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Technology Design 4.0 to Create Maritime Power

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Abstract
Technological developments and globalization affect the entire system of life. The state as a subject in international life must quickly follow technological developments. State Defense and Security is one of the objects that is always protected. Innovation is a verb that is always required to develop a national defense and security system. Before carrying out innovations, first look at the potential for technology-based security, such as the development of nuclear weapons, biological weapons or information and technology systems that have turned into a non-traditional war potential. Indonesia, one of the countries in the Asian region, needs to anticipate both regional and global opponents to be able to make plans and technological innovations in the future where technology is no longer a noun but a verb that plays a diplomatic role.
Keywords: Defense and Security, Technology War, Globalization 4.0, Technology and Diplomatic System, Satellite, Satellite Technology

INTRODUCTION

Globalization and technology are a unity which is called progress as well as a challenge for the whole world. that globalization is only a process of turning the world into a borderless area that can be controlled through one global power. In the existence of the State as an Actor in International Relations, the territorial area is a substance of the boundaries of the territory of state sovereignty. But to become Sovereignty there are 2 important things, namely the defense area which is part of the military and defense and also the international economy whose actors are coming from the private sector.

Actors or generations from a period of power of a regime usually have characteristics which determine the vision and mission of the leaders of their time. If it is related to the desire for state expansion, then it is no longer just about the context of "territorial extension" but the economy and culture which cannot be seen how it exists. (Armawi A. 2019) The form of domination and the desire to expand a country's territory is not only by means of traditional warfare or through violence and attacks by armed forces, but can be through non-traditional wars in the form of technological wars.

Indonesia as an island country that has vast sea areas that need to be protected, especially the territorial boundaries which are mostly located in the territorial sea which is part of the territorial area of Indonesia needs to become a concept of national defense and security. The concept of a Maritime State does not only talk about sea areas, but all defense components, namely land, sea and air. So to maximize the defense system, it is necessary to have the cooperation of all defense components. But to balance technological developments, the resources are no longer talking about Human Resources but Technology and the ability to control this technology.

Clausewel's Theory

According to Clauzewitz, war is a continuation of the political will of a country which is used as a tool to achieve certain goals, and or with the desire for territorial expansion or only causes vibration (deterrent). (J.J Widen and Angstrom, 2015).

Mahan's Theory

Mahan's view of war is the same as that of Clausewitz, who thinks that war is a continuation of policy and politics. Mahan and Corbet then linked military strategy and strategic operational issues into elements that constituted national power. More broadly Mahan connects events of naval, military, diplomatic and commercial interests on an international scale. (Hattnedorf John B, 1991)

RESULTS AND DISCUSSION

Development of World Technology

Technological developments not only bring convenience to life as a whole but also have negative effects especially on defense and security. Technological innovation is also required in the development of a military system which then has political goals. In response to this, Indonesia is trying to continue to increase the percentage of power to try to balance power both in the regional and global regions. Although this is a challenge for Indonesia where we know that the potential for regional conflict is a concern in the Asia Pacific region.

Figure 1. Indonesia's State Border

In the existence of a strategic defense environment area on a global scale, all countries are competing to advance their respective defense technologies because they realize that technology is no longer seen as an object of defense but something that can affect all defense components. In Clausewell's theory, war is part of a political game, which, when translated explicitly is related to technological advances, means that technology also has a diplomatic role. The more a country has high technology and has continuous innovations in its defense industry, both in the public and private sectors, then this becomes the face of a country. Which without doing anything, creates a deterrent effect.

In building a strong country with technological capabilities, this is directly related to the national defense budget. The following is defense spending data for Asia Pacific countries:

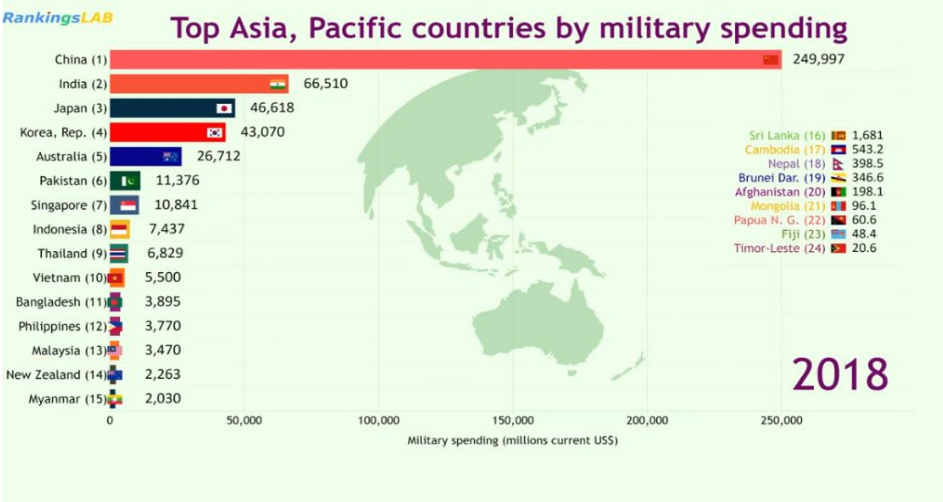

Figure 2. Defense Spending Data
Source: (Defence Study, 2019)

The allocation of these funds creates the view that countries are indeed competing to improve their defense and security. Several technological advances that are continuously being developed which pose a potential threat to countries in the regional and global regions, namely:

1. Nuclear Weapons Data

NGOs, the International Campaign for Nuclear Disarmament (ICAN) reported that spending increases in countries that continue to carry out nuclear research and development by as much as USD 1.4 billion, to USD 72 billion in 2020. Further data on nuclear weapons prepared for operations military also reported an increase, from 3,720 in 2020 to 3,825 for 2021. (Dw.com, 2021)

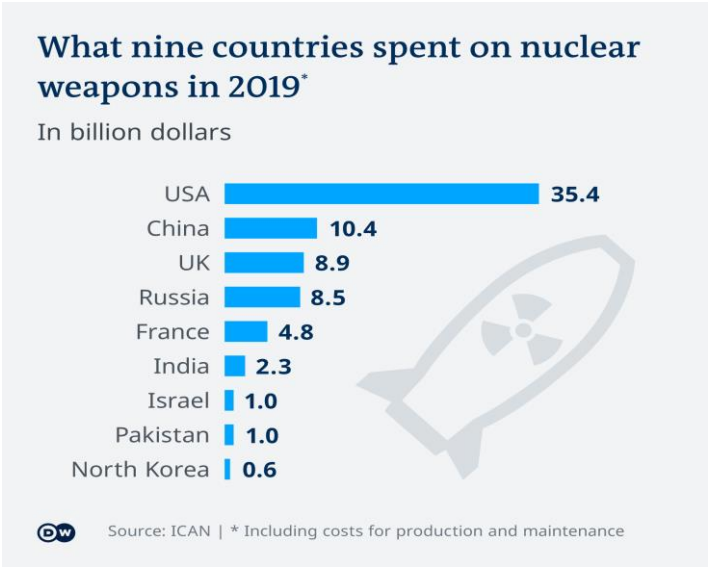

Figure 3. Nuclear Weapons Data
Source: (Dw.com, 2021)

2. Biological Weapons

Biological weapons are the utilization of natural resources to make weapons of mass destruction in the form of diseases that spread either through humans to humans or humans to animals, also through any media that allows infection and enters a person's metabolism.

The aim is to carry out attacks both personally and on a large scale to gain political or economic goals nationally and internationally. (Ministry of Defense, 2017). The advantage of biological weapons (bioweapon) is that it cannot be detected how the exact scenario of attack or deployment is. What we know is that the results of death are not small in number.

3. ICT Technology and Communication

Information and telecommunication technology is the latest technology design. Considering that technology is transformed into a new communication tool that has the speed and accuracy of sending messages. Until finally there is an ICT technology. The following are several ICT technology designs which are then carried out in structured research and development:

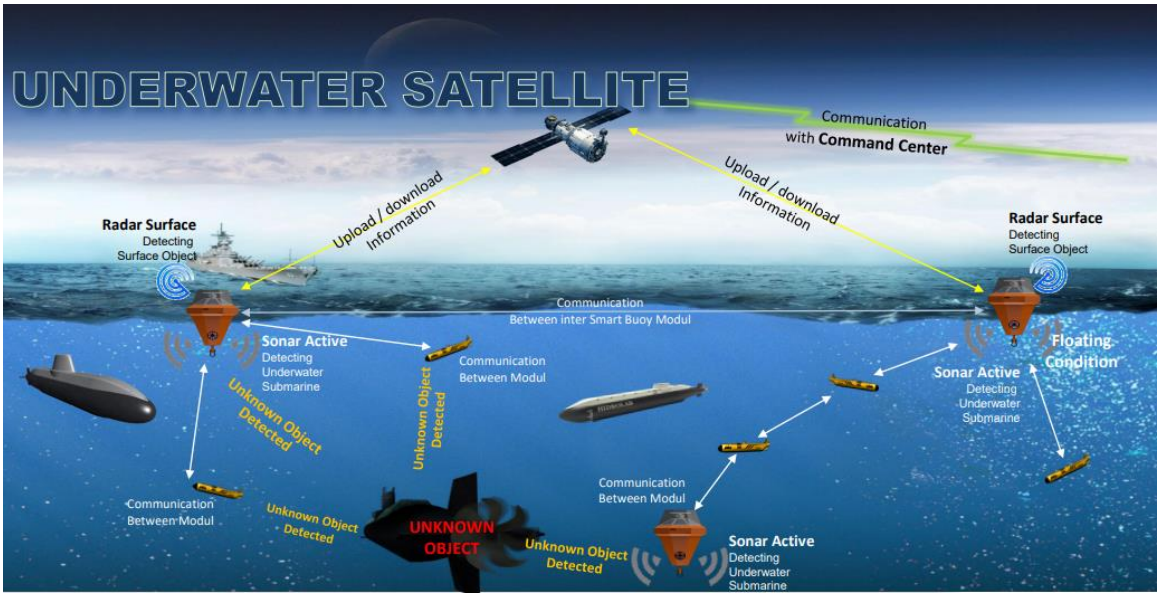

Figure 4. ICT Technology Design
Source: (PT PAL Indonesia, 2022)

The big picture of ICT technology lies in the use of satellites. Recognizing the importance of satellites that support technology and communication capabilities as well as system optimization and design of defense capabilities, the following lists the capabilities of countries and their satellite development:

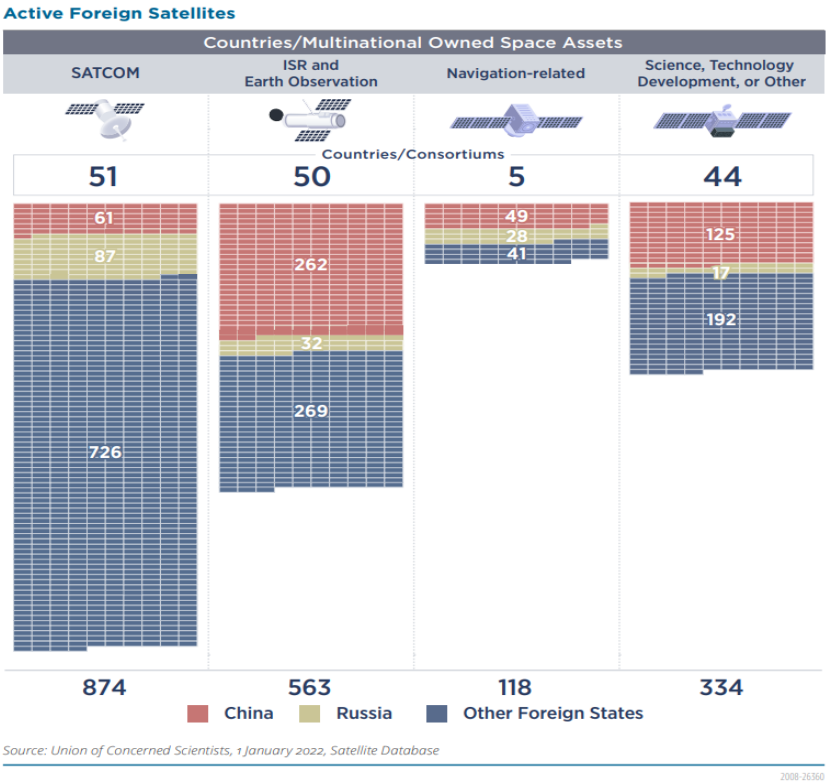

Figure 5. Satellite Development Data
Source: (Satellite Database, 2022)

From the picture, it can be seen that the dominance that has satellites is China and Russia. Others are not specifically mentioned.

Development of Indonesian Technology

Captain Alfred T. Mahan's theory says that the strength or important elements of sea power are (Anugrah PT, 2017) namely (1) Geographical position (geographical position), (2) Physical conformation (physical form), (3) Extent of territory (area size), (4) Number of population (total population), (5) National character (national character) and (6) Character of government (government character). Which was then adopted by President Jokowi by making the mission of the 7 pillars of the world's maritime axis for Indonesia which was then issued in the Presidential Regulation of the Republic of Indonesia Number 16 of 2017 concerning Indonesian Maritime Policy. The seven pillars are (1) Management of Marine Resources and Development of Human Resources, (2) Defense, Security, Law Enforcement and Safety at Sea, (3) Marine Governance and Institutions, (4) Marine Economy and Infrastructure and Increasing Welfare, (5) Marine Spatial Management and Protection of the Marine Environment, (6) Maritime Culture, (7) Maritime Diplomacy.

In maximizing the strategic design and realizing these pillars, Indonesia needs the cooperation of all government agencies to create a national defense and security design to keep abreast of world technological developments. Which is an important point and the face of Indonesia in the eyes of the international community. Specifically for technology studies, Indonesia needs a defense design, which design is always described in the Indonesian Defense White Paper (white paper). The concept of sea power is not only about building a military defense posture but also in a broad concept, namely the need for the effectiveness of all elements of defense, namely air, sea and land defense. Apart from that, other important influences which then affect the development of Indonesia's sea power are control over

commercial trade traffic both nationally and internationally, as well as the Navy's combat operations capabilities which should continue to be developed, and the use of Navy instruments in diplomacy, deterrence and political influence in peacetime.

In contrast to the concepts of land power or sea power which are highly military oriented, the concept of sea power is inseparable from geoeconomic interests. However, the aspect of sea defense power has a very important role as an instrument that guarantees the achievement of sea power and the achievement of geoeconomic interests. It should be remembered that the public sector or government matters cannot be separated from the support of the private sector. Like the concept of Indonesian technology development which is designed in such a way, it needs the support of all elements of inter-agency coordination. One form of innovation that has received results and understands the concept of innovation in Indonesia today is:

1. PT PAL Indonesia (Persero) is the hope to meet the needs of defense equipment in the marine sector such as warships, submarines and auxiliary ships. PT PAL once carried out an innovation warship with sigma class stealth technology called KRI Klewang.
2. PT DI (Persero) is a company that produces maritime reconnaissance aircraft for several countries.
3. PT Pindad (Persero) is a company that produces SS rifles as organic rifles within the TNI and Polri. PT Pindad once made a technological innovation in the form of a laser-based combat vehicle named Anoa.

The obstacle faced in building infrastructure and technology is that there is no strong coordination between institutions, even though if we list private sector and public sector companies there are still many who have not contributed consistently and shown the ability to innovate and move in the defense industry, especially renewable technologies. The ego centricity of institutions is an obstacle that cannot be easily resolved. Returning to the political factor, that political will and leadership are very influential because technology will be useless or will not develop without any use and effort to obtain functions and legal certainty such as policies made by the government.

One of the other obstacles that creates overlapping institutional authority in the case of Marine Defense and Security Monitoring is between (1) the Indonesian Navy (2) Bakamla, (3) Water and Air Police (Polairud), (4) Sea and Coast Guard Unit (KPLP) , (5) Ministry of Maritime Affairs and Fisheries (KKP), (6) Customs, and (7) Immigration. The following is the percentage data for the composition of Indonesia's maritime patrol fleet.

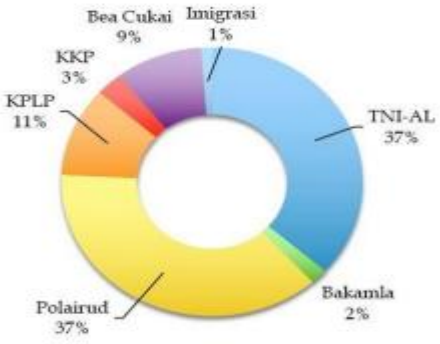

Figure 6. Patrol Fleet Composition
Source: (Bakamla, 2016)

So if we conceptualize it from the point of view of coordinating law enforcement agencies in the sea area for the sake of creating sea power, it is necessary to have a telecommunication

tool and ICT technology that has. Because if you don't have a system that is integrated with ship traffic images using the Automatic Identification System (AIS) detection below, the density of sea traffic will be very short of security resources which is the cause of how the potential for violations of maritime security is increasing.

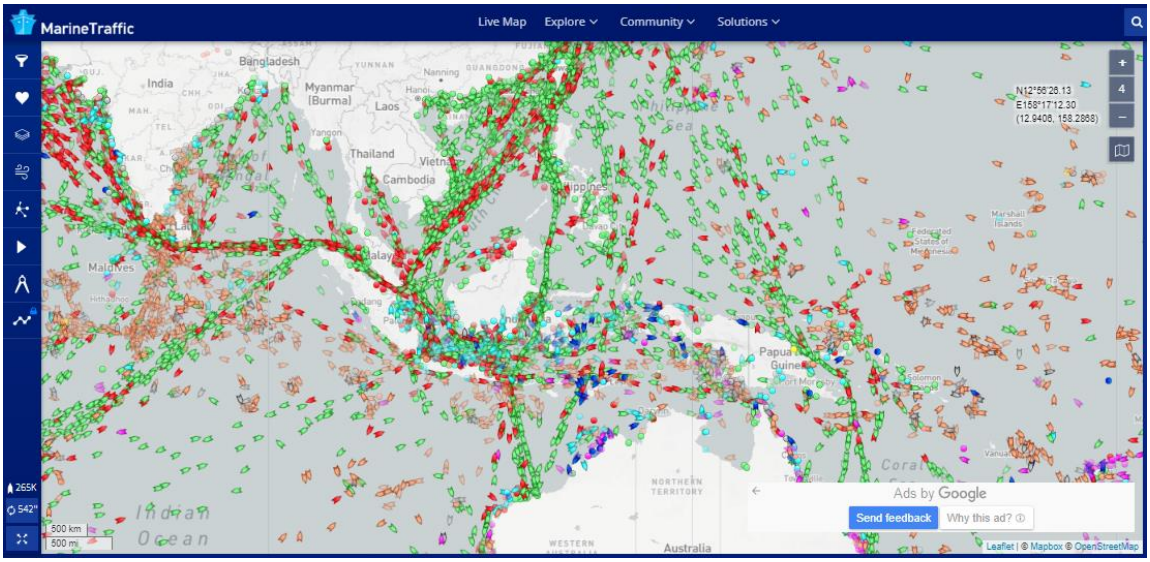

Figure 7.
Source: (Marinetraffic.com, 2022)

CONCLUSION

The regional and global environment continues to innovate and compete to maximize the defense and security budget to advance technology and innovation in all fields or elements of its defense, Indonesia, which is one of the countries that is nicknamed the world's maritime, is still far behind and still tends to face internal challenges such as egocentric institutions. and the flow of policies made. The world maritime axis plan will only be useless if it is not accompanied by an implementation plan, especially policies and institutional coordination.

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