan Liberation Army and the Balochistan Liberation Front (Group, 2006). India's decision to grant citizenship to self-exiled Baloch separatist leader Brahmdagh Bugti raises questions about its significant interest in supporting separatist elements. India's involvement in funding, training, assisting, and financing terrorist activities in Balochistan has been portrayed as support for freedom fighters (Shah, 2017). Baloch Liberation Army leader Brahmdagh Bugti openly acknowledged India's support and funds and called upon India to provide moral, financial, military, and diplomatic support to the Baloch nationalist agenda. His words reflect a desire for India to champion Balochistan's cause on the global stage, similar to Pakistan's efforts concerning the Kashmir issue (Javaid & Jahangir, 2015).

Moreover, India's interest in Balochistan can be attributed to the province's abundant natural and mineral resources, along with its strategic significance. India has been accused of supporting insurgencies in Balochistan and exploiting differences and hostilities between the state and Baloch tribal leaders. India's aim appears to be to deprive Pakistan of access to these valuable resources, thus weakening its economy. Economic factors play a pivotal role in hybrid conflicts, as weakening an adversary's economy and isolating the state are key objectives. However, such political and economic instability could inflict significant damage on Pakistan (Ismail, 2014).

Propaganda Through the Formation of Hind-Baloch Forum

India has also resorted to propaganda tactics to bolster Baloch separatists, creating the Hind-Baloch forum in 2017 with the goal of spreading anti-Pakistan propaganda. The forum aims to support and promote anti-Pakistani elements, portraying the Baloch people as oppressed by the government on the international stage. The inaugural seminar titled "how India can play a role in the freedom struggle of Balochistan" indicates India's strategic use of propaganda tools to destabilise Balochistan further (Ahmed, 2018).

Ethnic and Sectarian Violence

Hybrid warfare encompasses colour revolutions, with the objective of overthrowing a state's leadership and seizing power. Under the Modi-Doval doctrine, vulnerable Baloch youth are being radicalised through propaganda. Ethno-fascist terrorists from groups like the Baloch Liberation Army and Baloch Liberation Front have targeted Sindhis, Punjabis, and Pashtuns, exacerbating ethnic tensions. India is accused of arming and financing ethnic conflicts to fuel unrest and instability in Balochistan, which directly affects Pakistan's overall stability (Ali, 2022). Additionally, sectarian violence and attacks on the Shia Hazara community in Quetta have fueled controversy. According to Senior Intelligence Officer Ali Haider Durrani, these sectarian acts of terrorism aim to disrupt Pakistan's peace through Balochistan (Kakar, 2017).

Propaganda Tactics

India has employed digital tools to extend its influence among the Baloch people, launching a mobile app and a website through All India Radio to reach a broader audience. Radio programs in the Baloch language, broadcast since 1974, have become more interactive (Agencies, 2018). India's information warfare also targeted the flow of information by briefly halting newspaper deliveries across Balochistan, allegedly under the auspices of RAW, causing concern among local print media owners. Numerous anti-Pakistan campaigns proliferate through social media platforms,

disseminating false information about Balochistan, fostering anti-state sentiments, and supporting ethnic and sectarian conflicts. These campaigns include anonymous profiles and individuals from both Balochistan and other parts of the country, operating under the banner of the Free Balochistan Movement (Ahmad, 2022).

Recently, the emergence of an anti-Reko Diq campaign can be attributed to the tactics of Fifth-generation Warfare. This campaign involved various elements, including the utilisation of Indian electronic and digital media in collaboration with militant groups. The fundamental purpose of their campaign was to portray the development project as an act of resource exploitation. Shortly after the signing of an agreement between a Pakistani company and a Canadian corporation, there was a large increase in Twitter activity, primarily from India. These tweets were intended for the Canadian corporation, pleading with them to leave Balochistan immediately. A press announcement from Baloch Raji Aajoi Sangar, an umbrella organisation representing numerous Baloch sub-ethnic nationalist organisations, accompanied this coordinated effort. This story was bolstered by Indian news outlets and social media pages, which complemented Twitter's continuous anti-Pakistan operations.

These covert operations were revealed in an EU DisinfoLab investigation, which identified a disinformation campaign aimed at damaging Pakistan's international image and stirring internal unrest. This policy aimed to deteriorate civil-military relations and build distrust between the state and its citizenry. According to the EU DisinfoLab 2020 research, 750 Indian-backed websites have been actively propagating anti-Pakistan propaganda for more than 15 years. These websites were active in over 115 countries around the world, with the primary goal of spreading anti-Pakistan sentiment (Kuchay, 2020).

Furthermore, the investigation uncovered a pattern of making and circulating fake news via ANI, which has operations in Brussels, Geneva, and around the world. This strategy effectively obscures local media networks in a staggering 97 countries, undermining nations in conflict with India. This proliferation of online content is a growing concern. Similar activities can be observed in a few other channels and digital newspapers, such as The Balochistan Post, which operates from Germany and are actively involved in amplifying anti-state propaganda of banned organisations. They manipulate facts to a certain extent, fabricating issues under the guise of addressing relative deprivation.

A notable instance of this disinformation campaign occurred during the Panjgur and Noshki attacks. Various Twitter accounts operated from India, under Baloch identities, played a significant role in spreading and magnifying fake news about these incidents. In addition to social media, prominent Indian newspapers like Hindustan Times published editorials and articles that glorified insurgents and their attacks. Following a suicide attack carried out by a female member of the Majeed Brigade, a banned terrorist organization associated with the Balochistan Liberation Army (BLA), foreign-funded newspapers and digital media outlets produced literature that glorified her actions. Hashtags like 'Shari the legend' started trending on Twitter, garnering thousands of tweets from across the border. Recent incidents, such as the arrest of two alleged female suicide bombers named Noor Jahan and Habiba, further underscore this issue. According to the Balochistan government spokesperson, both women were recruits of the BLA and were tasked with targeting a vehicle carrying Chinese citizens in another suicide attack. The recruitment of Baloch women into such organizations is a result of external forces exploiting the sentiments of Baloch youth through anti-state narratives facilitated by literature, false reporting, and digital

media. This manipulation acts as a catalyst for the erosion of national cohesion and integration (Rakhshani, 2022).

Kulbhushan Yadav Episode

India's involvement in Balochistan's unrest remained disputed until the arrest of Indian spy and RAW agent Kulbhushan Yadav in 2016 in Balochistan provided concrete evidence of India's subversive activities. Yadav confessed to being sent by RAW to finance and fund separatists and militants in Balochistan, incite sectarian violence, and execute acts of espionage and terrorism to sabotage national security. His admission shed light on India's hybrid warfare efforts in Balochistan (Shah & Ehsan, 2022).

Menace of Pashtoon Tahaffuz Movement (PTM)

External powers, including India, supporting Baloch sub-nationalists have also lent their support to the Pashtoon Tahffuz Movement (PTM) as part of a collective agenda against Pakistan. The PTM, perceived to be backed and funded by RAW and Afghanistan's National Directorate of Security (NDS), aims to exacerbate ethnic Pashtun conflict as a means to divide Pakistan and foment unrest. The movement gained prominence after the 2018 murder of Naqeebullah Mehsud and was accused of having links to terrorist organizations like Lashkar-e-Jhangvi and the Islamic State of Iraq and Syria. Operating primarily through social media, the PTM has spread its influence across Khyber Pakhtunkhwa and Balochistan. Some locals in Balochistan and Khyber Pakhtunkhwa view the PTM and its leader, Manzoor Pashteen, as agents of external forces seeking to tarnish Pakistan's image (Sevea, 2018).

Role of NGO's

Geopolitical commentator Andrew Korybko (2017) has cautioned Pakistan to be wary of developments in Balochistan and Gilgit-Baltistan, given the escalating hybrid warfare scenario. A shift toward exclusive nationalism, driven by external NGOs and informal actors, could imperil the patriotism of residents in both areas. Korybko stressed that foreign entities are actively pushing the populations of Balochistan and Gilgit-Baltistan against the state. Given the developing hybrid danger, Pakistan must take proactive measures to avoid additional internal unrest (Arshad, 2017).

POLICY OPTIONS TO COUNTER THE CHALLENGES

The current scenario in Balochistan is extremely alarming for Pakistan's sovereignty. This province has historically been a focus point for external parties wanting to exercise influence due to its vast energy and mineral resources. However, the growing frustrations and weaknesses within Balochistan have made the scenario ripe for exploitation against Pakistan. This has resulted in a hybrid warfare environment and a plethora of various threats to Pakistan's stability (Achakzai, 2021). Internal insecurity, restricted prospects for the indigenous population, and the growth of sectarian violence are all elements that have contributed to the strife in Balochistan. These, among various causes, have contributed to the province's complicated web of issues. It is worth emphasising that, in the face of these obstacles, development projects in Balochistan have been started with the goal of providing critical services and opportunities to its people. The struggle in Balochistan, however, is not a one-sided affair. It is worsened further by the entrenched views of local Sardars and Nawabs, who frequently display rigidity and a sense of entitlement.

These established power structures, which are difficult to change, have exacerbated the dispute and hampered efforts to resolve it. As a result, comprehending the numerous factors at work in Balochistan is critical to addressing the challenges and ensuring Pakistan's sovereignty.

A comprehensive approach is required to handle every challenge posed by hybrid warfare and promote stability in Balochistan. It is critical to develop a strong education policy focused on raising the province's literacy rate. Balochistan's youth are vulnerable to external propaganda operations, necessitating close monitoring of propaganda institutions and organisations. Furthermore, organising programmes and seminars to educate the youth about hybrid warfare dangers helps strengthen their resistance to external influence. Second, the China-Pakistan Economic Corridor (CPEC) provides the potential to create jobs, notably for the Baloch population. This not only promotes economic progress but also increases a sense of ownership and engagement in the Balochistan development. Third, addressing the current Sardari and Nawab system in Balochistan is critical. This established system fosters brutality and marginalisation, particularly among women who are subjected to it. Efforts to deconstruct these systems can result in the emancipation and empowerment of marginalised people. Fourth, a peaceful resolution to the missing persons issue is essential because it not only alleviates the suffering of afflicted families but also creates a sense of justice and reconciliation. Furthermore, the provision of essential services such as healthcare, education, and employment opportunities is fundamental in improving the overall socio-economic landscape of Balochistan. Lastly, a re-evaluation of the role and involvement of the Pakistan Army in Balochistan is necessary to address the disparities and promote inclusivity among the Baloch populace. A balanced approach that combines security with socio-economic development can contribute significantly to stability and progress.

CONCLUSION

Pakistan has consistently experienced Indian engagement in various insurgent activities, an issue that has been widely recognised. Despite Pakistan's international appeals against Indian aggression within its borders, it remains evident that a significant portion of militant and terrorist activities within the country are instigated by Indian agencies. This persistent Indian threat has caused significant hurdles to Pakistan's development and its overall prosperity. Furthermore, India's strategy to engage with Pakistan has evolved by refraining from outright military interventions. Instead, India has pursued a diversified strategy that contributes to its unconventional warfare. This hybrid warfare strategy not only destroys Pakistan's internal peace but also provides the framework for India to undermine Pakistan's state stability. However, it is critical to recognise that these hybrid warfare strategies offer significant problems to Pakistan's security services and government institutions. The dynamic and destructive character of hybrid warfare makes it difficult to grasp and effectively counter. The use of guerilla tactics by India has posed a particularly serious challenge to Pakistan's security infrastructure.

However, India's participation in Balochistan demonstrates its use of hybrid threats. India's historical use of espionage systems, tracing back to the era of Kautilya, underscores its longstanding interest in gathering intelligence about neighbouring countries and adversaries. In the case of India's hybrid warfare strategy in Balochistan, the internal complexities, vulnerabilities, and political and economic alienation experienced by the Balochistan populace have created fertile ground for external interference in the province. Pakistan's government has raised international concerns regarding Indian interference in Balochistan, with Prime Minister Narendra Modi's Independence Day speech in 2016 and the statements of National Security Advisor Ajit Doval providing clear indications of India's strategic intent to exploit these vulnerabilities.

India's apprehension primarily centres on Pakistan's potential to surpass India's influence, particularly in conjunction with China, through the CPEC. This is of paramount concern to India, given its aspirations for regional hegemony within South Asia. Consequently, the Modi government has adopted a multi-pronged approach aimed at countering Pakistan on multiple fronts, including undermining its growing position in South Asia, facilitated by the CPEC and various regional projects conducted in collaboration with China since its initiation in 2015. Moreover, through its involvement in Balochistan, India seeks to limit China's reach into the Central Asian Republics and Afghanistan, leveraging the strategic location of Gwadar and its proximity to the Chabahar Port. India's investments in the development of the Chabahar port, in partnership with Iran, further exemplify its efforts to curb China's influence. Recognising India's interference and involvement in Balochistan is crucial for Pakistan in the context of hybrid warfare threats. India's strategies encompass supporting ethnic groups, providing funds and weaponry to insurgents, and facilitating non-state terror organisations with the objective of destabilising Pakistan's internal security—a formidable challenge to Pakistan's national security. Thus, comprehending the dynamics of hybrid warfare and effectively countering these threats assumes paramount importance for Pakistan's security and stability in the region.

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THE CHALLENGES OF TURKIYE'S TO BE THE MEMBER OF THE EUROPEAN UNION

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ABSTRACT

Turkiye and the European Union (EU) diplomatic relationship started in 1959 when Türkiye filed for associate membership in the European Economic Community (EEC). Subsequently, Türkiye applied for EU membership in 1987. However, Türkiye was only admitted to the EU Customs Union in 1996, not as a member of the EU. Nevertheless, Türkiye's aspirations to become an EU member persisted until the EU launched negotiation talks in 2005 under the EU's Acquis Communautaire legal framework. However, it was an extremely long and slow procedure until the EU suspended the negotiation process in 2016. This paper will examine the criteria for joining the European Union and identify why Türkiye's negotiation process stagnated in 2016. Aside from that, this article will also analyze the polemics and political Islamophobia concerns that significantly impact Türkiye's entry into the European Union.

Keywords: *Islamophobia, Türkiye, European Union (EU)*

INTRODUCTION

The Republic of Türkiye is situated between the Middle East and Europe. It has operated both as a barrier and a bridge connecting the two regions throughout its history. Türkiye is one of the region's largest countries in size and population, with a geographical area bigger than any European country. Türkiye's capital city is Ankara. Turkish is the official language, and Islam is the state religion. Turks are the majority ethnic group in Türkiye, accounting for 75% of the total population, followed by Kurds (20%) and other ethnic minorities (5%). Türkiye's government is a constitutional republic headed by a unitary presidential president, and its current President is Recep Tayyip Erdogan.

Türkiye was known around the world for its Ottoman Empire history. The Ottoman Empire was one of the world's most powerful and long-lived Islamic empires. It governed significant parts of the Middle East, Eastern Europe, and North Africa for almost 600 years, and Western Europeans often saw them as a threat as a consequence. In 1299, caliph Uthman bin Affan founded the Ottoman Empire. However, the Ottoman Empire collapsed in 1918, during the start of World War I, and the Sultan's title was removed. Türkiye became a republic on 29 October 1923 under the leadership of President Mustafa Kamal Atatürk. Türkiye has become a secular Islamic state under the Atatürk leadership, differentiating it from the other Islamic countries of the Middle East.

BACKGROUND OF TURKIYE – EU RELATIONSHIP

Relations between Türkiye and the EU date back to the late 1950s when Türkiye applied to join the European Economic Community (EEC) as an associate member. The Ankara Agreement of 1963 had secured Türkiye membership in the EEC. The accession of Türkiye to this economic union is a significant step forward for the country's integration with the European bloc.

To further improve its economic cooperation with the EU, Türkiye joined the EU Customs Union in 1996, eliminating trade restrictions, including tariffs and non-tariff barriers (Alessandri et al., 2018). With the exception of Iceland and Norway, this deal brought Türkiye and the EU closer together economically than any other non-member country had before and opened up the 65 million-consumer Turkish market to EU businesses. A custom union with Europe was a symbol for the Turks of their membership in Europe, and hence a step towards the EU integration.

However, during the European Enlargement Programme in 1997 (The Luxembourg Summit), EU excluded Türkiye as a candidate country. The Turks were outraged by this decision because weaker democracies and economies such as Slovakia, Bulgaria, and Romania were selected. The decision of EU to incorporate the Greek side of Cyprus, in flagrant contravention of international treaties governing the foundation of the Cyprus Republic, was the ultimate humiliation perpetrated on the Turks.

After more than 55 years of ups and downs in relationship between Türkiye and Europe, the EU's decision to launch formal accession negotiations with Türkiye in 2005 marked a significant milestone in the relationship. However, due to human rights and the rule of law concerns, the Türkiye - EU negotiation process was put on hold in 2016 and has remained stalled to this day. With the deteriorating ties between the EU and Türkiye, it became obvious that something needed to be done to improve the situation. Apart from the fact that Türkiye was drifting away from the EU, a number of significant foreign policy and security issues on the alliance's agenda were also stagnating.

TURKIYE'S INSUFFICIENT CRITERIA

The stance of EU MPs and European politicians in the discourse debating Türkiye's membership into the EU can be divided into two factors. The first factor is to take a stand based on the framework of the agreement that has been agreed between Türkiye and the EU, namely Türkiye's ability to meet all the terms and conditions of the *Acquis Communautaire*. While the second factor refers to groups that tend to play on racist sentiments, xenophobia and Islamophobia. The arguments put forward are more about finding differences as well as hostility. This sort of animosity and sentiment is often played out by populist and far-right political party organizations that are very influential in stirring protests against Türkiye's EU membership.

THE COPENHAGEN CRITERIA

Let us begin by looking at the first factor in the argument for Türkiye's accession into EU, which is the Copenhagen criteria. The Copenhagen criteria, often known as the accession criteria, are the basic requirements that all applicant nations must meet in order to become a member. It is a roadmap for defining accession eligibility, as well as a checklist of political and economic standards for candidate member nations (Dudley, 2020). There are three primary requirements that must be fulfilled by the candidate countries, which are as follows: (1) Political Criteria: The candidate nation must have a stable democracy, the rule of law, human rights, and minorities must be respected and protected, (2) Economic Criteria: A functioning market economy and the ability to deal with competition and market forces in the EU, (3) Administrative and organizational competence to successfully execute the *acquis*, as well as the willingness to accept membership duties.

After fulfilling all three requirements, the candidate nation must get the endorsement of the EU Council, the Commission, and the European Parliament. According to their constitutional

criteria, its membership to the EU must also be signed and ratified by all current EU nations. This means that new members must not only fulfill the requirements set but also obtain the approval of all current EU members.

During the more than 10 years of discussions between Turkiye and the EU since 2005, Turkiye has only opened 16 out of 35 chapters and closed only one chapter, which is Science and Research under the EU legislative framework known as *Acquis Communautaire* (Saparudin & Kamarudin, 2019). It is an extremely slow procedure when compared to other EU member countries, such as Croatia, which took 8 years, Spain 7 years, and Poland, which took 5 years. Even more frustrating for Turkiye, the country's never-ending internal issues hampered its EU membership process by failing to fulfill European norms, principles, and admission conditions outlined in the *Acquis Communautaire*. Moreover, Turkiye's stance in the reform plan, notably in the areas of judicial and legal reform, human rights and freedoms, as well as foreign and security policy, has caused the European Union's leaders' trust in the country has diminish.

DEMOCRACY, RULE OF LAW AND HUMAN RIGHT ISSUES

On July 15, 2016, the Turkish Armed Forces, dubbed as Peace Home Council, attempted a coup against President Erdogan's administration. The violent coup attempt in July 2016 was a watershed moment in Turkiye's political history. Soldiers and tanks came to the streets, and explosions could be heard in Ankara and Istanbul. The coup, however, failed because it was effectively halted by the Turkish people, as well as the military and police that are loyal to the government. Nonetheless, the overall cost of victory was high as 241 people were killed and 2,194 were wounded. This military coup was linked to Fethullah Gülen's movement. Mr Gülen's objective was to shift Turkiye away from secularism and more towards Islamic religion and morals rather than politics (BBC News, 2016).



Figure 1: The failed military coup that was halted by the Turkish citizen

Tens of thousands of people have been arrested in Turkiye on suspicion of strong links to the Gülen movement. For alleged connections to the movement, thousands of military personnel, pilots, police officers, government workers, professors, and even teachers were fired. Dozens of media sites accused of having ties to the Gülen movement have also been closed down (BBC News, 2016). In another measure, universities' ability to elect their own rectors was eliminated. Erdogan will now appoint candidates personally.



Figure 2: Thousands have been detained on suspicion of having close ties to the Gülen movement

As a result of the attempted military coup, a constitutional referendum on replacing Türkiye's parliamentary system with a stronger president was conducted on April 16, 2017. The ruling Justice and Development Party (AKP) and the Nationalist Movement Party (MHP) suggested 18 reforms. The yes vote campaign won 51.3 percent of the vote, while the no vote won 48.7 percent, allowing President Recep Tayyip Erdogan to assume complete control of the government (The Guardian, 2017).

The Prime Minister's office was eliminated as a consequence of its acceptance, and the current parliamentary form of government was replaced with an executive presidency and a presidential system. The president has the authority to make decrees, proclaim states of emergency, and appoint ministries and other governmental officials. It is also possible that Erdogan will continue in power in the NATO member state until 2029. (Tattersall & Solaker, 2017).

Many have viewed the results of the people's referendum on April 16 as bolstering President Erdogan's 'grip on power' in Turkish politics and as the beginning of a one-man rule or autocratic leadership (Saparudin & Kamarudin, 2019). This scenario had strained Türkiye's ties with the European Union, which accused Erdogan of using the coup attempt to crush the opposition. This lawsuit has also caused the Türkiye-EU accession negotiations to stagnate till today. Türkiye's ties with the United States also worsened, as Washington refused to extradite Gulen. The Turkish government's actions have negatively affected Erdogan's legitimacy and commitment to uphold the rule of law, media freedom, and human rights.

THE ISLAMOPHOBIA ISSUES

In this chapter, we will examine the second important challenge facing Türkiye's - EU accession, which is Islamophobia problems. According to the Oxford dictionary, Islamophobia can be defined as the nature of fear, hatred and prejudice against Islam and Muslims. This phenomenon is also defined by Ali et al. (2011) as follows:

"Exaggerated fear, hatred, and hostility toward Islam and Muslims that is perpetuated by negative stereotypes resulting in bias, discrimination and the marginalization and exclusion of Muslims from social, political and civic life."

Many EU and European politicians are Islamophobic and use hate, racism, and xenophobia to their advantage. The arguments presented are primarily concerned with finding

areas of disagreement as well as hatred. This approach is prominent in many European nations, particularly in the context of the debate over Turkiye's membership in the EU. Populist and far-right political party groups are considered as having a large influence in mobilizing resistance to Turkiye's accession to the EU. The Europe of Freedom and Direct Democracy Group, the Progressive Alliance of Socialists and Democrats in the European Parliament, and the Alliance of Liberals and Democrats for Europe are among the political groupings that have been vocal in their opposition to Turkiye's membership. Geert Wilders, a Dutch member of parliament (MP) known for his anti-Muslim stance, has been outspoken in his opposition to Muslim migration to the Netherlands and Europe. He states:

“Islamic countries like Turkiye are not part of Europe. European values such as freedom, democracy and human rights are not in line with Islamic teachings. Europeans do not welcome you (Turks)” (PVVpers, 2015).

According to James Carver, a European MP from the UK Independent Party (UKIP), Turkiye exploited the refugee issue as a stepping stone to enter the EU (UKIP MEPs, 2016). Guenther Oettinger, the EU Commissioner for Budget and Human Resources, claimed that Turkiye would not be able to join the EU in this decade or the next decade (RT, 2015). Bill Etheridge, a UKIP European MP, argued that Turkiye posed a serious threat to the EU (UKIP MEPs, 2015). Norbert Hofer, Austria's 2016 presidential candidate from the Freedom Party of Austria, threatened that if the EU accepted Turkiye as a member, Austria would leave the bloc. Hofer also demanded that the negotiations on Turkiye's – EU membership be halted (Sputnik, 2016).

Former German chancellor Angela Merkel actively voiced her disapproval of Turkiye's accession discourse long before she took power in 2005, advocating Turkiye for a 'privilege partnership' rather than EU membership (Reuters, 2015). When Merkel paid a working visit to President Ahmet Necdet Sezer in September 2011, Merkel stated that “We don't want the full membership of Turkiye, but we don't want to lose Turkiye as an important country”(Deutsche Welle, 2006).



Figure 3: Former German Chancellor, Angela Merkel (left) and Geert Wilders

Former French Prime Minister Nicholas Sarkozy, as well as Nigel Farage (a British MP and former EU MP) and other UKIP leaders, opposed to Turkiye's inclusion due to the geographical reason of Turkiye having only seven or nine percent of its territory in continental Europe (Truthvspropaganda, 2008). Austrian Councillor Christian Kern and Austrian Defense Minister Hans-Peter Doskozil both said that the Turkish membership negotiations were merely a “diplomatic fiction” (Saparudin & Kamarudin, 2019). Marine Le Pen, the far-right leader of France's National Front, stated Turkiye threatened the EU by exploiting the refugee situation to ease the EU's membership process, as well as Turkiye's inability to protect human rights and

justice, particularly after the coup attempt (Yildiz, 2018). Danial Hannan, a British politician, emphasized the complaint against Türkiye for practising iron nails, anti-western fanaticism, and religious bigotry. Such a country is not an ally to the EU (Dan Hannan, 2009). According to Akşit et al. (2010), some European politicians believe that Türkiye's admission would clash civilizations between Islam and the West.



Figure 4: Norbert Hofer (left) and Christian Kern (middle) and Hans-Peter Doskozil

These anti-Turkish and Islamophobic protest voices are dominant in the EU parliament and among Europeans. The growth of far-right groups, which have fuelled racism and anti-Islamic sentiments, has influenced the Turkish-EU membership debate. The Brexit phenomenon perfectly illustrates translating the far-right group's influence, which drove the United Kingdom to exit the EU bloc. Far-right organizations frequently spread misinformation claiming that Turkish membership would dominate the EU and intensify Islamization in Europe. This sentiment has intimidated the European people in the EU bloc (Saparudin & Kamarudin, 2019).

Islamophobia is a severe problem in Europe, posing a serious challenge to social integration, democratization, and global peace. Examining the narrative of Islamophobia, the common knowledge of this issue became recognized following the 9/11 attack when the peak of anger and prejudice towards Muslims could no longer be contained. Without valid evidence or proof, the world blames Islam for being the root of all bloodshed, terrorism, and radicalization. The Charlie Hebdo case (Petrikowski, 2022) and the killings in Nice, France (History, 2016) (BBC News, 2020) have reignited the discussion in Europe about Islam and Muslims. In addition, threats and explosions organized by the extreme group, ISIS in Brussels, France, and Germany (Cruickshank, 2017), have fuelled Islamophobia among Europeans. To make matters worse, the Syrian refugee crisis in Europe has become the focus of a rhetorical discussion about Muslims "dominating" Europe.

Türkiye's accession to the EU is now viewed as an increasingly difficult and complex process. This is based on a survey done by the Economic Development Foundation, a Turkish think tank, to determine the main challenges to Türkiye's EU membership. According to the IKV survey, 61% of the problems were due to 'cultural and religious differences,' 41% were due to objections from EU member states, and 21% were attributed to Europeans' prejudices and perceptions of Türkiye (Ceran et al., 2016). He emphasized that issues affecting the image of Islam and the Muslim-majority population had a significant impact on Türkiye's journey to joining the union. While the Eurobarometer, a perception study of European countries about Türkiye's membership proposal, discovered such a high rejection by the European community. Even though the general public is not directly involved in the formulation of EU policies, EU decisions are made within what the European civil community recognizes.

Most recently, Brexit was seen as a strong call by the majority of British who are increasingly rejecting the influx of foreigners and pro-integration and pro-multicultural groups of democratic political leaders due to a game of racist sentiment and Islamophobia blown up by far-

right groups. In the United States, Donald Trump's victory heightened the white supremacy issues anti-Muslim and anti-immigrant prejudice as a result of his political clout, and he is seen to have influenced the majority of Americans. In the Netherlands, several Turkish election candidates have received death threats in reaction to the anti-Muslim and anti-immigrant sentiment that dominated European elections in 2019 (Gurbuz, 2019).

CONCLUSION

The journey of Türkiye - EU diplomacy is increasingly complicated due to various factors and incidents, particularly in the negative perception of Islam by the majority of European society and political leaders. The decision of the EU Parliament to freeze the Turkish membership negotiations on 22 November 2016 is seen to have slowed down the membership process and will certainly take a long time for Türkiye in its mission to join the bloc. The weight to this barrier is not simply because of Türkiye's failure to meet the pre-requisites of the Copenhagen Criteria alone, but is also linked to the public perception of Türkiye as an 'Islamic power' that has the potential to influence the political landscape in Europe. This perception is deeply troubling the EU, which wants to maintain its European values and norms it has been inherited for so long. Although it appears that Türkiye will not join the EU in the near future, internal political stability must be secured first in order to ensure a good rule of law, peace and democracy for its nation. The Turkish government should also offer the finest example of a fair and transparent Islamic administration; only then can the issue of Islamophobia progressively disappear, and the negotiation dialog may commence in the future.

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ARTIFICIAL INTELLIGENCE IN THE TWENTY-FIRST CENTURY: REPERCUSSIONS AND ADAPTION IN THE MALAYSIAN ARMED FORCES

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ABSTRACT

The Fourth Industrial Revolution and the artificial intelligence underpinning it are bringing about fundamental shifts in how we live, work, and interact with one another as citizens. Some reports recommend that national governments and the MAF adopt their very own AI strategy to safeguard and care for their inhabitants during the period of technological transition. There is a need to create all-encompassing training and educational opportunities to cultivate an appropriate level of trust in AI-powered systems. Also, it is necessary to develop an export policy for artificial intelligence systems that encourages interoperability with allies while protecting crucial technologies. Last but not least, there is a dire need to address the ethical challenges that are associated with this emerging technology.

Keywords: *Applications, Chatter Bots, Simulation, Robotics, Cybersecurity*

INTRODUCTION

Artificial intelligence is a technology that can be used in a variety of fields, including electricity, computers and internal combustion engines. AI will improve productivity in a wide range of industries. These applications have the potential to cause economic growth and disruption on a scale comparable to that of an earlier industrial revolution. AI is a branch of computer science that deals with the development of programs that can think for themselves. AI seeks to improve the computer's performance in solving complex problems. AI is increasingly being used in web applications, which has led to significant advances in the field. Today, AI is used in a wide range of applications, including in the military. At all levels of command and military operations, AI is used to support decision-making, e.g., in assessing the readiness, reliability and capabilities of armed forces, as well as in complex mission planning and integrating data from different sources. AI research also addresses the difficulties associated with supporting such decision-making in rapidly changing situations. The use of this technology by the military opens up a whole new world of possibilities.

AI's exaggeration frequently distorts our understanding of the benefits it presents and the obstacles it poses in applying it from scale to the battlefield. AI is the ability of a computer system to perform activities that require human intelligence. It is a technological enabler, not a revolutionary weapon system that works with alone, which will eventually result in a "sky-net" catastrophe (Luis & Moncayo, n.d.). Technology is a fantastic enabler in war, allowing for a paradigm shift in how we think about fighting it, according to Korteling et al., (2021). AI has now surpassed human intelligence in limited task selection. Artificial General Intelligence and Artificial Superintelligence, in which a machine's cognitive ability exceeds that of a human in any given task, require additional research (Luis & Moncayo, n.d.). However, the military is close to realizing the diversity of benefits that AI may offer.

Beginnings and Recent History

During World War II Alan Turing cracked the encryption of the German Enigma machine, and in 1940 the use of AI in the military began. Deciphering the “Enigma” code was the main focus of Turing’s work at Bletchley Park during World War II. The Enigma was a type of encryption machine used by the German military to send messages in a secure manner. Turing and codebreaker Gordon Welchman developed the Bombe, a machine that helped codebreakers significantly reduce their workload (Imperial War Museum, 2018). In 1950, Turing claimed that computer programs can be taught to think like humans, and he developed the “Turing Test” to determine whether or not a computer is intelligent. This test was developed to determine whether a machine can think or not. A human interviewer interacts with both humans and machines during the test to determine who is a human and who is a machine (Pannu & Student, 2008). In 1956, Dr John McCarthy proposed a two-month investigation into artificial intelligence. His preferred term was ‘computational rationality’, but he decided against it because it would have prevented him from working on ‘analogue cybernetic devices’ (Stuart Russell & Norrig, 1996). Dr McCarthy had no idea what he was unleashing on the world when he coined the term AI. The term ‘artificial intelligence’ has an eerie ring to it and evokes pseudo-scientific speculation in popular culture. In 1958, the United States Department of Defence established the Advanced Research Projects Agency (ARPA) to promote research and development of military and industrial strategies. In 1960, ARPA began training computers to simulate human thought in order to fulfil its mission

APPLICATIONS OF ARTIFICIAL INTELLIGENCE

AI applications are the result of the fusion of cutting-edge research in the fields of computer science and robotics. The goal is to develop intelligent machines that are able to perform difficult tasks on their own. AI can be used in any field that requires intelligent analysis, precision and automation. Heavy industry and aerospace, finance, computing, aviation, swarm intelligence, toys and games, weather forecasting, transportation, medicine and telecommunications are just some of the areas where AI has found application. Intelligent capabilities such as pattern recognition, artificial creativity, natural language processing, computer vision, diagnostics, robotics, game theory, non-linear control, chatterbots, virtual reality and image processing, to name a few, enable these AI applications (Anyanwu, 2011). Among the AI applications that have been carried out using AI techniques are:

Language Comprehension. One of the many applications of AI in the military is language comprehension. This includes reading and responding to natural language as well as translating between spoken and written language and between natural languages. The process involves a number of sub-processes, including speech recognition, semantic information processing (also known as computational linguistics), question answering, information retrieval and language translation

Adaptive and Learning Systems. AI in the military is used for adaptive and learning systems such as cybernetics and concept formation. Cybernetics and concept formation are two sides of the same coin. Cybernetics refers to the ability to modify behaviour based on past experience, while concept formation refers to the ability to construct general rules about the world based on such experience.

Solving Problems. AI can also be used to solve problems. They are able to accurately represent a problem, develop a strategy to solve it and determine when additional knowledge

is needed and where it can be obtained. Problems have been solved using a variety of methods, including inference (Resolution-Based Theorem Proving, Plausible Inference and Inductive Inference), interactive problem solving, automatic program writing and heuristic search.

Observation. Next, AI lends itself to observation. The ability to compare a perceived situation with an internal model that represents the perceiving organism's "knowledge of the world" in order to interpret it. Pattern recognition and scene analysis are two types of analysis that produce a structured set of relationships between entities in a scene. AI is installed on airline aircraft to monitor atmospheric conditions and system status. The autopilot can be activated once a target course has been set. In weather forecasting, neural networks are used to predict weather conditions. A neural network is fed historical data, which it then uses to understand and predict weather patterns.

Modelling. Another AI application is modelling. The ability to construct an internal representation and a set of transformation rules that can be used to predict the actions and relationships of a group of objects or entities that exist in the real world. The representation problem for problem-solving systems, modelling natural systems (economic, sociological, ecological, biological, etc.) and modelling the Hobot world are all examples of modelling processes (perceptual and functional representations). The representation problem for problem-solving systems was originally formulated as a challenge for problem-solving systems).

Robots. AI application is also very prominent in robotic applications. A robot is able to traverse different types of terrain and manipulate different types of objects, in addition to the features mentioned above. These include exploration, transport and navigation, industrial automation (e.g., process control, assembly tasks and executive tasks), protection, other activities (e.g., agriculture, fishing, mining, sanitation, construction, etc.), the military and domestic work.

Games. AI application is used widely for game applications. Adopting a formal set of game rules and translating them into a representation or structure that allows the use of problem-solving and learning skills to achieve a level of performance that is considered satisfactory. Some of the first attempts to mass produce locally oriented AI for education or entertainment were made in the 1990s. Tamagotchis and Giga Pets, the internet and Furby, the first robot made available to the public, were examples of how the digital revolution eased people into a life where they have to interact with a variety of forms of AI.

Heavy Industry and Space Exploration. The combination of robotics and cybernetics with AI expert systems has taken robotics and cybernetics to new heights. In the manufacture of automobiles, machine tools, computer chips and almost all other high-tech processes, an entire manufacturing process is now fully automated, controlled and maintained by a computer system. This is also the case with almost all other high-tech processes. They are entrusted with dangerous tasks, such as handling radioactive material. Robot pilots are responsible for carrying out complicated maneuvers for unmanned space vehicles. As a result of the rapid technological advancements in the fields of disruptive innovation and Deep Learning, significant advances in AI and Machine Learning are anticipated to make it possible for superpowers to realize their ambitions and dominate their respective autonomous technology fields in the coming decades. Vladimir Putin has been quoted as saying, "Whoever becomes a leader in AI will be a ruler of the globe" (Vincent, 2017). The United States 'Third Offset Strategy' aspires to enhance 'Inner Machine Learning Systems, human-machine fighting forces, and network-enabled semi-autonomous weapons. At the same time, China has declared its intention to lead the world in AI by the year 2030, transitioning from informative to smart warfare (Luis & Moncayo, n.d.). According to Johnson (2020). The

strategic impact of military AI is not unique or exclusive to this technology. The impact of AI on the military's strategy is not singular and exclusive. However, the convergence of conflicting multi-faceted technological assumptions with enhanced conventional capabilities results in both positive and negative effects of AI. By enhancing national retaliation capabilities, a new generation of conventional weapons boosted by AI can serve to stabilize international strategic connections. Strengthening both early warning and command and control will achieve the objective. Although AI is inherently multi-dimensional, this development has the potential to contribute to the stabilization of international strategic ties.

APPLICATIONS IN THE MILITARY

It is possible that AI will have an impact on land, sea, air, space and information, as well as on all levels of military conflict (political, strategic, operational and tactical (Svenmarck et al., 2018). Currently, the most common applications of AI in the military include autonomous weapons and weapon targeting systems, surveillance, cybersecurity, homeland security, logistics and autonomous vehicles (Ozdemir, 2019). In terms of national defence, AI has great potential. Artificial intelligence is likely to be used by the military in the same way as computers and electricity. AI is expected to impact military strategy, operations, logistics, personnel and training. Some military AI applications, such as lethal autonomous weapons systems and AI in nuclear operations, could have catastrophic consequences. During the first and second Industrial Revolutions, the scope and scale of destruction that could be wrought with Industrial Age weapons increased significantly. Mechanization enabled an increase in destructive power, leading to the deadly trench warfare that characterized the First World War. One example of the influence of mechanization is the machine gun. Radio communications made it possible to coordinate operations over long distances, which in turn enabled rapid advances such as the Blitzkrieg during the Great War II. The transition from the Bronze Age to the Atomic Age occurred during World War II when the bombings of Hiroshima and Nagasaki demonstrated the extremely destructive potential of nuclear weapons.

Policymakers recognized the gravity of nuclear weapons and the serious threat they posed - and continue to pose - to civilization. The impact of AI on warfare cannot be characterized by a single technology such as nuclear weapons, but by a multitude of changes brought about by the widespread use of general-purpose technologies. This contrasts with the impact that the Industrial Revolution had on the world at the time. As a result of industrialization, the physical scope and scale of combat operations increased, enabling armed forces to field larger and more destructive forces capable of moving further and faster, unleashing more firepower and operating in a wider range of areas. This allowed for an expansion of the physical reach and scope of combat. The field of artificial intelligence (AI) is currently undergoing a cognitive revolution, and the hard part is figuring out how this revolution will affect the field of warfare (Scharre, 2019). The main military applications where AI will make significant progress in the coming years are the following (Aihints.com, 2022):

Cybersecurity. Cyber-attacks on military systems can result in the loss of important military data as well as damage to the systems themselves. On the other hand, systems equipped with AI protect computers, data, programs and networks from unauthorized access. Web security systems supported by AI can also record patterns of cyber-attacks and develop counter-attack tools in response to these patterns.

Combat Systems. Defense forces in several countries are integrating AI into weapons and other warfare systems deployed on space, air, sea and land platforms. The use of artificial intelligence in these systems has led to more efficient warfare systems that rely less on human

input. It has also improved the performance and synergy of warfare systems and requires less maintenance. AI has the potential to equip autonomous weapons with the ability to conduct cooperative attacks

Transportation and Logistics. In the military, AI will soon play a crucial role in logistics and support. Ammunition, weapons, troops and supplies must be transported for a military operation to be successful. The use of AI in the transport sector has the potential to cut costs and reduce the amount of manual work performed by humans. It gives military fleets the ability to detect anomalies and predict component failures in real-time.

Target Recognition. AI strategies have the potential to improve the accuracy of target detection in highly complex combat environments. A comprehensive understanding of potential operational areas can be gained by a nation's armed forces through the study of intelligence, documents and reports, and other information. It is possible to improve the ability of target detection systems to locate their targets by integrating AI into these systems. AI-powered target recognition systems are capable of performing a variety of tasks, including analyzing mission approaches, predicting enemy behavior, compiling environmental conditions and developing mitigation strategies. Based on the information gathered, machine learning is used to pursue objectives. AI can be used in war zones to provide surgical support remotely. In critical conditions, AI-powered systems can effectively analyse a soldier's medical data and help with diagnosis. An excellent example of this is the partnership between the research team at IBM and the United States Veterans Administration to develop the Electronic Medical Record Analyzer, a clinical reasoning prototype (EMRA). Using machine learning strategies, this technology has been developed to process patients' medical records and identify and classify the various health problems they have.

Monitoring of Threats and Safety of Military Personnel. Intelligence, Surveillance and Reconnaissance (ISR) is an operation essential for conducting situational awareness and threat surveillance. Processing data in support of a variety of military operations is achieved through these operations. It is possible to send unmanned systems used for ISR missions on a predetermined path. When equipped with AI, these systems can assist military personnel in monitoring threats and improve situational awareness. Drones can be used in conjunction with AI to patrol border areas, detect threats and relay threat information to the appropriate response teams. Consequently, the use of AI in warfare improves the security of the military.

Managing Large Amounts of Data. AI helps in processing large amounts of data quickly to extract useful information. AI is helpful in gathering and summarizing data that comes from multiple sources, as well as aggregating important data from multiple data sets. This type of analysis enables military personnel to identify patterns and draw conclusions.

Combat Training and Simulation. The fields of computer science, systems engineering and software engineering are used in the creation of computer models for simulation and training purposes. These models are used to familiarize soldiers with the various combat systems used in military operations. Simulation and training applications are receiving more funding than ever before. The US Army is conducting warfare analysis and has launched sensor simulation programmers. SAIC Orbital ATK and Leidos are among the companies the US Navy has brought in to support its programmers.

ARTIFICIAL INTELLIGENCE IMPLEMENTATION IN THE MALAYSIAN ARMED FORCES

The MAF is making great strides towards making the armed forces the most technologically advanced in the world. The MAF will be transformed by the use of artificial intelligence-based technology. Years of preparation have led to the government's support and aspiration to modernise the military through AI. A culture of cutting-edge innovation and collaboration has been cultivated thanks to bold initiatives, earmarked budgets, policy changes and indigenous support. In the areas of data, logistics, surveillance, weapons and much more, this collaboration between the public and private sectors, research organisations, academic institutions, start-ups and entrepreneurs has helped develop many innovative AI-based tech products. The integration of autonomy into weapon systems, ISR (Intelligence, Surveillance, and Reconnaissance) and data management could be an important aid in preventing terrorism, implementing counter-terrorism measures and protecting troops. In reality, AI in defence has what it takes to fundamentally change conflict and warfare. The implementation of AI in the MAF, the benefits of AI in combat and, last but not least, the risks of AI are discussed in this chapter.

Benefits of Artificial Intelligence in Warfare

AI refers to a relatively young field of computer science that attempts to simulate human cognition. John McCarthy is considered to be the person who first used the term "artificial intelligence" in 1950. He stated that any aspect of learning or any other feature of intelligence can be so perfectly characterized theoretically that a computer can be designed to reproduce it. The goal is to figure out how to make computers talk, how to construct abstractions and concepts, how to solve problems currently reserved for humans, and how to make computers themselves better. The ability of a computer program to learn and think is what is meant by the term AI. Anything in which a computer programme performs a task that we would normally equate with human intelligence can be considered an example of AI. Humans, in their quest for sophistication, have constantly developed and perfected numerous technologies. This is to ensure that they can develop products that make it easier for them to perform numerous techniques. Since the dawn of time, humans have engaged in a number of tasks to ensure that they have a chance in the various situations in which they have appeared. There are a variety of uses for artificial intelligence in the field of military research and development. It has been discovered that there are many benefits associated with using artificial intelligence.

Speed of Decision-Making

The advantage of greater speed is most often mentioned when talking about the use of AI in combat. Deadlines are not necessarily determined by the decision-making processes that AI can speed up. There are certainly scenarios where one can imagine such an advantage, but it is important to keep in mind that this is the case. The time it takes to move people or equipment, or even the time it takes for explosives to get to their destination, often determines how long the time span will be. In such situations, it is important not to exaggerate the benefits of speeding up the decision-making process. It is also important to assess whether extending decision-making deadlines will introduce new risks or exacerbate existing risks. The outcome of the conflict is uncertain. It is possible that safety precautions and robustness will be sacrificed in favour of speed if this is seen as the most important factor in the decision to develop autonomous weapon systems. The result would be that the weapons would be less safe and reliable than they might otherwise be. Another danger is that time becomes the most important factor when choosing between competing autonomous weapon systems to develop. Despite these drawbacks, the increased speed that AI can

provide has clear military value, as evidenced by the large number of specialists who are committed to it. This advantage comes in the form of improved reaction time. MAF is using Human Resource Management Information Systems (HRMIS) to help them with decision-making by looking online at personal details and a list of posts. For example, they can also nominate personnel to attend the course by looking at the personnel course data. All officers can make an immediate decision to approve or not any leave application by personnel since all officers can access the system.

Use of Big Data

When the term “Big Data” is used, it often refers to data that is either too large to fit in a computer’s memory, generated too quickly for a single computer to process, or in a variety of forms and formats. Because of these three challenges, it can be difficult for humans to make sense of the data, although robots and artificial intelligence tend to perform better when provided with more data. The sheer volume of data generated by a multitude of sensors is beyond the ability of any one person or group of people to analyses. This is because so many sensors are involved in the process. It is expected that the practical use of AI will continue to grow in popularity as a direct result of the ever-increasing amount of data currently available all over the world. The use of big data is related to ICT. The importance of ICT has also been recognised and formally enforced by the Malaysian National Defence Policy (Malaysian Ministry of Defence, 2010), which stated that ICT usage is mandatory within the MAF as a means of achieving information dominance and that this usage must occur at all levels of the MAF. In reality, the Fourth Dimension MAF (4DMAF) plan proposed a capability-based approach that focuses on leveraging ICT to improve information operations efficiency (Manuri, 2015). To ensure that the Malaysian Ministry of Defence has systematic and competitive human resource management, the MAF began deploying the Human Resources Management Information System (HRMIS) in August 2013 (Malaysian MINDEF Internal Audit, 2017).

Better Vision and Targeting

Image processing is one of the areas where the effects of too much data are felt most acutely. The number of cameras used for surveillance purposes has increased significantly, both locally and internationally, and this trend is expected to continue. There is no denying that it is necessary and quite justifiable to automate the process of reviewing incoming videos and images. This justification is supported by the fact that an enormous amount of data is generated. As technology develops, these systems will become increasingly capable of distinguishing components that are invisible to the human eye, and in ever greater numbers. New developments in facial recognition could also be used to speed up the identification of known terrorists or militants. In addition, facial expression analysis could help the military and other members of the security forces identify potentially dangerous situations and better manage social interactions as they work towards keeping the peace. In line with efforts to improve how MAF protects national security, infrastructure, and assets, MAF has leveraged facial recognition technology to enable duty personnel to review recorded video footage to identify persons of interest after an event. It is also used in critical infrastructure.

Ocean patrols covering a large area are also more challenging for the RMN, which has limited resources. When circumnavigating the EEZ, which is 220 nautical miles long, the use of Eyes in the Sky is now a little more helpful in saving time. The use of AI can actually be helpful, especially in obtaining a particular distant view. An example of this would be the use of high-powered drones that can cover a wider area and be operated in a time-saving manner, as well as existing assets such as the RMAF’s BeachCraft.

Manpower Issues Mitigation

There are a number of unmet needs or latent requirements within the military, but there are simply not enough personnel to meet those needs. There is no doubt that the capacity of the armed forces needs to be maintained, but there is also a gap between the demand for certain activities and the people available to perform these tasks, which is often discussed. Some examples of these tasks are image analysis and foreign language translation. These are the tasks that arise from the exponential increase in the amount of data that needs to be processed. Fortunately for us, these are tasks in which artificial intelligence can increasingly support humans. Artificial intelligence is also important for supporting robots on the battlefield, enabling armed forces to maintain or expand their warfighting capabilities without using more humans. This is made possible by the use of robotic support through AI. By using AI in conjunction with robotic assistance, this goal will be achievable.

Cyber Defence Enhancements

As cyber warfare is a current and evolving military threat and is situated in the same digital universe as AI, it is only normal that there will be interactions between the two. As antivirus companies advance in the cat-and-mouse game between attackers and defenders, these intersections have already become more apparent. Antivirus software has traditionally relied on the detection of “tell-tale static tags”. These are essentially invisible graphics that stay in place and indicate that the code being examined is malicious. However, using static tags to identify malware is no longer sufficient, as malicious actors have developed methods to create malware with fewer tags. This means that the use of static tags alone is no longer sufficient to identify malware. The MAF has established a Cyber Warfare Signals Regiment (99 RSPS) in an effort to increase its capacity and preparation in the face of cybersecurity challenges and cyber threats from multiple areas. MAF are monitored constantly to counter any threat that could disrupt the MAF defence communication network. MAF always monitors and steps up its cyber security through its Defence Cyber and Electromagnetic Division (BSEP) and the Cyber Defence Operations Center (CDOC) but also protect the country’s strategic defence communications network.

Enhancements in Accuracy

Machines are fundamentally capable of achieving a higher degree of precision and accuracy than humans. For example, it is possible to use machines to produce electronic transistors, which are the building blocks of computers, even though the width of these transistors is only a few nanometers. Humans tend to think in terms of approximate estimates or round numbers, while machines are able to think in terms of floating-point precision, which easily encompasses 32 or 64 bits for each number represented. Machine precision also extends to AI. This is not to say that it is conceivable to know with absolute certainty the number expressed with 64-bit precision, but the precision is theoretically there to ensure accuracy. Because of the inherent properties of machines, such as the ability to maintain consistency from one machine to another over time, machines can be more precise than humans, but humans have more individual differences but get tired or bored.

The new Su-30MKM simulator centre for jet fighter operations training has been revealed by the Royal Malaysian Air Force (RMAF) at its base in Gong Kedak. Because multiple simulated aeroplanes can be used to conduct the training mission at once, an actual environment can be closely modelled. High-level fidelity in recreating an aircraft flight model is possible while training RMAF pilots, weapons sensor officers, and ground crew. Additionally, the new technology will increase the RMAF’s reputation as the region’s most technologically advanced air force.

The Future Soldier System (FSS) soldier upgrading initiative in Malaysia, which began in 2009, is in line with NATO's five capability areas: sustainability, mobility, survivability, lethality, and C4I (command, control, communications, computers, intelligence). The FSS is a "fully integrated infantryman combat system" developed by Sapura Thales Electronics (STE), a partnership between Sapura and French multinational Thales. It includes most of a modern soldier's load out, including Personal Protection Equipment (PPE, such as Oakley goggles, Kevlar helmets, and vests), and Special Operations Preferred Modification rifle attachments. FSS was adopted as a component of the Network Centric Operations (NCO) program of the Malaysian Army, which enables better synergy and collaboration over large distances.

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Thales develops capabilities and puts them into practice. These consist of communication and sensor solutions as well as command and weapon engagement systems such as TACTICOS. Thales offers a variety of ground and air warfare solutions, including naval combat systems and sensors. These system solutions support other systems from US and European manufacturers and

perform surveillance, command and control, combat and communication tasks. The level of risk mitigation for cyber-attacks in current and future operations is determined by data analysis based on AI and human factors.

Labor and Cost Reduction

AI and robots are increasingly taking over tasks that used to require the expertise of a human worker. This trend can be observed in all sectors of the economy. This development makes it possible for a single person to perform tasks that would previously have required a team of humans, and it also makes it possible for certain tasks to be performed entirely by machines. The military, which is a major employer, is no exception and could look for ways to reduce the number of staff without compromising the quality of service provided. In addition, AI has shown that it can improve or optimise a wide range of processes, leading to cost savings. AI has a lot of potential to increase efficiency and reduce costs.

The Small Arms and Leadership Immersive Virtual Training Simulator (VIRTSIM) is now fully functioning at the Army Simulator Centre in Gemas' Kem Sirajuddin. By utilising cutting-edge technology, Army soldiers to improve their combat skills, either individually or in groups, in all conditions. A soldier generally requires 10 sessions of training to learn the abilities required for battle, which is more expensive; however, with the new simulator, we can lower the cost because they may only require two sessions of field training after experiencing eight virtual sessions. Using virtual assets was also regarded as crucial in spotting suspicious actions in the border area. The Royal Malaysian Air Force (RMAF) has upgraded its radar systems to make its defence mechanisms competitive and strengthen the country's security systems. RMAF also upgraded its radar systems to make its defence mechanisms competitive and strengthen the country's security systems. In the military aerospace sector, Thales supplies advanced airborne mission systems and avionics to the RMAF for both its fighter and other mission aircraft. The advanced capabilities of these systems include maritime surveillance (AMASCOS for B200T) and target acquisition (DAMOCLES for Su-30).

Risks of Artificial Intelligence in Warfare

With the advantages mentioned above. However, AI also has the following downsides. The areas where AI in defence lags behind and needs improvement are listed below. Applications of AI in the military are likely to bring a variety of benefits; however, these applications also pose a significant risk. One must weigh the potential benefits of these capabilities against the risks they pose in order to conclude whether or not the use of AI in armed conflict is a wise policy decision.

Artificial Intelligence Systems Might Make Dangerous Errors

While the specialists we interviewed emphasized increased speed, precision, and accuracy as possible advantages of military AI, they also expressed concern that these systems might make decisions too quickly or be unable to adapt to the inevitable complexity of armed combat. As a result, they may have difficulty distinguishing between combatants and non-combatants and between threats and system anomalies, and they may end up being less precise and accurate than human operators. They also expressed concern that these algorithms make decisions far too quickly or are unable to adapt to the inevitable challenges of armed warfare. As a result, they may have difficulty distinguishing between combatants and non-combatants, and between hazards and system anomalies, and they may be less accurate and precise than human operators. If systems are put into operation before they have been sufficiently tested, or if adversaries manage to hack

or spoof them, the situation may become even more precarious. Emergent behaviour in machine learning processes has the potential to be catastrophic.

Arms Race or Escalation in Artificial Intelligence

Every country's pursuit of military AI in the hope of gaining an advantage in combat against potential enemies could lead to the proliferation of weapons and the arms race. Autonomous weapons may not respond sufficiently to political factors or escalation thresholds in a war situation. They could launch an attack at a time or place that would exacerbate the situation. To make matters worse, it would be difficult to assign blame or responsibility for these crimes to human operators. Combined with the likelihood of AI reducing the cost of fighting in terms of human lives, this could tempt commanders to take these risks and act more brutally, further exacerbating the escalation dynamic.

Reliability in Artificial Intelligence

There is a danger that the MAF commanders and leaders put too much trust in their AI systems. They may be prone to 'automation bias', i.e., relying on the results of AI systems even when those results do not seem to make sense. This tendency is amplified in systems whose computational processes are so complex that the results are incomprehensible. That is, system operators cannot readily determine how some of their mechanisms produce certain responses or behave in certain ways. The same is true of purported audio and video "deep fakes" that were produced by altering voices and likenesses. The latter has already generated buzz. A politician's audio clip could be altered using machine learning, a branch of artificial intelligence that deals with natural language processing, to make it appear as though they expressed racist or sexist opinions when in fact they didn't. If the clip's quality is sufficient to deceive viewers and avoid detection.

SUGGESTION OF AI APPLICATION IN MALAYSIAN ARMED FORCES

Application of Artificial Intelligence. Some strategies that could be taken by the MAF are to Develop guidelines and resources for the storage, sharing, gathering, and utilization of data in AI applications. Re-evaluate the requirements for the intelligence and intelligence needs for data that are necessary for expected AI applications. Develop testing and evaluation processes that are appropriate for non-deterministic and adaptive system types. Incorporate iterative development, experimentation, and evaluation into your workflow in order to speed up learning and improvements. Create all-encompassing training and educational opportunities to cultivate an appropriate level of trust in AI-powered systems. Make it a priority to become an efficient and quick follower of significant technological industry advances. Create guidelines for operational applications of artificial intelligence, particularly judgments that involve the use of force, in order to improve the safety of AI.

Establishing a consistent structure for data protection legislation and resolving any moral issues that may arise

The data drives artificial intelligence. As a direct consequence of this fact, it is of the utmost necessity to establish a consistent and long-lasting legal framework of mutual trust between the persons whose data are being collected and the enterprises that are collecting it. This framework needs to provide an exhaustive explanation of how data can be obtained, stored, processed, and distributed, as well as how it can be deleted. The requirement for the protection of individual data, and the sector's growing dependence on personal data. In addition, given the growing impact that

AI solutions are having in a variety of spheres of our lives, there is a need to have an obligation to make certain that the advancement of these technologies is beneficial to the welfare of people. It is also necessary to address the ethical challenges that are associated with this emerging technology (such as discrimination and prejudice; rejection of personal liberty, resorting, and privileges; and inexplicable results) to achieve this objective. Additionally, it is important to constantly promote the personally liable development and operation of artificial intelligence alternatives by means of a rigorous legal regime.

Creating an all-encompassing research environment and encouraging collaboration between businesses and educational institutions

The landscape of research into artificial intelligence technology is distinct compared to that of other areas of scientific research. The research potential of both corporations and academic institutions is valued equally. The availability of open data and the subsequent generation of that data are extremely important to the development of AI solutions. Nations that adopt an AI strategy ought to provide a method for establishing an industry-academia collaborative research environment within their borders, taking into consideration the strategic priorities and objectives of the nation. Obtaining the best possible personnel for both fundamental and applied research should be the primary focus, along with conducting an analysis of how the current incentive systems in research should be altered to encourage better integration of industry and governance across sectors.

Focusing primarily on investments in strategic industries

If MAF intends to thrive in the Fourth Industrial Revolution, it will need to make use of the comparative advantages and high-performing industries that their economies already possess. The MAF ought to centre the construction of its artificial intelligence ecosystems on the primary industries of Malaysia's economies. However, MAF should avoid allocating a small amount of resources across all areas because doing so will not result in the highest return on investment overall. This is especially true in developing nations, where there is typically less support available from the general public.

CONCLUSION

The applications of AI in the military are advancing rapidly. Some of the above benefits are already being achieved in current systems. Other benefits have been found in laboratory environments or regulated situations. Others are predicted based on forecasts of future AI advances or speculation about military applications for new technologies that have been proven or are being used in the private sector. The Fourth Industrial Revolution and the artificial intelligence underpinning it are bringing about profound shifts in how we live, operate, and connect with one another as citizens as well as how the MAF operates. It's possible that the complexity of this shift will appear overwhelming and daunting to some people and the MAF. It is important to keep in mind that all forms of technology are social constructs that are produced by the decisions that individuals and communities make. Artificial intelligence systems do not have other purposes other than those that humans have given them. On the other hand, unfavourable outcomes are possible in the event that we do not affect their evolution in a proactive manner. As a result, the present is not the time for looking back with regret; rather, it is the moment to consciously act in order to build a prosperous future.

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THE APPLICATION OF ARTIFICIAL INTELLIGENCE (AI) IN PEACEKEEPING OPERATION

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ABSTRACT

Today, the Industrial Revolution 4.0 (4IR) requires one to accept the reality of advancements in computer technology. The contemporary computer system technology has infiltrated many physical technology and human life systems. This is what is known as Artificial Intelligence (AI). The characteristics of AI are closely related to a computer system programmed to maximize human behaviour and roles. AI is a wide and progressive field that has grasped the entire control of artificial and digital technology and robotics. Innovations in AI have opened up new research involving efforts in explaining and replicating human behaviour, recording, modelling, and storing human intelligence in the information technology system and training or programming systems to execute human tasks. AI is the ability of a computer system programmed in a machine to understand, think and learn in a way similar to humans and to possess intelligence just like humans.

Keywords: *Technology-driven, Internet, Peace Keeping, Intelligence, Machine Learning, Cyber Defence*

INTRODUCTION

The increasing amount of available data, mainly due to better access to the Internet in countries where peacekeeping missions take place, has led to the technology-driven transformation of the operational environment. This comes at a time of significant developments in the field of artificial intelligence and particularly machine learning, most of which applications still rely on massive amounts of data. As such, these developments have promising individual initiatives to exploit this new and growing potential for the United Nations.

For 75 years, UN Peacekeeping has been one of the most important tools for mitigating conflicts and promoting peace and security around the globe. Helping countries navigate the difficult path from conflict to peace, peacekeeping boasts some unique strengths, including legitimacy, burden sharing, and an ability to deploy and sustain troops and police forces from around the globe, integrating them with civilian peacekeepers to advance multi-dimensional mandates. Today's peacekeepers are called upon not only to maintain peace and security, but also to facilitate the political process, protect civilians, and assist in the disarmament, demobilization and reintegration of former combatants (Nations, 2022). They also play a key role in supporting democratic efforts such as organizing elections, protecting and promoting human rights, and assisting in the creation and restoration of the rules of law.

In addition to peacekeeping operations, the UN operates special political missions (SPMs) engaged in conflict prevention, mediation, and post-conflict peacebuilding around the world. Authorized by the Security Council, SPMs are tasked with an array of responsibilities, including supporting political dialogues and reconciliation processes, facilitating free and fair elections, monitoring human rights violations, coordinating international development and humanitarian assistance, and encouraging the development of effective rules of law institutions. Funded by Member State dues, SPMs account for nearly one-quarter of the UN's regular budget.



Figure 1: United Nations Peace Keeping Worldwide

AREAS OF IMPLEMENTATION IN PEACEKEEPING OPERATIONS

There are currently 12 peacekeeping operations deployed across Africa, the Middle East, Europe, and Asia. UN Peacekeeping is made up of more than 90,000 total field personnel, with 125 countries contributing troops, police forces, and civilian personnel, including several dozen peacekeepers from the U.S. As early as 1996, researchers have used machine learning (ML) to predict conflicts. Today, mainly due to significantly higher amounts of available data, advancements in computing power and the progress made in natural language processing, several artificial intelligence (AI) tools have been added to the peacekeeping arsenal. The surge of available data has mainly been caused by the rise of mobile phones and improved access to the Internet. The potential for companies such as Facebook to amass profits from their access to, and the use of, people's data makes it lucrative for them to provide access to the Internet at a much lower price. Thus, the equipment is now affordable for people in relatively poorer countries, which is where most peacekeeping operations take place. All of these developments constitute a technology-driven transformation of the environment of peacekeeping operations. Therefore, the changing environment that increases the potential for the application of AI tools in peacekeeping operations is categorized into three main areas: general military tasks, conflict prediction, and specific peacekeeping tasks during an operation (Coleman, 2014).

First; Specific Task

Some of the most ambitious AI tools for specific peacekeeping tasks set the objective of ‘deep conflict resolution’[20], taking into account the needs and perceptions of all participants. Here, AI is used to process knowledge on conflict dynamics and to present it in an easily accessible way to the users in the field. This would lead to the decentralization of knowledge and the reduction of a mission’s dependence on experts in psychology, conflict resolution, and local culture. The software cogSolv claims to provide the users with ‘options leading to truly just results. This is achieved by simulating a specific situation and, for example, suggesting to base efforts for conflict resolution on ‘Local Dignity’ instead of ‘Human Rights Discourse’.

Significant advancements in natural language processing (NLP) enable the creation of powerful translation tools, which could enhance the interoperability in multinational peacekeeping forces as well as facilitate communication with the locals. Arguably, the capability of computer programs to process language and identify objects is deemed more valuable in unlocking the tools to analyze open-source information, most importantly gathered from the social media. A UN Global Pulse lab has used NLP to analyze radio shows in Uganda, notably including statements of people who called into the radio station, in order to gain insights into social tensions. This access to unprecedented amounts and forms of information can provide peacekeeping missions with a better understanding of the environment they are operating in, but it could also be used for smarter reactions to emergencies based on informed decision-making. However, this – as well as the deployment of UAVs – raises concerns about privacy and who will have access to intelligence gathered by the UN or in the course of a UN operation. Beyond that, the digitization of the UN operations might create additional vulnerabilities and establish an even more complex conflict environment by including cybersecurity risks.



Figure 2: Areas of Implementation in Peacekeeping Operations

Second: Conflict Prediction

The application of machine learning tools significantly increases success in predicting conflicts. This can enhance the ability to understand conflict dynamics and allow for a design of peacekeeping operations that is more appropriate for preventing re-emerging or new conflicts. For example, using ML techniques such as lasso and random forests, Blair et al. found that – contrary to previous belief – ‘the risk of local violence is higher rather than lower in communities where minority and majority ethnic groups share power’. The knowledge drawn from the ML-driven analysis could be used to enhance prevention capabilities, thereby avoiding a situation in which a peacekeeping mission has to be established in the first place. It can also be applied on a tactical level, enabling a smarter allocation of resources for day-to-day tasks. An important aspect here is the use of geographic information systems (GIS) which has greatly benefited from the commercialization and subsequent affordability of satellites and satellite imagery. Machine learning tools have been utilized to analyze these massive amounts of data. Unmanned aerial vehicles (UAVs) can also contribute to this collection of data. Unarmed drones were first deployed by the UN in 2013. The information obtained from the use of GIS can facilitate a broad range of tasks beyond conflict prediction, including the monitoring of borders and sustainable development, the support for elections and other governance tasks as well as field logistics.

Third: General Military Task

Among all the areas mentioned, the general military tasks have the potential for the optimization and automation of administrative processes such as logistics, increasing not the effectiveness but the efficiency of military operations. This could lead states to be more willing to participate in peacekeeping missions; if more personnel or equipment is deployed while the costs remain constant, the gap between mission goals and available resources can be reduced. Additionally, AI-based virtual training can be used to enhance soldiers’ tactical abilities, thus contributing to the mission’s success while mitigating casualties. Sharing such programs with less developed countries – who are overwhelmingly the main troop contributors to United Nations (UN) missions – could compensate for the lack of resources that results in insufficient training for soldiers facing complex situations in peacekeeping operations [9]. Beyond that, this would certainly be in the interest of more developed countries seeking to enable local forces to take over the responsibility for the security of their own countries; one classic example would be the European Union Training Mission Mali.

In light of the numerous benefits that the application of AI for peacekeeping can yield, it is worthwhile to take a look at the effort the UN is making to make the most of this technology. The UN-issued 2015 Report of the Expert Panel on Technology and Innovation in UN Peacekeeping explicitly mentions AI once – in the annexe. The Secretary General’s Strategy on New Technologies recognizes the importance of AI but speaks of ‘exposure to new technologies’. Nonetheless, the increasing trend where several UN departments have already made use of AI and machine learning, the Centre for Artificial Intelligence and Robotics being in the process of establishment in The Hague and Big Data analysis were among the main topics discussed at the 5th International Partnership for Technology in Peacekeeping Symposium in May 2019. In 2013, John Karlsrud argued that in comparison to other UN activities, the possibilities of Big Data are underutilized for peacekeeping. Clearly, the UN is aware of the possible benefits. However, the shift from “exploring” and “raising awareness” to “regulating” and “committing resources” on a systemic level has yet to take place.

AI: APPROACHES IN SUPPORTING PEACEKEEPING OPERATIONS

As the UN peace operations are increasingly drawing upon digital technologies to gather and analyze information – and also accessing the data generated by other users of digital technologies like social media and cell phones – they have to reflect on the cost and benefit of sharing this wealth of information beyond the mission. Moreover, the UN Security Council may wish to consider how this information can enrich its own deliberations and to what extent information-sharing should feature in peacekeeping mandates. The dissemination of information such as drones or satellite images beyond the mission serves three purposes. First, providing some raw data to the UN Security Council can help the latter achieve a common interpretation of events in the area of operation, and may inform the discussions that lead to the Council’s decisions. Second of all, sharing some of this data with the UN country team and with humanitarian aid providers improves the speed and efficiency of the latter’s response to humanitarian crises. In this context, the UN Secretary-General’s Data Strategy (2020: 4) established “a culture that values openness and sharing by default” as one of the organization’s goals. The Humanitarian Data Exchange, a platform spearheaded by OCHA that enables the UN system, NGOs, governments, and universities to improve data sharing during emergencies, helps turn this aspiration into practice. Finally, sharing fine-grained (but anonymized) conflict event data with researchers can dramatically improve our collective understanding of contemporary armed conflicts and the corresponding resolutions. More than a decade ago, systematically compiled conflict event data on Afghanistan and Iraq was made available (in anonymized and declassified format) to researchers. This resource inspired a large body of empirical scholarship on contemporary armed conflicts with substantial policy implications (e.g., Berman et al. 2018). By sharing more fine-grained and anonymized event data with researchers, the UN could facilitate rigorous studies and obtain hard evidence on the effectiveness and efficacy of UN peace operations at a time when many member states face resource scarcity and competing priorities.

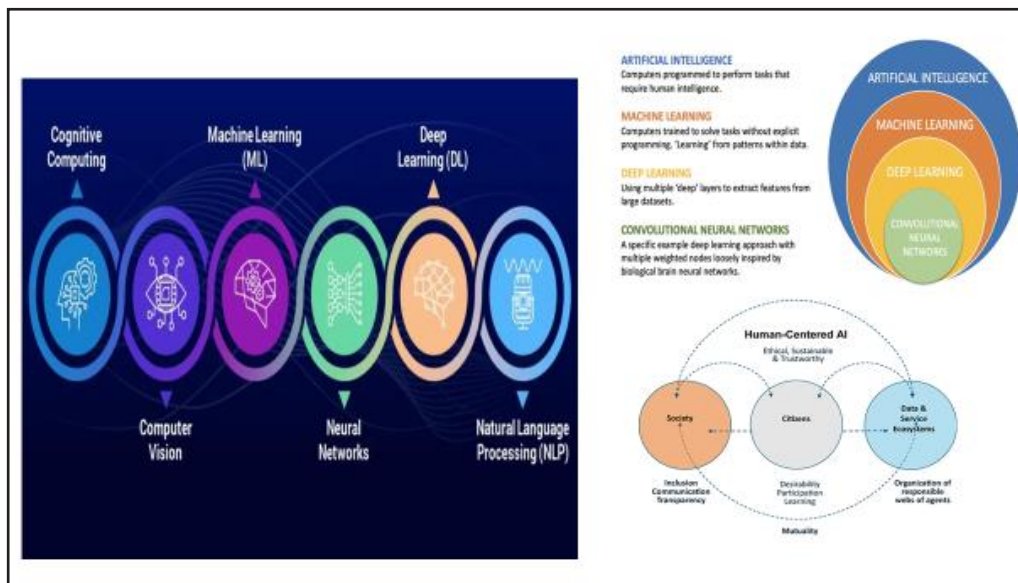


Figure 3: AI; Approaches in Supporting Peacekeeping Operations

ARTIFICIAL INTELLIGENCE CAN SUPPORT UN PEACE OPERATIONS IN FIVE SPECIFIC WAYS.

Firstly, it can help optimize and automate administrative and logistical processes, thereby enhancing the efficiency and effectiveness of UN missions. For instance, natural language processing software helps with translations that facilitate communication with the local population and between UN staff members (Ibid.). AI-based virtual tactical training could help prepare UN peacekeepers to implement complex mandates in difficult settings while also mitigating the risk of casualties.

Secondly, machine learning techniques can be used to anticipate future conflicts. They have been employed to predict local violence in Liberia, combat violent events in Africa and the outbreak of civil war around the world. Moreover, natural language processing software can be used to analyze radio and social media data in order to assess risks of future conflicts. For instance, a UN Global Pulse lab relied on natural language processing to analyze radio shows in Uganda in order to assess social tensions. In Somalia, a UN Global Pulse lab analyzed fake news on Facebook, fake Facebook posts, and fake Facebook groups as well as trending topics and thereby improved the situational awareness of the social media terrain.

Thirdly, machine learning can be used to respond to ongoing or impending crises more effectively. For example, deep learning — a more complex method of machine learning that uses “neural networks” to “learn” a particular set of tasks — has been used to identify the size and location of refugee camps in Syria for improved humanitarian responses, and to prevent overcrowding. The destruction of cities caused by civil wars and natural disasters can, similarly, be used to better allocate funds aimed at rebuilding.

Fourth, AI can assist with the analysis of the video and remote sensing data gathered through satellites, drones, and CCTV. Specifically, AI can detect humans, vehicles, objects, events, and patterns in videos. Recent applications range from the real-time analysis of crowd size and behaviour (e.g., the direction of movement and interactions in the crowd) to automatic license plate recognition. AI can also send alerts, e.g., when it determines that a human is present on a live video taken in a restricted area or when it notices a cloud of smoke from a fire or explosion. Such uses require relatively simple algorithms that are programmed to sound the alarm when specific conditions are met. In a more complex way, self-learning software can be instructed to learn patterns of ‘normal’ behaviour by watching a video or remote sensing data and to recognize events that depart from these patterns. For instance, such behavioural analytics recognizes a break in patterns - and can sound the alarm - if a street that is usually empty at night is suddenly crowded or used by a convoy of trucks.

Fifth, AI can help detect deep fakes. Advances in machine learning and computer graphics make it easier to convincingly manipulate audio and video recordings, and UN peacekeepers have to anticipate that conflict parties will increasingly use deep fakes in psychological operations, propaganda, and diplomacy in the area of operation. In turn, AI also informs cutting-edge software programs to detect deep fakes. Swift advances in technologies to produce deep fakes require constant efforts to enhance the sophistication of AI-based approaches to detect them.

Harnessing the possibilities of AI for these tasks requires both access to high-quality data and expertise in relevant methods. The necessary tools will vary depending on the goal, but they often share certain common features. Translating images, text, or otherwise unstructured information into usable data typically requires a classification method, often done through machine

learning. This, in turn, usually necessitates a large, manually classified set of “training data” that can be used to build effective models. Developing this training data can be labour intensive, although it can often be crowdsourced through platforms. Even using pre-existing data sources, effective prediction requires the knowledge of machine learning methods and validation techniques. To fully harness these tools, the UN could build in-house expertise or partner with external experts.

UN peacekeepers could fruitfully apply machine learning techniques to the analysis of the fine-grained data gathered in the SAGE system. Such analyses could provide insights for early warning and conflict prediction, and they could potentially benefit planning and resource allocation at the strategic and tactical levels. Of course, the challenge of successfully translating early warning into timely action is beyond the realm of artificial intelligence.

AI AND MALAYSIA ARMED FORCES: LEARNING FROM OTHERS

At present, Malaysia’s peacekeeping force is still utilizing the standard or normal methods of conducting its operations. Nonetheless, plans have been made to embark on AI technologies in future operations. At this point, we need support on the technical aspects of training and perhaps capacity building. AI technology has reached Malaysia for other disciplines, therefore much development has been ongoing. Our universities ventured into the subject of AI a long time ago, although it is still in its infancy in Malaysian military applications.

The MAF will be transformed by the use of artificial intelligence-based technology. Years of preparation have led to the government’s support and aspiration to modernize the military through AI. A culture of cutting-edge innovation and collaboration has been cultivated, thanks to bold initiatives, earmarked budgets, policy changes, and indigenous support. In the areas of data, logistics, surveillance, weapons and much more, this collaboration between the public and private sectors, research organizations, academic institutions, start-ups and entrepreneurs has helped develop many innovative AI-based tech products. The integration of autonomy into weapon systems, ISR (Intelligence, Surveillance, and Reconnaissance) and data management could be an important aid in preventing terrorism, implementing counter-terrorism measures, and protecting troops

As for Malaysia’s armed forces, even though the AI application is not as robust as in other countries, progression and improvement are on their way in the form of the use of big data. The use of big data is related to ICT, whose importance has also been recognized and formally enforced by the Malaysian National Defense Policy. The policy has stated that ICT usage is mandatory within the MAF as a means of achieving information dominance and that this usage must occur at all levels of the MAF. In reality, the Fourth Dimension MAF (4DMAF) plan proposed a capability-based approach that focuses on leveraging ICT to improve information operations’ efficiency.

Cyber Defense Enhancements

The MAF has established a Cyber Warfare Signals Regiment (99 RSPS) in an effort to increase its capacity and preparation in the face of cybersecurity challenges and cyber threats from multiple areas. MAF has been monitored constantly to counter any threat that could disrupt the MAF defence communication network. MAF always monitors and steps up its cyber security through its Defense Cyber and Electromagnetic Division (BSEP) and the Cyber Defense Operations Center (CDOC) but also protects the country’s strategic defense communication network.

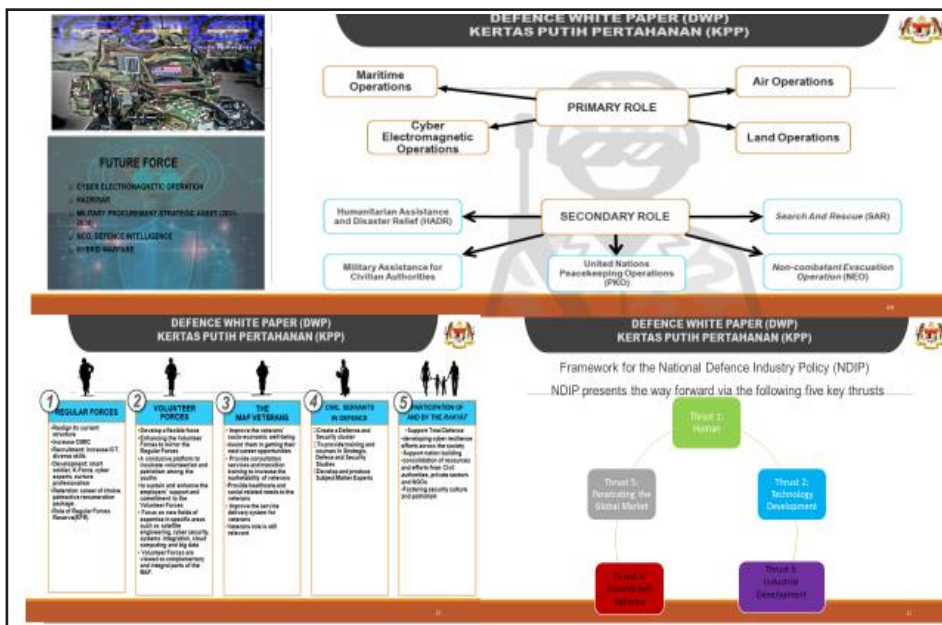


Figure 4: Malaysia Defence White Paper

Developing the Future Soldier System (FSS)

Intelligence, Surveillance, and Reconnaissance Improvements. AI will enable far better insights to be gained from the vast amounts of ISR data that will be collected. MAF has already used drones for border control, but their number must be raised so that all security agencies can use them. MAF anticipates that the employment of drone assets will improve the effectiveness of border monitoring and control activities.

Defence White Paper

However, in the Malaysian Defense White Paper, certain chapters regarding efforts and future plans for AI have been highlighted. It is probably worth mentioning beforehand that the Defense White Paper is a public document that can be accessed and read by all Malaysians and those interested in it. It represents the Government's firm commitment to Malaysia's defence and resilience to protect national interests (Defence, 2020). It details the Government's stance on national defence, presents its outlook for strategic trends and outlines the National Defense Framework to pursue the vision of Malaysia as a secure, sovereign and prosperous nation. The DWP is to come into effect for a ten-year-period from 2021 to 2030 and adopting the Whole of Government (WoG) and the Whole of Society (WoS) approaches comes in 8 chapters but among all the chapters, chapters 4, 5 and 7 have significant relations regarded AI.

Chapter Four. This chapter discusses the primary and the secondary roles of the Malaysian armed forces. In order for them to efficiently execute their roles they need to be equipped with the necessary equipment, machinery and tools. It also sheds light on the requirements needed by the Malaysian armed forces in the future in order to protect the nation's interests as have been discussed in the previous chapter. This chapter outlines the need for strengthening intelligence, air defence

and air strike capabilities, maritime strike and sustainment, enhancing firepower, improving mobility, and also the role of the cyber-electromagnetic domain. So far, at the operational level, the Defense Cyber and Electromagnetic Division has been established aiming to strengthen the cyber capability of the Malaysian Armed Forces (MAF).

Chapter Five. Chapter five focuses on the people and their role in defending the sovereignty and security of the country. It brings the message that the responsibility of protecting the nation is not solely a burden of the enforcement agencies such as the military or police, but it is also the responsibility of each citizen who was born and raised on Malaysian soil. It also emphasizes the importance of developing a Knowledge Force (K-Force) to face future security challenges that require an understanding of advanced technology. In the areas of data, logistics, surveillance, weapons and much more, this collaboration between the public and private sectors, research organizations, academic institutions, start-ups and entrepreneurs could help develop many innovative AI-based tech products.

Chapter 7: Defense Industry, Science and Technology. The DWP describes the defence industry as “a strategic component of Malaysia’s defence ecosystem” and the Defense Industry Policy carries five main thrusts as follows, Thrust 1: Human Capital Development- to produce and develop experts with the right skills and knowledge, Thrust 2: Technology Development- Providing funding for local R&D capabilities and transfer of technology from foreign strategic partners, Thrust 3: Industrial Development, Thrust 4: Towards Self-Reliance, Thrust 5: Penetrating the Global Market.

APPLICATIONS OF AI IN COVID 19 PANDEMIC

Although the Malaysian artificial intelligence scene is not as vibrant as that of other countries, we still have plenty of A.I. technology incorporated into the local technology, software, processes, and apps and it is widely used during the pandemic. My Sejahtera, for instance, is an app used to help check and control the spread of COVID-19. My Sejahtera also serves as a contact tracing app. The system taps the machine learning capabilities to identify possible sources of infection for each confirmed case and maps them geographically. Meanwhile, Malaysian emergency response authorities use cloud computing platforms to improve search and rescue (SAR) operations. The emergency response agencies use the Search and Rescue Operation Coordination System (SAROCS) to support the planning, execution, management, and coordination of SAR activities during an emergency. The cloud-based SAROCS enables data from multiple devices and systems to be integrated into a single platform, allowing various SAR agencies to access crucial data to facilitate an operation remotely.

Despite all efforts, the road is still long, and a lot of effort needs to be exerted. Therefore, the areas that need to be emphasized are developing a national AI strategy, establishing an environment that is conducive to the successful application of AI establishing a consistent structure for data protection legislation to resolve any moral issues that may arise and Synergizing AI research projects between military, industries and research universities.

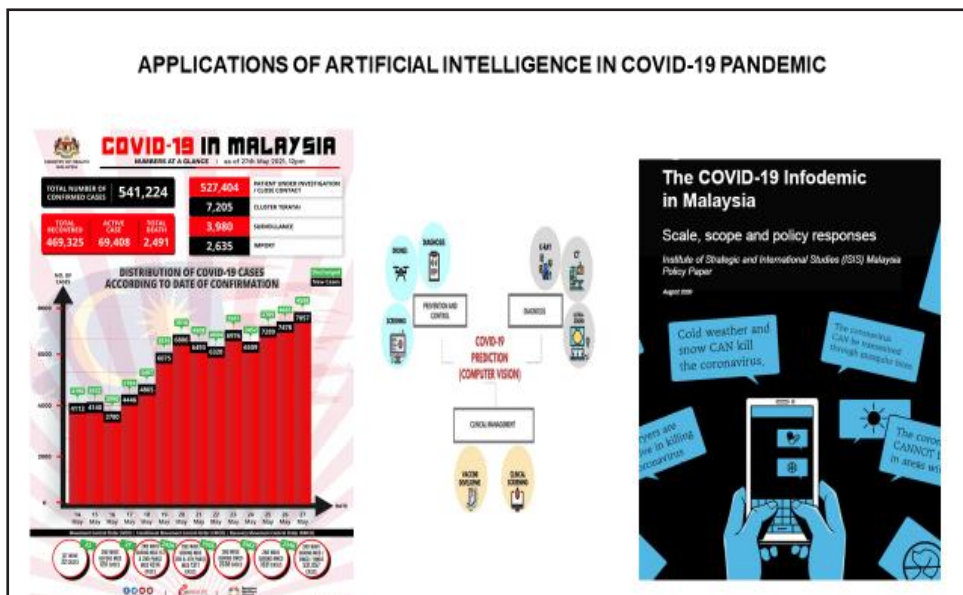


Figure 5: AI during Pandemic in Malaysia

CHALLENGES AND OPPORTUNITIES

The use of digital technologies for monitoring, surveillance, analysis and decision-making in UN peacekeeping operations is nothing new. UN infantry battalions have always possessed a military intelligence arm as one of their twelve core functions and analysts have identified a wide array of digital technologies that have been deployed in missions over the years to enable and enhance their ability to monitor and analyze their surroundings. What is new are the types of threats and trends that missions seek to understand; the power and sophistication of the capabilities available to peacekeeping; the volume and structure of data they generate; and the complexity of the management of these tools in a peacekeeping environment. Let us address these trends in turn. Across many operations, peacekeepers are being asked to interact more proactively with increasingly dynamic threats. Expectations around the protection of civilians are higher than ever, and combined with budgetary and political pressures to downsize missions, they have prompted several missions, notably UNMISS and MONSUCO, to adopt centralized, but highly mobile, concepts of operations. These concepts foresee real-time situational awareness across enormous geographic areas to enable rapid projections of force to protect civilians. At the same time, peacekeepers in some missions are coming under diverse forms of direct attack from conflict parties and, in some cases, civilian populations, demanding comprehensive and real-time tactical awareness of their immediate surroundings as well as a nuanced understanding of local perceptions, political discourse, and the information environment in which they operate. The capabilities of the digital technologies that are accessible to peacekeeping missions today are exponentially more powerful than those that operated a decade ago.

What was once decentralized and unstructured – yet substantively rich and deep – information gathered by peacekeepers is now becoming increasingly centralized and organized data. Quantitative and qualitative tools are being brought together, to present considerable new opportunities for analysis, if the information can be effectively harnessed. More data-driven

analysis tools promise to improve the insights and predictive capacity of mission personnel across a broad range of tasks, from the protection of civilians to political strategies to local conflict prevention, but only if the information can be shared in a way that balances the need for broad access with operational security and human rights concerns.

Information Requirements Management and Tasking

Several challenges stand in the way of this. First and foremost, with some exceptions, most senior leadership in peacekeeping operations have yet to engage fully with peacekeeping intelligence processes

Authorities, Limits, Law and Ethics

Information gathering in peacekeeping operations has always invoked ethical and human rights considerations about, for example, the security of sources, the provenance of information from security services, and the protection of personally identifiable information. With the introduction of PKI/SA technologies to peacekeeping operations, the risks and challenges in this area have expanded exponentially and may have broad reputational and normative consequences

AI, Machine Learning and Predictive Analysis

Effective data use will enable the UN to “forecast outcomes far more effectively than conventional techniques based on static historical reports.”. For peacekeeping purposes, data-driven predictive analysis could contribute to two levels of analysis. Firstly, within missions, the objective is to achieve “predictive peacekeeping”, wherein threat prediction can occur at a sufficient level of detail and precision, and with sufficient warning to enable missions to plan and execute a response. The analysis for machine learning in peacekeeping could analyze large amounts of data across missions to deliver insights on best practices in mission responses, highlight outlying strategies, or compare and analyze peacekeepers’ performance.

Information Ownership and Sharing

Uniformed peacekeepers have always been subject to their national doctrine and military/police frameworks. This is true both explicitly, and in the sense that they retain internal command structures, administrations, and disciplinary responsibility. Implicitly, in the absence of clear rules or guidance on a particular matter, it would only be natural to expect a unit to revert to its national doctrine. This challenge arises in several areas: Information ownership, Custody And Reach-Back, Transparency, Oversight And Accountability Information sharing and the Human Rights Due Diligence Policy

Machine Learning and Predictive Analysis

When it comes to its own capacity for data-driven and predictive analysis, the field of peacekeeping needs to, not only work through its pervasive problems of information fragmentation and subsequent lack of trust in information processed at the operational level, but also prepare to mitigate potential threats to the integrity of its own datasets and analytical processes. Effective mechanisms should secure the diverse digital repositories (from ad-hoc reporting systems in missions to more centralized efforts) that process sensitive data about situational awareness and populations’ routine activities.

Without robust (AI and cybersecurity) safeguards, data-driven peacekeeping could lead to unintended harm and erode public trust. Far beyond violations of privacy, unintended harm includes collective data breaches with serious security implications, especially when data is gathered from vulnerable populations. The UN has already been the target of offensive cyber-attacks, thus, sixteen strong rules are needed to enable the determination of who will have access to sensitive information.

Ethical Risk Management for Sensitive, Intrusive Surveillance Technologies

In general, the procurement and deployment of PKI/SA technologies into peacekeeping operations have proceeded much the same way as other information and communication technologies, in that operational support components of the Secretariat have largely managed these processes

Information Security

In response to the increased sensitivity of some of the information it gathers, and the greater security exposure that the centralized digital storage brings, the UN has employed enhanced physical, technical and administrative measures for much of its data. The measures to mitigate the risk of accidental or malicious misuse of data in the system, including measures to implement existing information management policy and guidance, as well as enhanced measures such as the maintenance of audit logs must be implemented seriously.

WAY FORWARD

The diverse array of digital technologies for peacekeeping intelligence and situational awareness inventoried in this paper clearly establishes that these types of technologies now constitute a key component of the technology portfolio. As missions have strived to keep pace with the evolution of threats and the pace of technological change, the tools they deploy for these purposes have become exponentially more powerful and complex. This paper's analysis of the capabilities, impact and challenges associated with PKI/SA technologies leaves us with three overall conclusions that could inform a new strategy for the technology in peacekeeping.

Firstly, PKI/SA technologies, especially surveillance technologies, constitute a unique category of tools within peacekeeping, and within the Organization. Many of the more advanced and/or intrusive surveillance technologies deployed in peacekeeping operations in recent years pose considerable risks to human rights in their use as well as in the use of the information they generate. This reality does not disqualify them from the use, but it does demand a tailored approach to the design, procurement and management of surveillance technologies that appropriately blend policy, political and human rights considerations with more traditional technology management practices. The Secretariat's current treatment of these technologies is much more akin to a "business as usual" approach and exposes the Organization to considerable legal, political, ethical, and operational risks.

Secondly, the impact of PKI/SA digital technologies will dramatically depend on more consistent, structured and analytically appropriate data. Moving beyond the important gains in short-term, tactical situational awareness brought by camp security technologies towards the goal of "predictive, data-driven analysis" and the potential application of machine learning will require further efforts to bring consistency in the volume and content of data entered across time and space in each mission. This is a very challenging task, considering the diversity and rapid rotations

of uniformed personnel, varying skill levels and available capacities across missions, and the complexity of the subjects being recorded. While considerable improvements have been made in recent years, a more transformative change will be required in the ubiquity of data gathering and entry will be required for tools like Sage or Unite Aware to fully deliver to meet their goals. Along the way, DPO should remain mindful that peacekeeping missions' qualitative analysis and insights developed by virtue of their proximity to the ground, relative legitimacy, and individualized analytical regimes are invariably the subject of envy among organizations with infinitely greater resources and technological capacities. Better quantitative analyses should not come at the expense of solid fieldwork and dogged inquiry.

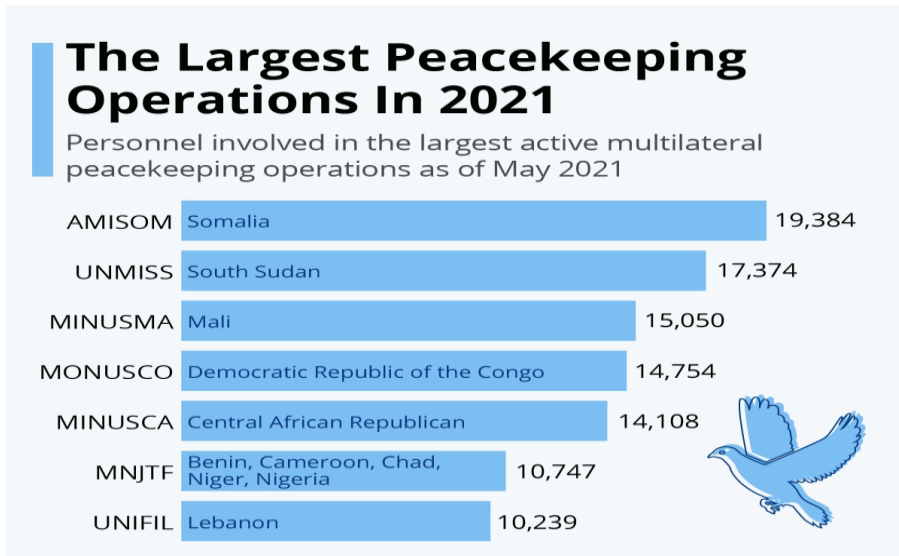


Figure 6: Largest Peacekeeping Operations Worldwide

Finally, the UN's technologies for monitoring, surveillance, information management, analysis and dissemination need to be understood and planned for as part of a PKI/SA ecosystem that blends technology, policy and practice. The purposes and specific cases of individual technologies must be systematically defined in relation to PKI/SA policies and processes – notably, the peacekeeping-intelligence cycle – and in relation to one another. Despite an almost insurmountable constellation of competing institutional interests, some progress has been made in recent years to bring different tools and approaches closer together. However, in the absence of a definitive leadership vision and corporate decision-making, the inter-relations among these tools and approaches will continue to be decided in the bureaucratic trenches, with transaction costs that can be measured in terms of lost opportunities to improve the effectiveness, efficiency and responsibility in peacekeeping. DPO and DOS are in dire need of unified, peacekeeping-wide leadership to define a vision for the PKI/SA ecosystem and adjudicate the respective roles of the tools, processes and practices within it.

CONCLUSIONS

To sum up, peacekeeping operations have expanded over the years. The use of AI applications will assist in present and future operations. Peacekeeping Operations also need to keep up-to-date with the latest technologies. Additionally, the R&D between peacekeeping operators and AI industries is vital for future developments and improvements. Countries that have yet to apply AI

in their peacekeeping operations must learn from those that have applied the technology- António Guterres, United Nations Secretary-General was quoted verbatim, “Be bold, be revolutionary... and disrupt...because without innovation, there is no way we can overcome the challenges of our time.”

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Henderson, D.A., The looming threat of bioterrorism, *Sci.*,283: 1279-1283, 1999.

Online Sources

Hurlbert, R.E., Chapter XV, Addendum: Biological Weapons, Malignant Biology, Available from <http://www.wsu.edu/~hurlbert/pages/101biologicalweapons.html>. (Accessed on 30 January 2010).

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