Nat. Volatiles & Essent. Oils, 2021; 8(6): 5987-6002

NVEO
Natural Volatiles &
Essential Oils

Contemporary Geopolitical Perspective: Wawasan Nusantara From The Perspective Of Airspace Security In The Industrial Revolution Era 4.0

Lilly S. Wasitova [1*], Ricardus Eko Indrajit [2], Marsetio[3], Siswo Hadi[4], Koesnadi Kardi[5]

[1,2,3,4,5]Defense Science Researcher, Doctorate Study Program; Indonesia Defense University

E-mail: lilly.wasitova@gmail.com

Abstract

World War I has brought a new paradigm of geopolitics, geoeconomics and geostrategy in today's world and cannot be separated from the history of human civilization and the development of the world's population. In addition, technological developments marked by the Industrial Revolution also had an influence on the shift in the global socio-cultural map and also on conventional geopolitics. This has influenced the thinking of Indonesia's founding fathers and its independence from colonialism. The establishment of independent Indonesia as the "Nationale Staat" namely the State of Indonesia that unites humans and their place - the people who are inseparable from the earth at its feet stated by Proclaimer Ir. Soekarno and furthermore declared the Wawasan Nusantara as the embodiment of the basic geopolitical philosophy and insight of the Indonesian nation and as National Basic Doctrine. The Industrial Revolution was the factor that greatly influenced the development of the tools of war used in the First and Second World Wars and later resulted in the presence of Revolutionary Military Affairs (RMA) that is characterized by changes that affect the character of the conflict dramatically in a very short period of time. Thus, these changes led to extreme changes in military doctrine and the required organization, as much as the use of an airspace. The 1944 Chicago Convention provide a strong foundation for the sovereignty of a country, where each country has full and absolute sovereignty over its territory, including the air space over its territory. However, the dynamics of the development of the global and regional strategic environment as well as the rapid development of aerospace technology have led to an increasing potential threats to state sovereignty in the air. The researcher discusses the dynamic of geopolitics, geostrategy and geoeconomy that require a change of paradigm, especially in the airspace. The research is based on qualitative research methods using a historical approach with a critical paradigm for critical discourse analysis with the focus in airspace security in the conception of Wawasan Nusantara and technological developments as well as geopolitics, geostrategy and geoeconomics.

Keywords: Revolutionary Military Affairs, Territorial Sovereignty, Airspace Security, Geopolitics, Geostrategy, Geoeconomy

Introduction

After World War I the world underwent many changes politically, economically, socially, culturally, especially in Eurasia (Europe and Asia), Africa, and also in other areas involved in war. Political and social changes that occurred include the Spanish Flu, the signing of the Paris Peace Conference on January 18, 1919 at the Palace of Versailles to negotiate a peace treaty between the Allies (United Kingdom, France, and Russia) and the Central Powers (Germany, Austria-Hungary, the Ottomans, and Bulgaria) who lost the war, the Revolution of 1917–1923 which was a period of worldwide political tension and rebellion inspired by the success of the Russian Revolution and the events triggered by the aftermath of the World War I. In de-facto some old countries were abolished and new countries were formed, where the boundaries between countries were redefined.

This changing condition requires a new strategy for the countries involved in the World War I and has an impact on the development of traditional geopolitical theories with new approaches to geopolitics in relation to political power and geographical space as well as geostrategy and geoeconomics.

Figure 1: European Countries Involved in the World War I

https://pendidikan.co.id/latar-belakang-kronologi-dan-dampak-akibat-perang-dunia-1/

The development of the world's geopolitical and geostrategic approaches influenced the thinking of Indonesia's founding fathers in preparing Indonesia's independence from colonialism. This can be traced from the Minutes of the Session of the Investigating Agency for Preparation for Indonesian Independence (BPUPKI). In BPUPKI sessions, the concept of an independent Indonesian state was widely discussed and agreed upon the concept of Wawasan Nusantara (Wasantara) as the embodiment of the basic geopolitical philosophy and insight of the Indonesian nation in establishing a "Nationale Staat" namely the State of Indonesia that unites humans and their place. This is the basis for the Government of Indonesia to trigger the Djuanda Declaration on December 13th, 1957.

The experience of the First and Second World Wars shows that technological developments that were in line with the Industrial Revolution brought new developments in advanced weapons systems and weapons to strengthen weapons for each country's military. The development of the Industrial Revolution 4.0 also has a significant impact on future generations of war, especially in airspace.

Research Approach

This study uses a qualitative method using a historical approach with a critical paradigm for critical discourse analysis. The critical paradigm believes that social reality is a system that is constructed and is under a group of powerful parties and emphasizes knowledge but to explore existing ideas, not based on standard laws and procedures. The way of thinking research is carried out deductively-inductively through reviewing literature from various sources and passing through the stages of critical-scientific thinking, where the researcher begins to think deductively-inductively, namely capturing various facts or phenomena, through observations in the field then analyze them and then attempt to theorize based on the results of his observations. Collecting data using observation and document study. The focus of this research is airspace security in the conception of Wawasan Nusantara and technological developments as well as geopolitics, geostrategy and geoeconomics.

Research Result

1. Development of Geopolitical and Geostrategy Theory

The changing conditions after the World War I required a new strategy for the countries involved and had an impact on the development of traditional geopolitical theories with new approaches to geopolitics in relation to political power and geographic space and geostrategy. Geostrategy at that time was still defined as part of geopolitics for military or war purposes. Among the reformers and geopolitical experts at that time and some of their predecessors, among others [1]:

1. Frederick Ratzel (1844 – 1904) – Living Space Theory

Ratzel was a German geographer and ethnographer best known for his first use of the term Lebensraum ("living space"). Ratzel developed the Concept of Living Space Theory (Lebensraum) in 1897 which stated that the space occupied by political groups (states) developed the law of expansionism both in the areas of ideas, missions and products. Ratzel stated that the state in certain respects can be likened to an organism, namely experiencing a phase of life in a combination of two or more between birth, growth, development, peaking, subsidence and death. To prove superiority, the state must control related political units, especially those of strategic and economic value. Ratzel's view of geopolitics gives rise to two streams of power:

a. focusing on power on land (continental) and

b. focusing on power at sea (maritime).

2. Rudolf Kjellen (1864 – 1922) – Power Theory

Kjellen was a Swedish political scientist, geographer and politician who first coined the term "geopolitics" and was heavily influenced by the thinking of Friedrich Ratzel. Kjellen developed Ratzel's theory of space by assuming that the state as an organism is formulated into a political/government system through 5 areas, namely: (a) kratopolitics (government politics), (b) Eco-politics, (c) Sociopolitics, (d) Demopolitics and (e) Geopolitics. The core of Kjellen's teachings is developed in a geostrategy where each country, in addition to trying to maintain its survival, also obliges its nation to be self-sufficient in developing its national strength continuously. The impact of developing national power has two important meanings, (a) Inward: Fostering harmonious unity and unity and (b) Outward: In the expansion of the territory can obtain clear boundaries with the surrounding countries. Besides that, the state does not have to depend on external sources of supply, but must be able to be self-sufficient and take advantage of cultural and technological advances to increase national strength.

Kjellen predicts that the struggle between continental (land) powers and maritime (sea) powers will eventually be won by continental powers as well as control power at sea.

3. Karl Houshofer (1896-1946) – Ekspansionism Theory

Haushofer was a German general, professor, geographer, and politician who initiated Geopolitics with an expansionist strategy. Around 1935 [2] Karl Haushofer taught geopolitics as a doctrine of expansionism in the form of political geography which focused on issues of border strategy, the nation's living space and racial, economic and social pressures as factors that necessitated a new distribution of world wealth.

The core of Haushofer’s geopolitical understanding which is a refinement of Kjellen's theory, namely: (a) The power of the land empire will eventually dominate the ocean empire (b) There will be big countries in Europe, Asia and Africa. Haushofer’s prediction, in many ways prompted the birth of Nazi Germany under Hitler with the motto Greater Germany above all countries and in Asia the birth of Japanese chauvinism with the motto of Hako I Chiu, namely to make Japan the leader of Asia, the light of Asia and the pioneer of Asia (Three A).

Haushofer proclaimed that Geopolitical Theory is a political foundation, namely: as a state doctrine that focuses on border strategies, as a basis for political action in the struggle for survival to obtain living space (region), as a scientific basis for political action in the struggle for living space. , where the living space of the nation and the pressure of racial economic and social power necessitate a new division of the world's natural wealth. Then Haushofer identified a strong economic area or sphere of influence, which he called the pan-region (*Geopolitik der Panideen*), which became the forerunner of the geoeconomic approach.

4. Sir Halford John Mackinder (1861 – 1947) – Heartland Theory

Mackinder, a British geographer, academic and politician, considered one of the founders of geopolitics and geostrategy, was an adherent of the "concept of power". He was the one who initiated Heartland Theory as the concept of developing land power. In 1904 Mackinder presented his theory [3] which stated that "whoever can control the "heartland" (heartland), namely Europe and Asia, will be able to control the "island world" namely Europe, Asia, Africa and finally be able to dominate the world".

5. Sir Walter Raleigh (1552 – 1618)

Maritime Insights is based on the concept of power in the oceans, and was pioneered by a figure from England Sir Walter Raleigh who stated "who controls the oceans will control trade, and those who control trade will rule the world". Based on Raleigh's theory, at that time England established supremacy in the oceans and the foundation of the British Empire formed the "Life Line Of the British Empire". Raleigh was an English statesman as well as a soldier, writer, poet, explorer, and landlord. He played a major role in the British colonization of North America and several other missions.

6. Alfred Thayer Mahan (1840-1914) – Sea Power Theory

Alfred Thayer Mahan is an American maritime expert who is best known for his work “The Influence of Sea Power upon History” which is based on his research on the British maritime nation. Mahan's theory adopts Raleigh's Theory by also saying that sea power is vital for national growth, prosperity and security.

Mahan formulated six characters that are prerequisites for a potential country to develop sea power, namely [4]: 1. Geographical position, 2. The shape of the land and coast, 3. The size of the area, 4. The number of people who descend to the sea, 5. National character by its population and 6. The character of the government including National institutions.

7. William Lendrum Mitchell (1879 – 1936) – Air Power Theory

Mitchell, an American soldier who served in World War I, who later became a geopolitician formulated the "Air Power" Theory in 1922 that describes about the power in the air. He expressed a vision of strategic air power that would dominate future wars and believed that aircraft were inherently offensive and were a strategic weapon that revolutionized warfare by enabling direct strikes to "vital centers" of enemy states which are indispensable in modern warfare [5].

8. Giulio Douhet (1869 – 1930) – Air Power Theory

Douhet was an Italian general who was also an "Air Power" theorist and was a major proponent of air warfare in the 1920s by William "Billy" Mitchell and Hugh Trenchard, among others. Douhet advocated the creation of a separate Air Force commanded by pilots. In his book “The Command of the Air” (Il dominio dell'aria) written in 1921 [6], Dauhet stated that air power is revolutionary because it operates in the third dimension and the development of power in the air has a reliable defense against various threats in a fast tempo, powerful and the impact is so terrible so that there is no chance for the opponent to make a move. It is the power in the air that is most decisive in disabling five basic types of targets: industry, transport infrastructure, communications, government, and "war-willed people." The fifth goal is the principle of "Total War" which

includes any and all resources and infrastructure related to civilians, mobilizes all community resources for war, and prioritizes warfare over the needs of non-combatants.

9. John Frederick Charles Fuller (1878 – 1966) – Air Power Theory

Geopolitical Theorists William Mitchel, Giulio Dauhet, and John Frederick Charles Fuller have in common in terms of mechanization of air power and developed the theory of "Air Power" which is aerospace Insights. With the thought that in the air has a reliable defense to fend off threats and paralyze the opponent's strength.

Fuller was a senior British Army officer, military historian, and expert on war strategists and the impact of war on social, political and economic factors in the civilian sector. Fuller emphasized the potential of the new weapons (tanks and aircraft) to take the enemy by surprise psychologically. In 1926 Fuller wrote "The Foundations of the Science of War" which contained "The Nine Principles of War" involving the use of combat force which later became the basis of much modern military theory. Fuller then predicted the future of war in his book "On Future Warfare" in 1928, which turned out to be true in the Second World War. In 1942 Fuller published the book "An Inquiry into the Influence of Mechanics on the Art of War" which basically adopted the development of the Industrial Revolution in the future.

10. Nicholas J. Spykman (1893 – 1943) – Rimland Theory

Spykman is a Professor of International Relations who bases his knowledge on geography as the main capital for understanding geopolitics and geostrategy. The main point of Spykman's theory is called "Boundary Area Theory" or "Combined Insight Theory", which is a theory that combines land, sea, and air forces which in its implementation are adapted to the needs and conditions of a country. Spykman said that whoever is able to combine land, sea and air forces will control the boundaries between nations permanently and eternally. The theory of boundary areas (Rimland) is a theory of combined insight, which combines land, sea and air forces and in its implementation is adapted to the needs and conditions of a country.

Spykman can be considered a student and critic of both geostrategists Alfred Mahan and Halford Mackinder. Spykman's work is based on assumptions similar to Mackinder's, the unity of world politics and the unity of the world seas (unity of the world sea), but extends it to the unity of the air (unity of the air). Exploration of the whole world means that the foreign policy of a country will affect not only neighboring countries but will also affect the equality of Nations in all regions of the world. Maritime mobility will open up the possibility of new geopolitical structures.

Spykman adopted Mackinder's definition with some modification by changing several names: The Heartland; The Rimland (analogous to Mackinder's "inner or marginal crescent") and The Offshore Islands & Continents (analogous to Mackinder's "outer or insular crescent").

11. Edward Nicolae Luttwak – Geoeconomy

Luttwalk was born in Rumania on November 4th, 1942 and is an American economist and consultant who is also a strategist and historian best known for his work on grand strategy, geoeconomics, military history, and international relations. He is best known as the author of “Coup d'État: A Practical Handbook” (1968). Luttwalk initiated Geoeconomics as a branch of Geopolitics that focuses on the study of space, time, and political aspects of economics and resources, in addition to Pascal Lorot, a French economist and political scientist.

In the late 1980s, at the end of the Cold War, Richard Nixon had predicted that geoeconomic considerations would eventually take precedence over classical geopolitics among US policymakers. This period is a period where economic power plays a rapidly growing role in geopolitical analysis, it can even be said that

geoeconomics has been equivalent to geopolitics as an analytical instrument. The most important thing is that at that time the Industrial Revolution 4.0 began to become global.

2. Wawasan Nusantara as the geopolitics of the Indonesian Nation

Wawasan Nusantara is an Indonesian geopolitical conception that refers more to Haushofer's geopolitical theory which basically refers to the synthesis of history, economics, politics and physics with the application of spatial and territorial perspectives [7]. Karl Haushofer teaches geopolitics as a teaching of expansionism in the form of political geography which focuses on issues of border strategy, the nation's living space and racial, economic and social pressures.

The Wawasan Nusantara (Wasantara) is the embodiment of the basic geopolitical philosophy and insight of the Indonesian nation in establishing the "Nationale Staat" namely the State of Indonesia that unites humans and their place - the people who are inseparable from the earth at its feet, as stated by Proclaimer Ir. Soekarno at the BPUPKI Session on June 1, 1945: "...According to geopolitics, Indonesia is our homeland. A unanimous Indonesia, not Java alone, not Sumatra alone, or Borneo alone, or Selebes only, or Ambon only, or Maluku only, but all the islands appointed by Allah SWT to become one unity between two continents and two oceans, that is our homeland!" [8, p97]. on the unity of the earth of Indonesia from the tip of Sumatra to Irian"; [8, p98].

The national insight referred to contains three main ideas, namely: a sense of nationality, nationalism and national spirit, which are fully integrated and crystallized in Pancasila and Wasantara [8, p15]. This is very important to understand and use as a basis because it is the soul of the Indonesian nation in achieving the ideals of the proclamation of independence, as mandated in the Preamble to the 1945 Constitution of the Republic of Indonesia (UUD NRI 1945), namely the realization of the ideals of the proclamation of independence of the Indonesian nation, namely the realization of an independent, united, sovereign, in justice and prosperous nation.

With the concept of the Wawasan Nusantara, the territorial unity as a forum for the State of Indonesia with the geographical form as an archipelagic country consisting of (thousands of) islands has its own characteristics and features, no longer in accordance with the 1939 Ordinance. The determination of the boundaries of the territorial sea as stated in " Territoriale Zee en Maritieme Kringen Ordonantie 1939" (TZMKO 1939) Staatblaad 1939 No. 442 article 1 paragraph (1) which divides the Indonesian land area into separate parts from its territory and does not describe the territorial integrity. In order to ensure territorial integrity and to protect the wealth of the Indonesian State, all the islands and the seas located between them must be considered as a unified whole. In the Cabinet Session of Work on December 13, 1957, Prime Minister Djuanda declared a Declaration regarding the Republic of Indonesia based on the "Archipelagic State Principle" and stated that the Indonesian seas included the seas around, between, and within the Indonesian archipelago to become one unitary territory of Indonesia. known as the "Djuanda Declaration" [9]. Determination of the boundaries of the territorial sea, the width of which is 12 miles measured from the line connecting the outermost points of the islands of the State of Indonesia. This declaration became the starting point for the realization of the Unitary State of the Republic of Indonesia (NKRI).

The declaration was then presented at a session at the United National Convention on the Law of the Sea (UNCLOS) - the United Nations Convention on the Law of the Sea I on February 24 to April 27, 1958 in Geneva, but the session did not recognize and have not accepted the concept of the declaration. Finally, at UNCLOS I in 1958, Indonesia withdrew its proposal regarding the principle of an archipelagic state because the opposition was too strong. Then at UNCLOS II from 17 to 26 April 1960, Indonesia had prepared the concept of an Archipelagic State by already having a Government Regulation in Lieu of Law Number 4 of 1960 concerning Indonesian Waters. However, UNCLOS II did not result in an international agreement. It was only

at UNCLOS at the third UNCLOS in Montego Bay (Jamaica) on December 10, 1982 that it was agreed that Indonesia is an archipelagic state and the territorial sea area of Indonesia is 12 NM measured from 183 border points and also the distance for calculating the sea area of the Exclusive Economic Zone (EEZ) as far as 200 NM. Article 49 of the 1982 UNCLOS states that the sovereignty of an archipelagic state includes the waters enclosed by the baseline as well as the airspace above it and the seabed and land below it. This was later ratified by the Government of Indonesia on October 19, 1983 through Law Number 5 of 1983 concerning the EEZ and through Law Number 17 of 1985 concerning the Indonesian Border Area.

According to Lemhannas RI, the standard definition of Wawasan Nusantara is: "The perspective of the Indonesian nation, which is imbued with the values of Pancasila and based on the 1945 Constitution and pays attention to the history and culture of oneself and the environment of its existence which is sarwanusantara in utilizing conditions and geographical constellations, by creating responsibility, motivation, and stimulation for the entire Indonesian nation, which prioritizes the unity and integrity of the nation and territorial integrity in the implementation of social, national and state life to achieve notional goals." [10, p161]

The position of the Wawasan Nusantara for the Indonesian people is declared as the National Basic Doctrine in the administration of the state, to encourage, stimulate (drive), and guide state administrators and civil society to interact, in an effort to realize the national ideals of the Indonesian nation. [10, p172]. The unified and sovereign Indonesian nation is the foundation of the Unitary State of the Republic of Indonesia which has a complete and comprehensive territorial unit as a living space for the entire nation and Indonesia which has a government capable of protecting the entire Indonesian nation and all of Indonesia's bloodshed. In general, there are 4 main foundations of insight into the archipelago for the life of the nation and state, namely:

1. As a conception of national resilience, which means that the insight of the archipelago is the basis for the development of a national security strategy which includes politics, economic, food, social and culture and territorial resilience.
2. As a development insight, which means the archipelago insight becomes a guideline for national development planning covering political, economic, social, cultural, and defense units.
3. As an insight into national defense and security, which means that insight into the archipelago becomes the basis for planning national defense and security, geopolitics and geostrategy as well as regional geoeconomics, as well as other defense and security efforts. Here, Indonesia is considered as a territorial unit in which there are elements of power that can protect the country.
4. As a territorial insight, which means that the archipelago insight is the basis for a comprehensive understanding of the region as an Archipelagic State of Indonesia, which is a unitary land, sea and air territory to determine state boundaries to reduce disputes within the Indonesian border areas. At this point, in order to have the territory that is completely intact, it still leaves the determination of airspace, including space as a unitary territory of the Unitary State of the Republic of Indonesia.

3. Industrial Revolution 4.0

The era of the Industrial Revolution 4.0 (RI 4.0) began in the early 1980s in Germany with the concept of a "smart factory" based on cyber-physical systems, internet for everything, cloud computing and cognitive computing. In general, the Industrial Revolution was also a factor that greatly influenced the development of the tools of war used in the First and Second World Wars, as can be seen in the following figure:

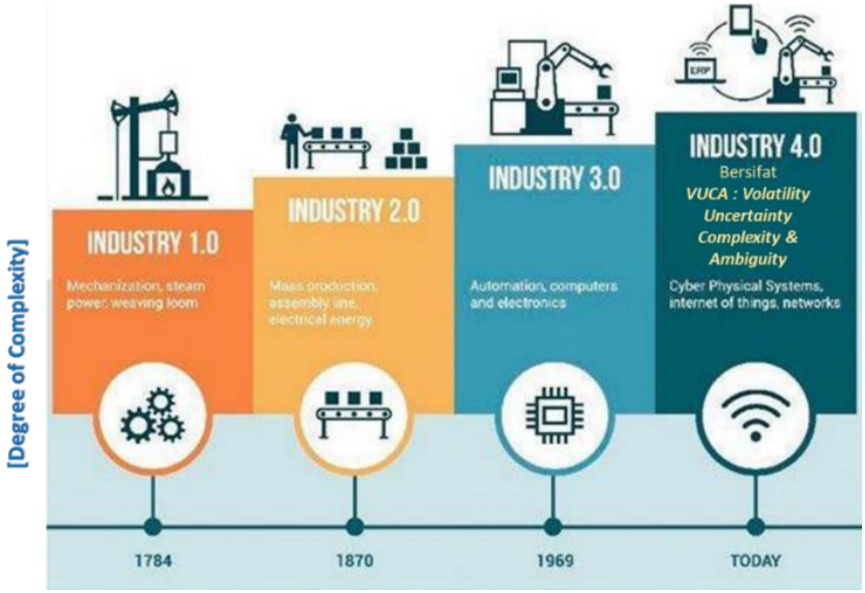

Figure 2: The Industrial Revolution and the Level of Complexity

What happened in RI 4.0 was a System Evolution with the use of Cyber physical systems, Internet of Things (IoT), Cloud Computing & Cognitive Computing, where the emphasis was on evolving integrated systems, not on certain products or services.

An integrated system means a combination of communication, IT, data and other physical elements that integrate core technologies, such as sensor networks (receptors), Internet communication infrastructure (IP), Intelligent real-time processing and event management (CPUs), activity actors mechanics, integrated "logic" software, Big Data and Data Provisioning, Operational automation and system governance/activities, Advanced robotics and 3D/4D Printing.

The characteristics of RI 4.0 is described as VUCA – Volatility, Uncertainty, Complexity, and Ambiguity – that requires transformational-based leadership [11] who must have a global understanding and have a clear perspective to be able to keep up with the speed and dynamics of changes also with VUCA – Vision (vision), Understanding (understanding), Clarity (clarity), and Agility (agility). The characteristics of RI 4.0 are as follows:

1. Horizontal integration through global value chain networks real-time optimized networks that enable integrated transparency, offer a high degree of flexibility to respond more quickly to problems and errors, and facilitate global optimization.
2. Vertical integration and network manufacturing systems use cyber-physical production systems (CPPSs) to enable factories to react quickly to changes in demand or supply levels and errors.
3. Complete integration of end-to-end engineering throughout the value chain development and manufacture of new products and production systems are integrated and coordinated with the product life cycle, enabling new synergies to be created between product development and production systems.
4. Acceleration through exponential technology Industry 4.0 requires automation solutions to be highly cognitive and highly autonomous. Artificial intelligence (AI), advanced robotics and sensor technologies have the potential to increase autonomy even further and to accelerate individualization and flexibility. AI is a computer system capable of performing tasks that

normally require human intelligence. This technology can make decisions by analyzing and using the data available in the system.

The quantum leap in technology through the Industrial Revolution was at the heart of the strategy of minimizing casualties and improving the efficiency of war. Recovery, restructuring and intensification of national power through efforts to improve technology and warfare strategies to deal with uncertain and full of uncertainties (VUCA). The tendency of various forms of arms race among the superpowers in the development of weapons of mass destruction (WMD - Weapon Mass Destruction) as a very powerful deterrence force.

In line with the early development of the Industrial Revolution 4.0, according to M. Luthfi technological advances resulted in the Revolution of Military Affairs (RMA), which can be grouped into 5 waves, as shown in the following table [12]:

	1980's	1990-94	1995-2000	2001-2005	2005- xxx
Wave	Intellectual Discovery	Early Adaptation in the West	RMA 'Technophilia'	Shift to Defense Transformation	Second & Third Thoughts
Concept	Soviet Military-Technical Revolution	Military Revolutions vs. RMAs	Revolution in Military Affairs	Defense Transformation	Modernization "Plus"
Focus	Technological paradigm shift; Soviet doctrinal innovation ;	RMAs in history; Sources of mil. Innovation;	System of Systems; Network Centric Warfare	Effects-Based Operations; Network-Centric Warfare	From RMA paradigm shift to a "shift in emphasis"

Table 1: Michael Raska's Five RMA "Waves"

The presence of RMA is characterized by changes that affect the character of the conflict dramatically in a very short period of time. These changes led to extreme changes in military doctrine and the required organization. To assess RMA can be done in two approaches:

1. System approach (System of the systems approach). The systemic approach emphasizes the use of technology and views RMA as a result of the integration of Precision Strike (accurate attacks), Information Warfare (information warfare), Dominating Maneuvers (freedom to maneuver) and Space Warfare (space warfare), which depend on technology support (satellite, NCW, reliable weapon systems such as stealth aircraft & submarines and intelligent missiles). In Figure 3 below, it can be seen that the development of NCW is in line with the development of the Industrial Revolution.
2. Three-component approach, namely technology, doctrine and organization (Triad of Technology, Doctrine and Organization). The three-component approach emphasizes the effects of changing strategic environments that cause technology to become very important in military relations/behavior and demands changes in military doctrine and organizational structures.

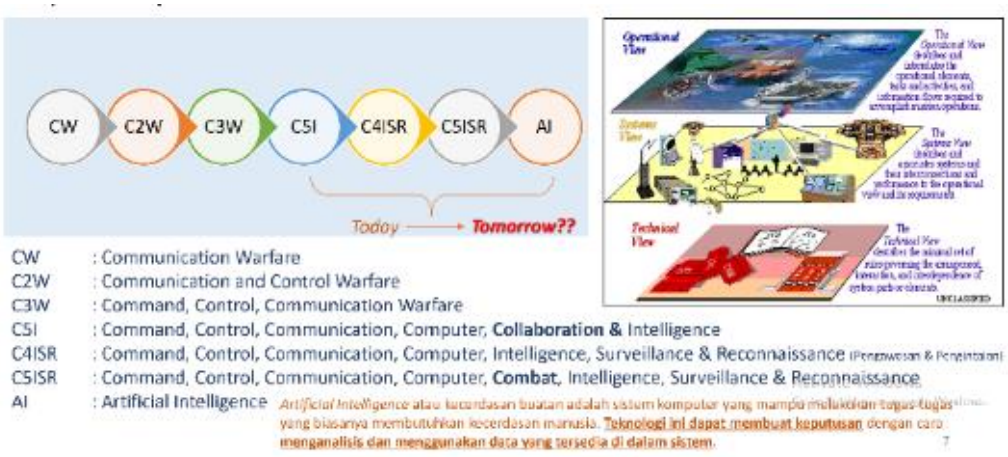

Figure 3: Development of Network Centric Warfare (NCW),

4. Indonesian Airspace

The airspace of the Republic of Indonesia follows the provisions of sovereignty as the highest power that is not under other powers and is limited by state boundaries. Based on international law, Article 1 of the Paris Convention 1919 states that every country has full and complete sovereignty over the airspace above it. Each country agreed to accept the theory of state sovereignty over airspace, namely *usque ad coelum*. This theory recognizes that the air space of each country is unlimited in altitude. This basis is then used for air navigation settings. This was later strengthened by the 1944 Chicago Convention which emphasized that the state had full and exclusive sovereignty over its air space. Referring to the two conventions, the sovereignty of the state in the air space is much greater than the sea area. There is no right of innocent passage for foreign aircraft in airspace.

Air space has a status analogous to the sea, namely the territorial sovereignty of the state over the air space above it with a certain height and then a freedom regime such as state sovereignty over territorial seas is followed by a freedom regime on the high seas. At the meeting of the International Civil Aviation Organization (ICAO) in Hong Kong on 30 July to 3 August 2018, it was shown that the sea and air territories are very closely related and there are international regulatory links between the two. The main aspects of the linkage between UNCLOS and the Convention on International Civil Aviation ('Chicago Convention' or 'CC') include [13]:

- UNCLOS defines sovereign and international airspace space (where States can make laws and where States cannot make universal laws*). It should be noted that the terms 'national airspace' and 'international airspace' are descriptive, but do not appear in UNCLOS or CC.

**Note: however, States may apply laws to their own nationals and aircraft registered in that State for operations in international airspace.*

- Airspace space depends on the definition of 'baseline' in UNCLOS, which is generally based on the coastline of the sea, whether the coast is continental or the outermost part of the island chain (archipelago). However, not all island groups are archipelagos, as the distance between islands is not more than 100NM to meet the definition of an archipelagic state (except for 3%, 125NM apart).

In the SESKOAU National Seminar on 22 April 2021 [14], KASAU provided an overview of the NKRI Air Sovereignty Area and Space as an Area of Interest in relation to the Sea Area in accordance with UNCLOS (Figure 4).

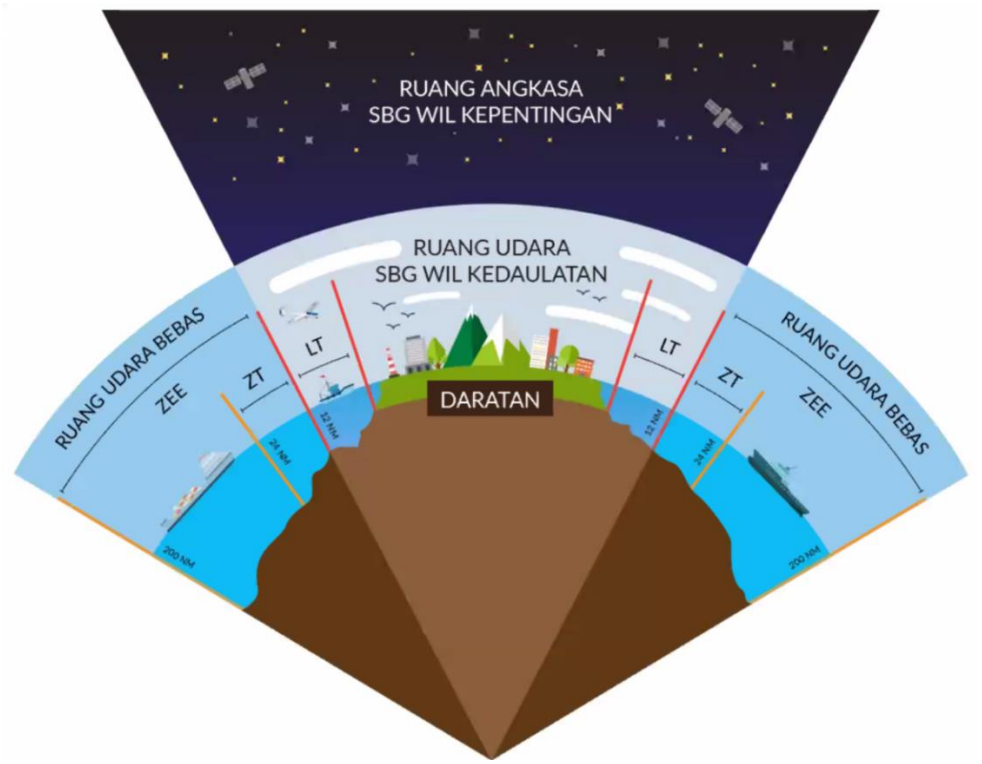

Figure 4: Definition of Airspace and Area of Interest

Air space is space located above land space or ocean space around the territory of the state and attached to the earth in the territory of a sovereign state and has the right to exercise sovereignty, sovereign rights and jurisdiction. Figure 4 illustrates that the air space of the Republic of Indonesia is in the form of a cone, a three-dimensional geometric shape that tapers smoothly from a flat base to a point called the peak, where the peak is the earth's core. The horizontal boundary of this air space is above the land area and the sea area based on the 1982 UNCLOS provisions. Meanwhile, the vertical limit of Indonesian air space is up to a height of 110 km from the configuration of the surface height of the Indonesian state, as stated in the Law of the Republic of Indonesia Number 23 of 2013 concerning Space. Above 110 km is already a space/space area and is an area of interest. In addition, at an altitude of 110 km is the limit of the functioning of the aerodynamic surface. According to Prof. DR. Priyatna Abdurrasyid the territory of the Unitary State of the Republic of Indonesia consists of one third of land, two thirds of water and three thirds of air. With a composition like this, attention to airspace as a sovereign territory of the state deserves proportional priority.

Air space and airspace as a sovereign area, have a strategic function as a valuable national asset, not only for the interests of the military and state security, but also for various interests related to politics, economy, social and others, both public and private. military. Matters that have direct or indirect dependence on air space and the resources contained therein for the benefit of human life, including: high-rise buildings, flyovers, electricity transmission networks, telecommunications networks and towers, frequencies, flight paths, mapping air, sports and aerospace tourism, development of science and technology, empowerment of wind energy, periodic paths of bird migration between regions or continents, and others. In general, the benefits of air space can be divided into 3 categories:

1. Means for Aviation and Aerospace Potential

2. Means for Satellite and Space Infrastructure (surveillance and others)

3. Means for Transmission, Telecommunications, Information and Cyber

The history of aviation and the potential of aerospace in airspace in the early 19th century was to support logistics and mail delivery. The outbreak of the World War I shifted the functions of aircraft and aviation to carry out reconnaissance missions, take Aerial Photography to create maps, as the main support for ground artillery with the aid of aerial fire, provide air cover, conduct air-to-air combat and strategic and tactical bombing and as a propaganda tool.

This was possible because at that time the Industrial Revolution had entered the established stage of RI 2.0, where mechanization and semi-automation for mass production had already begun to be established, electronics had entered the stage of applied technology innovations and entered the early stages of mechatronic development and innovation. The special need to support armaments has accelerated the maturity of aviation technology and its support. This can be proven by the rapid growth of the aircraft population at that time, as shown in the following table:

Country	Number of Aircraft until 1914	Number of Aircraft between 1914-1918
FRANCE	140	13,000
ENGLAND	230	22,650
RUSSIA	250	5,000
GERMANY	500	14,356
AUSTRIA - HUNGARY	40	5,200

Table 2: Aircraft population during the World War I,

Satellite and Space Science has been started since 1910, in line with the development of aerospace science. In 1961 the first manned space mission was successfully carried out by both Russia and the United States, in the corridor of the cold war between the two.

Nowadays satellites are made more focused on conducting scientific research, measuring the earth's gravity, monitoring volcanoes, monitoring the weather, military needs, navigation, Earth imaging, communications and others [15]. Space science is developing rapidly also in line with the development of the aerospace world, where many things that used to be limitations can be solved by the development of digital technology through the Industrial Revolution 4.0. Knowledge of space also allows the classification of space use for certain missions supported by satellites, of course with optimization and efficiency of time and cost. Satellites are basically divided into 3 (three) types according to the location of their orbits, namely: LEO (Low Earth Orbit) Satellites, MEO Satellites (Medium Earth Orbit) and GEO Satellites (Geostationary Earth Orbit).

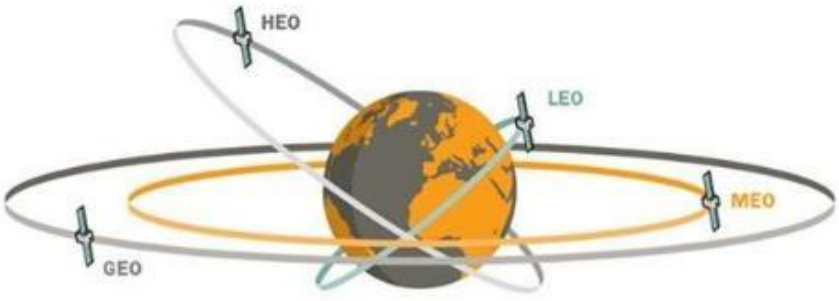

Figure 5: Orbital LEO, MEO, GEO and HEO

Height	Speed	Orbital	Examples
500 km - 2.000 km	27.000 km/h	LEO	Satellites for dynamic telecommunication system, e.g. Iridium Satellite and Global Star
2.000 km - 35.768 km	19.000 km/h	MEO	Survailance Satelites (image processing, waether etc), US GPS Satellite at 20.000 km and Russians GLONASS (Global Navigation Satellite System) at 19.000 km
35.768 km	3 km/s	GEO or HEO	Palapa Satellite, Telkom Satellite, Garuda Satellite, Nusantara 1 Satellite

Table 3: Usage of LEO, MEO, GEO and HEO Satelites

5. Airspace Security

Airspace security is very important in the future development of Geopolitics, Geostrategy and Geoeconomics, learning from the history of wars that have occurred to date. Dr. Agus Setiadji in his book [16] describes the Six Generations of War, each of which has its own characteristics, namely:

1. Generation of War I (1648-1860) with the characteristics of Massed Manpower, Battle of attrition. It was a face-to-face war, as in the English Civil War (1642-1651) and the Napoleonic Wars (1803-1815).
2. Generation of War II (1861-1918) with the characteristics of Massed Firepower with permanent fort protection capabilities, such as in the American Civil War (1861-1865) and World War I (1914-1918).
3. Generation of War III (1939-1975) with the characteristics of Maneuver Warfare & Blitzkrieg. Territory space was replaced by time and speed (lightning attack) maneuvers using tanks & aircraft as in World War II (1939-1945) and Vietnam War (1955-1975)
4. Generation of War IV (2001-2019) with prolonged characteristics of Rebellion, Terrorism and VNSA (Violent Non State Actor). There is confusion between the lines of war and politics, between combatants (military) and civilians, such as ISIS terrorism in Syria and Iraq.
5. Generation V War (2009-present) with Non-Contact characteristics, such as Cyber Warfare, OSMDW (One-Shot Mine Disposal Weapon with UAV, AUV, USV) & Precision Guided Missile, namely War with computer equipment and networks via cyberspace (cyberspace) both in offense or defense, C4ISR, military and non-military targets (War of Stuxnet, Operation Aurora). The outbreak of the COVID-19 pandemic at the end of 2019 is a form of war against threats that initially were potential threats to become real threats, especially to public health and the economy, and are also a separate threat to the aviation sector and the defense economy in particular. According to Cirium, a travel analytics and data company, the impact of the CoVID-19 pandemic on the aviation sector has pushed global air traffic growth back to 1999."
6. Generation VI War (Space and Time Manipulation) in the form of Network Centric Warfare & Cyber War and Space War.

The characteristics of Generation IV War and Generation War V are no longer based on the threat of conventional physical war that relies on weapons and is "hard power" for territorial control, but also "soft

power" by changing mindsets, ways of life, perspectives, and ideologies. a combination of political, military, social, economic and cultural means whose main purpose is to control the territory of the state and discourage other parties.

To carry out airspace security, it is necessary to first understand the development of threats or potential threats after the World War II (Generation of War IV and beyond), including:

1. Military threats of modern warfare, which include information warfare, space warfare, cyber warfare and NBC (Nuclear, Biological and Chemical).
2. Non-Military Threats are threats to ideology, politics, economy, social, culture and security, the impact of which can have implications for national stability. The Covid-10 pandemi is considered as a non-military threats from the public-health and economical point of view.
3. Hybrid threats, namely threats that are an integration between military and non-military threats. Hybrid threats include a combination of conventional, asymmetric, terrorist and cyber warfare, NBC (Nuclear, Biological and Chemical), and criminal threats that are diverse and dynamic.
4. Threat of Terrorism, Terrorism is an act that uses violence or threats of violence that creates an atmosphere of terror or widespread fear, which can cause mass casualties, and/or cause damage or destruction to strategic vital objects, the environment, public facilities. , or international facilities with ideological, political, or security disturbance motives [17].
5. Ideological threats, efforts made to undermine the ideology of the state that will threaten the basis/philosophy of the State.
6. Socio-cultural threats in the form of issues of poverty, ignorance, backwardness, and injustice which are the basis for the emergence of vertical conflicts between the central and regional governments, and horizontal conflicts, namely ethnicity, religion, race, and inter-group (SARA) are the toughest enemies today. .
7. Threat of explosive world population growth, which will have an impact on increasing energy and food needs with the same availability of land. This is the biggest threat to the environment, energy and natural resources, land and other resources for survival. Prediction of population development that grows faster than the ability of the earth and the environment to improve existing resources so that in the end the ability of the earth will be exceeded and impact on the quality of human life.

Modern war military and non-military threats require reliable deterrence and a capable airspace and airspace security force. Territorial boundaries become very important and clear demarcation is needed with the help of appropriate technology. Mastery of technology and utilization of Aviation and Aerospace Potential, Satellite and Space Infrastructure as well as Transmission, Telecommunication, Information and Cyber Means is a must. Human resources are key in preparing for airspace security.

Conclusion

Based on the discussion above, it can be concluded that the theories of Geopolitics, Geostrategy and Geoeconomics evolve according to their time, and can be clarified in Generations of War which have different characteristics. One of the triggers for this evolution is the interest of the parties in expanding their territory and/or maintaining their hegemony, either through war or other means.

Preparations for Indonesian independence have proven to follow the dynamics of geopolitical developments after the World War I. The conception of the Wawasan Nusantara and the Basic State resulting from the BPUPKI Session has provided a solid foundation as a Nation-State, which has its own characteristics. The

Wawasan Nusantara then became a strong basis for declaring Indonesia as an Archipelago State through the Djuanda Declaration, which was later strengthened by the 1982 UNCLOS decision.

The concept of Wawasan Nusantara is a perspective and arrangement that covers the entire life of the nation in Astagatra, which consists of a natural aspect (Trigatra) and a social aspect (Pancagatra) which is the basis of the IPOLEKSOSBUDHANKAM policy which is actually in line with the conception of the universal people's defense and security system (SISHANKAMRATA).

The dynamics of the development of Geopolitics and Geostrategy in the 21st century, in line with the Industrial Revolution 4.0 and technological developments require a change in paradigm and geopolitical and geostrategic insights by not leaving the foundation of Indonesia's independence, namely the National Insight. The National Insight contains three main things: a sense of nationality, nationalism and the spirit of nationalism, which are fully integrated and crystallized in Pancasila and the Wawasan Nusantara.

Threats and Potential Threats for Generation IV War and beyond need serious attention, especially due to the increasingly blurred boundaries between war and political lines, between combatants (military) and civilians, as well as the increasing threat of non-military in all its forms. This requires a mature conception in the face of Total War, namely the conception of a capable universal people's defense and security system (SISHANKAMRATA).

One of the logical consequences of RI 4.0 is the development of the RMA conception which shows the tendency to develop cyber and air power (aerospace and space) for defense equipment and fall into the category of Generations of War IV and beyond. The need for Indonesia to maximize the use and defense of air space for all its categories, namely as a Vehicle for Aviation and Aerospace Potential, Vehicle for Satellite and Space Infrastructure, Vehicle for Transmission, Telecommunication, Information and Cyber.

Geoeconomics that emerged after World War II and post-Cold War became a new parameter alongside Geopolitics and Geostrategy in the dynamics of the 21st century. Geoeconomic control will be very important for Indonesia due to the shift in the Center of Gravity (CoG) geo-economics and geo-politics in the world from Atlantic/West towards Pacific/East which is influenced by the transformation of world economic power in the 21st century by Asian countries whose average economic growth is 7% per year and 40% of world trade is in this region [18].

Recommendation

From the conclusions of this study and research findings, several recommendations for further research related to:

1. Strengthening Archipelagic Insights by determining the airspace as a unitary territory of the Unitary State of the Republic of Indonesia as the basis for a comprehensive understanding of the Indonesian territory which is an Archipelagic State (Archipelagic State) as a unitary land, sea and air territory.
2. Strengthen and actualize the concept of Wawasan Nusantara towards the dynamics of global change, especially focusing on the trilogy of Geopolitics, Geostrategy and Geoeconomics in the form of a constitutional basis.
3. A thorough study of the characteristics of Generation IV War and beyond, in line with technological developments and the Industrial Revolution as well as the forms of Threats or Potential Threats that must be anticipated.

4. A holistic study of the dynamic development of the international, regional and national strategic environment for the next 10-20 years, accompanied by comprehensive preventive measures, if necessary.
5. Prepare the NKRI roadmap to anticipate, deal with, and ward off all possibilities that exist from threats and/or potential threats in the future, through innovations in technology solutions based on archipelagic countries.
6. Preparation of appropriate and qualified Human Resources to be able to provide new innovations in line with the Industrial revolution in strengthening defense equipment and security systems.
7. The steps needed to form and strengthen aerospace personnel who have a national perspective.

REFERENCES

1. Geopolitik Indonesia, Program Studi Pendidikan Kerwarganegaraan – Hibah Pembelajaran Non Konvensional, Universitas Ahmad Dahlan, 2021
2. https://en.wikipedia.org/wiki/Karl_Haushofer
3. Pascal Venier, The Geographical Pivot of History and Early Twentieth Century Geopolitical Culture, European Studies Research Institute, University of Salford, Manchester M5 4WT, 2004, The Geographical Journal, Vol. 170, No. 4, December 2004, pp. 330–336
4. Lillyana Mulya, Postur Maritim Indonesia: Pengukuran Melalui Teori Mahan, Alumna Program Studi S2 Ilmu Sejarah Universitas Gadjah Mada, Jurnal Lembaran Sejarah, Vol. 10, No. 2, Oktober 2013
5. https://web.archive.org/web/20080924000311/http://www.airpower.maxwell.af.mil/airchronicles/cc/mitch.html
6. Giulio Douhet, The Command of The Air, Air Force History And Museums Program, Washington, D.C., 1998
7. Bertil Haggman, Geopolitics, The United States, The Eurasian Transcontinental Bloc, And China, 1999 https://web.archive.org/web/19991004204648/http://www.algonet.se/~jman/bertil/geous.html,
8. Risalah Sidang BPUPKI - PPKI, 28 Mei 1945 - 22 Agustus 1945; Sekretariat negara RI, Jakarta, 1998
9. Arini Tathagati, Lilly S. Wasitova Cara Mariko Saswinadi Sasmojo; Deklarasi Djuanda – Makna dan Implikasinya dalam Berteknologi dan Berindustri; ISBN 978-602-50344-3-5, 2020
10. Wawasan Nusantara, Tim Pokja Wawasan Nusantara Lembaga Ketahanan Nasional Republik Indonesia, 2021, ISBN 978-602-14873-5-8
11. Bob Johansen, Leaders Make the Future - Ten New Leadership Skills for an Uncertain World, 2012
12. R. Mokhamad Luthfi, Implementasi Revolution in Military Affairs (RMA) Dalam Kebijakan Pertahanan Indonesia, Thesis Fakultas Ilmu Sosial dan Ilmu Politik Universitas Indonesia, 2012
13. International Airspace and Civil/Military Cooperation, The Sixth Meeting Of The Atm Sub-Group of Apanpirg (ATM/SG/6), Hong Kong, 30 July – 03 August 2018, published by the ICAO Asia and Pacific Office, Bangkok
14. Marsekal TNI Fadjar Prasetyo, Kepala Staf Angkatan Udara (KASAU), Keynote Speech KASAU, Seminar Nasional SESKOAU, Lembang, 22 April 2021
15. Vey Kresnawati, Ketinggian Satelit Saat Mengorbit Bumi, 22 Februari 2019, https://opini.id/sosial/read-9720/ketinggian-satelit-saat-mengorbit-bumi-
16. Laksdya TNI (Purn) Dr. Agus Setiadji, Ekonomi Pertahanan Menghadapi Perang Generasi Keenam, Universitas Pertahanan, 2020, ISBN 978-602-5808-96-8