



## **MASTERING OF ARTIFICIAL INTELLIGENCE TO STRENGTHEN INDONESIA'S MARITIME DEFENSE**

### **ABSTRACT**

RAMADHAN SUBAKTI. Mastering Of Artificial Intelligence To Strengthen Indonesia's Maritime Defense. Lecturer by Ir. Budi Rahardjo, M.Sc., Ph.D.

Artificial intelligence is the first choice of developed countries to be included in the defense system. As a maritime country, Indonesia needs to accelerate with future artificial intelligence, so that this technology is expected to be able to utilize its marine resources, increase state profits, and challenge the welfare of the people of Indonesia. Human resources hold important control over the emergency of artificial intelligence. However, in the process of mastering artificial human intelligence, Indonesia has limitations in terms of intelligence capabilities in the maritime sector. To encourage this ability, it is important for stakeholders to carry out positive synergy and diplomacy. Training and education institutions become real forums in preparing human resources who question intelligence created with new capabilities and new abilities in facing challenges in the maritime sector. This paper considers whether Indonesian human resources have manifested the mastery of artificial intelligence as an adaptation to the development of intelligent sensor technology, network technology (IT / IoT / Comms), intelligent data analysis, artificial intelligence (AI), sophisticated robotics, additive manufacturing (AM), augmented reality and mix, a limited and fully autonomous operation that must be available to an archipelago like Indonesia, which has a watershed of 2/3 of the land area of about 5.8 million km<sup>2</sup>, with a coastline of 81,000 km<sup>2</sup>.

Key Word : Artificial Intelligence, Maritime Defence, Human Resource,  
Training, Education

### **INTRODUCTION**

Global security and the strategic environment currently affect national defense. One dynamic that needs to be examined over the next five years is economic growth and how it will affect regional military strength. Dynamics determine the pattern and form of challenges that are increasingly complex and multidimensional by

continuing to improve military and non-military security, and the threat of hybrids that can be categorized as factual and non-factual. These threats include terrorism, radicalism, separatism, and rebellion as a result of fighting, natural disasters, seizure, sea piracy, and security of natural resources, epidemics, cyber attacks and espionage, human and drug trafficking and tactical war or war. In the condition of the state it cannot prevent from the environment which is triggered by ideological, political, economic, socio-cultural, and security factors. This development is a challenge in the management of national defense in the maritime field.

The Indonesian archipelago has a strategic position. Not only because it is between the continents, Asia and Australia, but also because the islands are located between two oceans, the Pacific and Indonesia. This position makes the Indonesian Archipelago a place of cultural crossing in international relations in the region. The Unitary State of the Republic of Indonesia is the largest archipelago country in the world with the northern region approved and approved by its sovereignty and maritime sovereign rights by the United Nations Convention on the Law of the Sea (UNCLOS) and Law No. 17 of 1985 concerning Ratification of UNCLOS. As the largest archipelago in the world, the vast sea area of the Republic of Indonesia reaches 6.65 million km<sup>2</sup> or around 76.94% of the total area of the country which reaches 17,499 islands stretching from Sabang to Merauke (Ramdhan and Arifin, 2013).

Thus the execution of Indonesia's maritime defense is very necessary, intended to safeguard and protect the country's sovereignty, territorial integrity, and safety of the nation and marine resources. To solve problems related to and influence national defense, Indonesia must prioritize diplomacy supported by modern military forces through artificial intelligence. To respond to every dynamic, Indonesia actively encourages global partnerships, promotes a spirit of togetherness and builds a dynamic balance, a condition marked by the absence of a dominant state power in the region. It was founded on the basis of trust as an opportunity for increased cooperation and partnerships to increase the country's defense power in the territorial waters.

## LITERATUR REVIEW

### Military Defence Resources

The Support Component consists of citizens, natural resources, artificial resources, and national facilities which are prepared and organized in order to increase the power and the capability of the Main and Reserved Components.

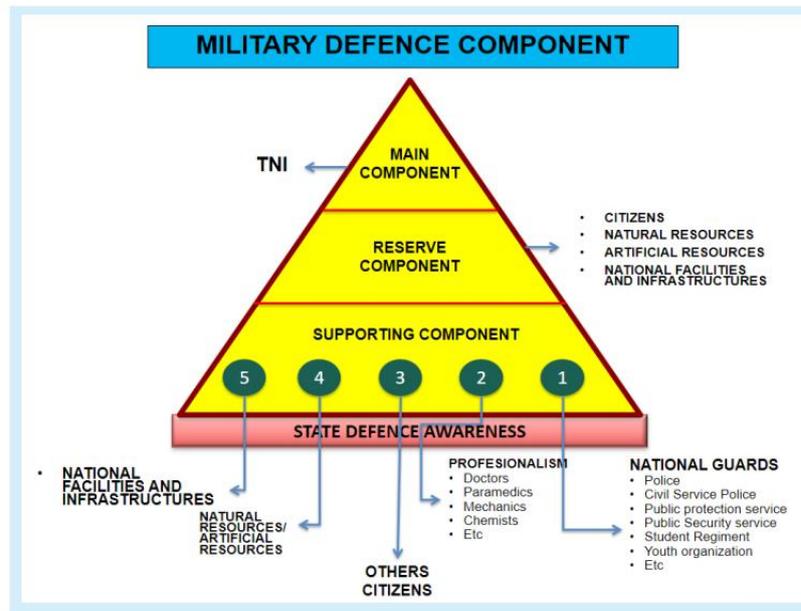


Figure 1 : Military Defence Component

Sources : Defence White Paper

### Future Threats

Threat Estimation is the main factor that contributes to the preparation of the design of national defense systems, both actual and potential. This is based on strategic analysis and identification of the very dynamic nature of threats; thus allowing various threats to be combined. Therefore, current and future threats can be classified into three types: hybrid threats, military threats and non-military threats. The source of the threat may or may not be from Indonesia and executed by state and non-state, national, regional and international actors. The impact covers all aspects of social conditions consisting of ideological, political, economic, social, cultural, defense and security. Within five years, according to priority, these threats are categorized as factual and non-factual threats.

## **Factual Threat**

Factual threats are known threats that can occur at any time, they may or may not come from Indonesia. This exposes Indonesia to national sovereignty, territorial integrity and safety risks. Factual threats are priority threats in dealing with terrorism and radicalism, separatism and armed insurgency, natural disasters, border violations, piracy and theft of natural resources, epidemics, cyber attacks and espionage, as well as human trafficking and drug abuse.

## **Non-Factual Threats**

Non-factual threat is the threat of open conflict or conventional war in which the strength of the armed forces of each country conflict with each other. The UN Charter articulates that all countries in the world must commit to respecting each other's national sovereignty and interests. Because of that it is impossible to influence Indonesia now and in the future. However, as a nation of extraordinary potential, vigilance must be maintained because of dynamic threats, which have the potential to become factual, when national interests and honor are disrupted.

## **National Interest in the Maritime Sector**

In this section, the formulation of national interests will be analyzed from the viewpoint of national interests. According to the US DoD Dictionary Military Terms, national interests are defined as the basis or foundation of developing national targets that set goals and objectives. The broader understanding is that national interests are the needs and desires set by a sovereign state in dealing with other sovereign states, non-state actors, and opportunities and situations in a developing strategic environment that are displayed as targets to be achieved. This broader understanding explains the dynamics of a strategic environment in which various actors, opportunities and interactions play their role, both internal and external components 72 Journal of Defense December 2016, Volume 6, Number 3 are recognized. Interests are described as the final target or desired final condition, both in general and specifically.<sup>2</sup> Determining national interests is usually done by setting out the objectives to be achieved from the national goals that have been set, and usually also

associated with the next step based on the categorization of strategies to be used to achieve each of these national elements. Core national interests need to be determined first, then only other national interests are determined. After the various elements of the national interest are determined, the next step is to determine the intensity of each of these interests. The level of intensity shows the level of importance and priority of these interests. This determination is needed to assist us in determining the strategy taken to realize it.

### **Strengthening National Resilience**

In the face of multidimensional threats, strengthening national security is an inevitable condition. Reinforcement is a form of a response, both verbal and nonverbal (Usman, 2006: 80). Referring to the military world, of course, this response is a form of threats that occur both from within and outside that hit the Unitary State of the Republic of Indonesia. For this reason, a strengthening is needed aimed at providing information or feedback for the Indonesian people to encourage action and correction. In facing the threat of strengthening carried out here must be more emphasized on national security. According to Armawi (2018: 62), that national resilience comes from two terms, namely resilience and national. Endurance comes from the word hold, which means strong suffering, can control yourself, remain in the condition, determination and patience. The national term has the understanding of the population of a region that already has a government and shows the meaning as unity and unity in the interests of the nation that has been dominating. As a conceptual foundation strategy in order to make the blade of analysis to solve various kinds of problems of the Indonesian Nation, at least in national resilience itself is analyzed using eight astagatra approaches or aspects of national life, covering 3 natural aspects or, the nature of trigatra itself is static, while the other five aspects of life are always dynamic. Every country in the world, in maintaining its existence can run and realize its ideals and even its national goals from the country itself, which is very necessary and must have a national defense. In this context, in fact each nation in developing and realizing its different national resilience, this is adapted to philosophy, culture, and even to the history of the nation. National resilience is needed not only as a political conception but as a necessity needed to

support the success of the main tasks of government, such as the establishment of law and order, the realization of welfare and prosperity, the implementation of defense and security, the realization of legal justice and social justice, as well as the people's opportunity to actualize themselves (Wahyono, 1996).

### **Modernization of Military Strength**

Several countries in the Asia-Pacific region have modernized their defense forces supported by better economic growth. The aim is not only to be the same and achieve standardization of the alliance system, but also to anticipate uncertainty. The modernization of the weapons system and provocative placement can lead to miscalculation and misperceptions. Misjudgment of an event can create a complex and dangerous situation, especially related to the potential for ongoing conflict in the region, such as in the East and South China Seas. The modernization of military power is also influenced by the development of defense technology. Several countries in the region have taken advantage of this technology to modernize strategic and conventional weapons systems and modern integrated sensing systems. Some examples are Command, Control, Communication, Computers, Intelligence, Observation and Reconnaissance, and cyber defense systems, especially regarding cyberspace, cyber war has now become a strategy to inflict losses on a country's strategic impact.

### **Science and Technology Development**

The development of science and technology influences the shape and pattern of future wars. Although the patterns and forms of asymmetrical warfare still occur in some areas, conventional warfare technology is still developing rapidly. Future wars increasingly consider reducing the impact of damage and casualties among civilians by implementing high-accuracy weapon technology and the application of robot technology from various weapons systems to reduce the use and spread of personnel and weapons. The development of information and communication technology also created war-based networks that relied on the superiority of information, so they could be implemented in digital or virtual warfare. The impact can make the world worry about security situations such as there are no limits to cyber crime including

the use of biotechnology and genetic engineering of nanotechnology that is difficult to detect. In addition, engineering technology and developments in the world of aviation, manufacturing nuclear weapons or spacecraft rocket launchers, missiles or unmanned aerial vehicles and satellites are used for national defense. This is a defense perspective that cyberspace has become the fifth domain used as a battlefield, except land, sea, air, and space. The use of internet-based systems, equipment and platforms tends to be broader and their potential creates vulnerabilities. Mastery of technology based on awareness of national defense is the basis that supports the independence of the nation in meeting the procurement of goods and services in meeting basic human needs, energy development, management of mineral resources, industry, social and culture, and, national economy, and national defense.

## **ANALYSIS**

### **Building Indonesian Maritime Security**

To create a condition where maritime security can be realized by various parties, both government institutions and economic actors in the maritime field, a systematic effort is needed to build maritime security that can answer the challenges of the tasks formulated in the previous section. In this section, we will discuss what efforts need to be made to build a strong Indonesian maritime security. According to Alfred Thayer Mahan in his book *The Influence of Sea Power Upon History 1660-1783*, to build strong sea power, there are several conditions that will greatly affect these efforts, namely (see Figure 2): (1) geographical position or geographical location; (2) physical conformation; (3) extent of territory; (4) number of population or total population; (5) character of the people or the character of the population; and (6) character of the government or the character of the government.

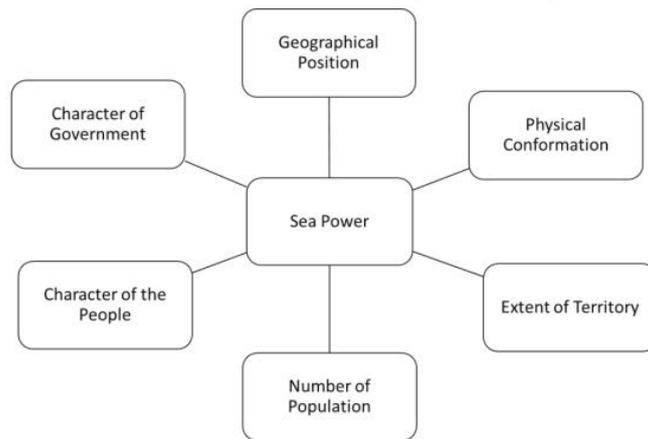


Figure 2 : Elements of Sea Power (Mahan Theory)

Sources : A. T. Mahan, *The Influence of Sea Power upon Histoty, 1660-1783*. 12<sup>th</sup> Edition, (Boston: Little, Brown, 1918, Page. 28-29

### **Enhancing Maritime Security**

The enhancement of territorial security is carried out in an integrated manner based on government policy with reference to Indonesia's geographical conditions to support Maritime Maritime policies that cover maritime territorial securities. Increased territorial security is carried out by the deployment of maritime forces that are able to reach the outer islands and effectively defend the sovereignty of the national jurisdiction of the maritime region and are directed to be able to monitor the security of the Pacific and Indian oceans. Enhancing land territorial security, land border security, and outermost small islands is carried out through the effective deployment of land force in territorial empowerment. Land strength is projected to optimize the security of the sea area as part of national defense. Improved air territorial security is done by using air power elements to support the security of Indonesia's land borders and maritime borders by increasing air surveillance and reconnaissance capabilities through a drone system capable of monitoring the security of the Pacific and Indian Oceans.

### **Relationship between Threats in the Maritime Environment and Technology and Intelligence:**

The threat to maritime security is something that is non-traditional, but that does not mean the role of the military is not important. In the report to the UN Secretary General there are phrases stating that the handling of maritime threats must be carried out together both in the form of information exchange and preventive measures in accordance with the rules of international law, in terms of inter-state coordination in overcoming maritime security issues. Maritime security is a major concern of the navy to overcome various threats of national sovereignty stemming from external factors, such as pirate problems, arms smuggling, drug problems, to illegal immigrants.

Indonesia in the Asia-Pacific region has a very dynamic security development and has an impact on security issues. The potential maritime threat for Indonesia is quite large. Maritime strength in dealing with threats in the region is not only built in terms of quantity, but also more important is quality, such as using defense intelligence technology. Defense intelligence provides an assessment of various developing issues, future strategic trends at both regional and global levels, technological developments, and the capabilities of other countries. On this basis, defense intelligence identifies possible threats to national interests in the defense sector. The capability of defense intelligence is developed to avoid the opponent's espionage and activities, to support the process and implementation of national defense policies and strategies, and to provide accurate and accurate information. Defense intelligence can provide assistance in the formulation of foreign policy, for example relating to policies on weapons of mass destruction, international control regimes on arms traffic, developments in maritime issues, international terrorism, and so on. Foreign policy in these fields must be supported by information and analysis provided by defense intelligence.

### **Application of Intelligence Operations in Indonesia to Make a Significant Contribution to Threats in the Maritime Environment:**

The first element of using force during peacetime is deterrence. Things to be

explained in the deterrence include information capability. Information capability itself is grouped in three forms, namely intelligence, observation and networking and building partnerships. Through information input from maritime intelligence operations, the Indonesian TNI can deploy strength of warship elements based on the level of vulnerability of each waters. Faced with the limited number of defense equipment owned, the waters considered to be vulnerable to threats to sovereignty and violation of the law receive priority for the deployment of force. A strong Indonesian TNI is a guarantee for the security of Indonesian waters. To anticipate various types of threats in Indonesian waters, the Indonesian TNI carries out preventive and reactive measures. Preventive steps are carried out through selected intelligence operations in synergy. On the other hand, the reactive step is carried out through routine patrol by presenting elements of the TNI in the national jurisdiction.

#### Industry 4.0 maritime

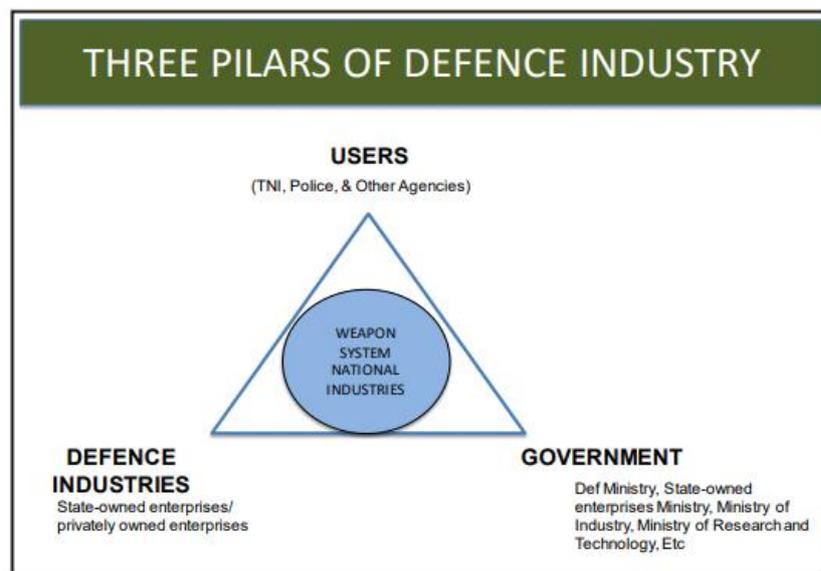


Figure 3 : Three Pillars of Defence Industry

Sources : Defence White Paper

In Industry 4.0, technology plays an important role in ensuring the maritime industry can optimize opportunities and reduce risk. Industry 4.0 illustrates how 'smart devices' will replace human roles for management, optimization, and machine control. The maritime industry underwent a dramatic change driven by a growing

pattern and an increase in the volume of trade by sea and conflicts that occurred between countries in their territorial waters such as the South China Sea conflict and maritime conflict between Singapore and Malaysia. To adapt to strategic issues, the Navy is required to implement Revolution in Military Affairs (RMA) in the development of the main weapons system (defense equipment). On the other hand, the rate of development of RMA is strongly influenced by the level of technological and management advancements achieved by other countries, so that at this time, Indonesia's dependence is very high on producing countries. Growing demands to support offshore activities such as in oil and gas exploration and production also contribute to changes in maritime maps. The progress of ship and warship technology used to protect maritime areas, especially in Indonesian waters must be considered given that they are the spearhead of sea defense in defending the territory of the Republic of Indonesia. The technology referred to may include:

1. Smart sensor
2. Network technology (IT / IoT / Comms)
3. Intelligent data analysis
4. Artificial Intelligence (AI)
5. Advanced robotics
6. Additive Manufacturing (AM)
7. Augmented reality and mix
8. Limited and fully autonomous operations

## **CONCLUSION**

The advancement of technology, information and communication brought about by globalization turns out to pose a threat to a country, not least the threat can also hit Indonesia. The Indonesian National Armed Forces as the forefront of military power possessed by the Republic of Indonesia must be able to face the dynamics of the global and regional strategic environment from the paradigm of war transformation that is happening right now through asymmetric warfare, ideological warfare, mindset warfare, and information warfare. The war did not turn out to be expensive or a lot of troops, enough to use technological advancements owned by a

country and humans who were able to control it. Even the war turned out to brainwash humans in a country, later in the future we could have Smart sensors, Network technology (IT / IoT / Comms), Intelligent data analysis, Artificial Intelligence (AI), Advanced robotics, Additive Manufacturing (AM ), Augmented reality and mix, Limited and fully autonomous operations

## REFERENCE

### Book

- Buzan, Barry. 1983. *People, States, and Fear: The National Security Problem in International Relations*. Sussex: Wheatsheaf Books.
- Carolin, Liss, Working Paper No.141, *The Privatisation of Maritime Security Maritime Security in Southeast Asia: Between a rock and a hard place*, Asia Research Centre, Australia, 2007.
- Institute of Internal Auditor (IIA), *Perspektif dan Pandangan Global Kecerdasan Buatan (Artificial Intelligence/AI) - Edisi Khusus 2019*.
- Mahan, A. T. 1918. *The Influence of Sea Power upon History, 1660-1783*. 12th Edition. Boston: Little, Brown.
- Usman, M., U., 2006. *Menjadi Guru Profesional*. Bandung: PT Remaja Rosdakarya.

### Journal

- Anwar, Syaiful. *Mastering Defence Technology By The Indonesian Human Resources In Facing The Future Warfare*. *Jurnal Pertahanan* April 2015, volume 5, nomor 1.
- Armawi, Armaidly. 2018. *Nasionalisme dalam Dinamika Ketahanan Nasional*. Yogyakarta: Gadjah Mada University Press.
- C. Bueger. 2015. "What is Maritime Security?". *Marine Policy Journal*. No. 53.
- Journal Defence*. 2016. Volume 6, No. 3
- Ministry of Defence of the Republic of Indonesia. 2015 *Defence White Paper*. Third Editions, November.

### Website

- Implementasi Industri 4.0 Terhadap Sarana Pertahanan Negara di Bidang Maritim dalam <https://nusantarapos.co.id/opini/3673/10/01/2019/implementasi-industri-4-0-terhadap-sarana-pertahanan-negara-di-bidang-maritim/>