



Astropolitic: Indonesia's Space Diplomacy Strategy Amid us Vs China Rivalry in Space Exploration

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ABSTRACT

This study aims to analyze Indonesia's space diplomacy strategy in facing the rivalry between the US and China in terms of space exploration. The research method used is qualitative descriptive using SWOT analysis tools to analyze the right strategy. The results show that Space is an important strategic terrain, affecting security, technology, and international relations. The U.S. and China compete for space dominance, utilizing advanced technology and diplomacy. The US, with NASA and the private sector, is leading the way in international exploration and alliances such as the Artemis Accords. China, through CNSA and major investments, is also expanding in the space exploration and global satellite markets. The U.S.-China rivalry reflects global repercussions, including the risk of space weapons conflict.

INTRODUCTION

At first, space activity began in 1950 with the main competition between the United States and the Soviet Union, focusing on military and defense interests. Most early satellites served for reconnaissance of intercontinental ballistic missile programs, which peaked when tensions between the two countries were at their peak. Concerns about the use of space as a testing ground for nuclear weapons triggered treaties such as the Partial Test Ban Treaty (PTBT) and The Outer Space Treaty of 1967 (OST 1967), which encouraged the use of space in a spirit of peace and banned it as a weapons base (Dolman, 2002). In 2007, China launched an Anti Satellite Weapon System (ASAT) weapons test, raising global concern. The United States responded by testing ASAT weapons on its own satellites in 2008, exiting the Anti-Ballistic Missile Treaty (ABM-T), and leading to the creation of the U.S. Space Force in 2018 to protect space assets. This move triggered the formation of similar forces by other countries (Johnson, 2007).

However, the formation of the Space Force raises questions about the violation of The OST 1967, which demanded the use of space for peace. Indonesia, like other countries, has not maximized its space utilization and faces great vulnerability to future space conflicts. A potential solution is to encourage the establishment of an International Space Monitoring Agency (ISMA) to monitor space activity neutrally, reduce tensions and prevent future "Star Wars" (Grego, 2012). Even the competition between the United States and China in space exploration has intensified in recent years. Both countries are investing heavily in space technology, lunar exploration, satellite systems, and space infrastructure. This competition focuses not only on technological competition, but also on strategic interests, national security considerations, and geopolitical influence (Wright, 2005).

In 2019 the President of the United States signed Space Policy Directive IV which caused various controversies from various countries. This decision is quite surprising because Article IV of the 1967 Outer Space Treaty (the OST) clearly prohibits the use of military force in the sense of aggressive force. Furthermore, the existence of the Space Force can threaten third-tier countries such as Indonesia to maintain and secure its assets in space, besides that Indonesia has always been very active in promoting peaceful use in space (Weeden, 2010). Indonesia is faced with a number of complex challenges in carrying out space diplomacy amid the US-China rivalry. One of them is technology dependence, where Indonesia relies heavily on foreign technology and international cooperation to develop space programs. US-China competition also affects the dynamics of technology exports, posing obstacles that need to be overcome (Moltz, 2011).

The next challenge is geopolitical pressure that requires Indonesia to maintain a balance in its diplomatic relations with the US and China. This must be done without sacrificing national interests and sovereignty in any space activity undertaken. Limited resources and infrastructure are also serious obstacles, limiting Indonesia's ability to develop space initiatives independently, especially in large-scale projects (Gruss, 2018).

Nevertheless, Indonesia has great opportunities in space diplomacy. The potential for regional leadership is wide open, with Indonesia's ability to position itself as a leader in space cooperation in the Southeast Asian region. This could open the door to closer partnerships with surrounding countries and significant contributions within the framework of regional space arrangements (Jakhu et al., 2016).

International collaboration is also an important opportunity for Indonesia. By actively participating in joint projects, Indonesia can access the advanced technology, scientific expertise, and financial resources needed to effectively develop its space program. Investment in capacity building is also key, with the development of human resources, research institutions, and adequate infrastructure to support Indonesia's space progress (Harrison et al., 2020). In this overall context, Indonesia has significant challenges but also great opportunities in conducting space diplomacy. The right strategy, solid international cooperation, and efficient resource management will be the key to success for Indonesia in navigating this complex space diplomacy landscape.

LITERATURE REVIEW

Space Diplomacy

The theory of space diplomacy highlights the importance of international relations in the exploration and utilisation of outer space. Space diplomacy encompasses international cooperation in scientific research, satellite launches, and the use of space technology for peaceful purposes. This is crucial to prevent an arms race in space and ensure the safe and sustainable use of space. Examples of the application of this theory include the Artemis Accords and collaboration between NASA and other space agencies, such as the European Space Agency (ESA) (Dolman, 2002).

Strategy

The theory of strategy involves the comprehensive planning and execution of actions to achieve long-term goals and objectives. It encompasses the analysis of an organisation's internal and external environments to make informed decisions that provide a competitive advantage. Strategy theory includes various models and frameworks, such as SWOT analysis and Porter's Five Forces, to guide strategic planning. It is used across different fields, including business, military, and public policy, to develop and implement effective strategies (Mintberg, 1994).

METHODOLOGY

This research is descriptive with a qualitative approach, where initially the author explained about space diplomacy. After that, the author discussed the perspective of space diplomacy and the US vs China rivalry and its impact. Furthermore, the author describes every subtheme about space diplomacy. The research methods used are literature study and secondary data analysis. Data is taken from various sources in the form of library materials, consisting of previous research, scientific journals, books, government reports, official news, and information from trusted and relevant websites related to the space diplomacy.

Data analysis techniques use theories from Milles, Huberman and Saldana (2014), namely *data collection*, *data condensation*, *presenting data (data display)*, and *drawing conclusions or verification (conclusion drawing and verification)*. The validity test of the data used is *Credibility* (Internal Validity), *Transferability* (External Validity), *Dependability* (Reliability) and *Confirmability* (Objectivity) carried out at each stage it is described in the following research design:

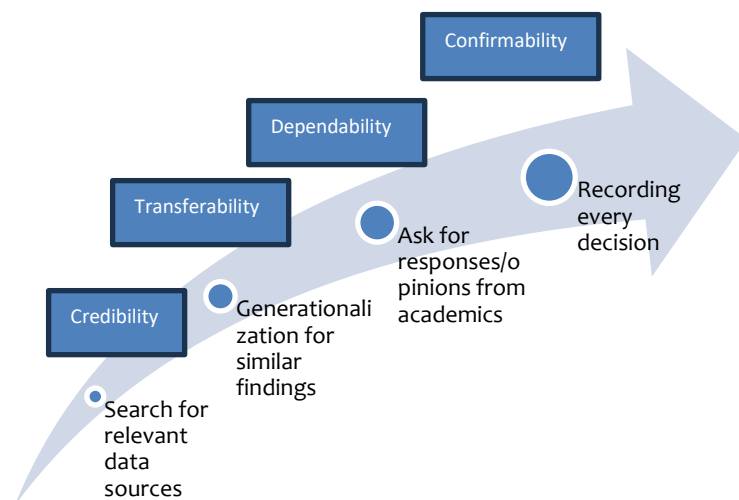


Figure.1 Research Design

Source : Processed by the author, 2024

The analysis was carried out to obtain the accuracy of the research results and the approach used by researchers is really consistent if used by other researchers in different topics (Gibbs, 2007 and Creswell, 2017).

RESEARCH RESULT

Space Significance

Space became a vital instrument for the power of the country due to its superior characteristics and potential. Figures such as Alec Robinson stated that space is now on par with other battlefields such as land, sea, and air. According to Robinson, space allows the operation and achievement of the country's strategic objectives, having even greater threat potential than attacks from the ground (Robinson, 2005). Space is not only a support, but can become an independent battlefield. Sun Tzu in "The Art of War" mentions the importance of mastering the "plateau," which in the modern context means mastering space

with advanced technology and a wide monitoring range (Sun Tzu, 1963). Countries that control space have a strategic advantage in enhancing military capabilities. Space that was previously used for peaceful research is now a military instrument. China, for example, explores space for national security and increases international influence. The United States has proven the contribution of space technology in battlefields such as the Gulf War (Operation Desert Storm), referred to as the first space war, as well as subsequent conflicts such as the Kosovo War and battles against Al Qaeda and the Taliban (Bennet, 2008).

In addition, information technology is now the center of world civilization, making space a possible arena for future battles. Jeffrey Bennett stated that space will be the center of gravity in future wars. This pattern dates back to the Cold War era with the term "Star Wars," which describes the race between the United States and the Soviet Union in space exploration programs. The launch of "Sputnik 1" by the Soviet Union on October 4, 1957 sparked global attention to the importance of space mastery. The United States responded by forming NASA and launching the "Apollo" program. To this day, the United States continues to dominate the mastery of space, thanks to NASA's productivity in space-related research and development, including space weapons. President John F. Kennedy affirmed that space is a medium such as land, sea, and air, where military activities are carried out to achieve US national security objectives (Launius, 2019). The explanation is illustrated in the following figure 2:

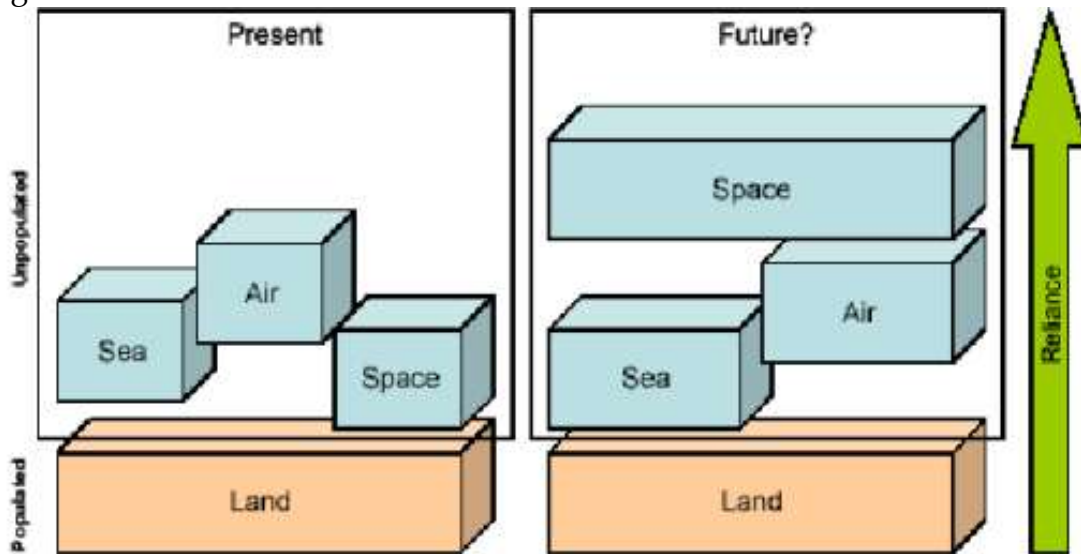


Figure.2 The Future Arena of War

Source : Marshall et al., 2005

Table.1 Space Competitiveness Index 2024

Country	Space Competitiveness Index
United States	99.67
Japan	48.76
Russia	45.29
China	41.85
Canada	39.10
India	28.64
South Korea	15.22
Israel	9.30
Australia	5.22

Source : Futron, 2024

Based on the Space Competitiveness Index (SCI) 2024, the United States currently dominates in terms of space exploration with a value of 99.67 compared to China which is in fourth place with a value of 41.85. In other words, the United States is in first position and China is fourth after Japan and Russia. This means that the US is still superior to China in terms of space exploration, but this does not rule out the possibility that China will continue to develop its space exploration. To calculate the SCI, Futron Corporation uses 50 separate metrics categorized into three groups for each country. These three resource groups are government, industry, and human resources. Each group has its own weight in determining the overall SCI score. Government and industry each accounted for 40% of the total score, while human resources accounted for 20% (Futron Corporation, 2020).

U.S. Steps in Space Exploration

The United States has a long history in space exploration that began with the Apollo program that delivered humans to the moon in 1969. Today, NASA (National Aeronautics and Space Administration) continues to lead space exploration with various ambitious programs, including the Artemis mission aimed at returning humans to the moon and preparing for a manned mission to Mars (Logsdon, 2010) In addition, the U.S. also leverages the private sector to drive innovation in the space industry. Companies like SpaceX and Blue Origin have played an important role in developing more efficient launch and exploration technologies. SpaceX, for example, has successfully launched Falcon rockets and developed Starship, a space vehicle designed for missions to Mars (Logsdon, 2010).

In terms of diplomacy, the US has taken steps to form strategic alliances through the Artemis Accords, an international agreement that establishes a framework for the peaceful exploration and use of space resources. This agreement aims to invite participation from allied countries and ensure US leadership in space exploration (Bleddyn, 2020). In addition, the US is also intensifying in space force related to the right to self defense in Article 51 of the UN Charter justifying the use of armed force under certain conditions, with the approval of the UN Security Council. The United States formed the Space Force as a form of self-defense against foreign threats, especially from China and Russia, which have developed anti-satellite weapons (ASAT) technology. This development was considered a threat by the US, which responded by creating a Space Force under Article 51 (Weeden et al., 2021).

The United States has a long history of using Self Defense through preventive measures. For example, in 2002, the US used its military force to invade Iraq to prevent the use of weapons of mass destruction (WMD). The principle of interest and proportionality is crucial in the context of Self Defense, as affirmed by the International Court of Justice (ICJ) in the Oil-Platform case. The ICJ emphasizes that attacks must be legitimate and meet clear self-defense objectives to avoid prolonged warfare (Weeden et al., 2021). Space Policy Directive 4 underpins the creation of the Space Force, reflecting U.S. concerns over the military capabilities of China and Russia, as well as Iran and India, which are rapidly expanding in Intelligent Surveillance Reconnaissance (ISR), Directed Energy Warfare (DEW), and Electronic Warfare (EW) technologies. The report from the Defense Intelligence Agency (DIA) suggests that threats from such countries could hurt the US and its allies. Therefore, the Space Force aims to protect national interests in space, ensuring the peaceful use of space in accordance with international law, including The Outer Space Treaty 1967 (Weeden et al., 2021).

Space Policy Directive 4 also states that Space Force will be stationed within the Department of the Air Force and trained to deal with offensive and defensive threats. However, the principle of peace in international space law stipulates that the placement of military bases in space must not threaten other parties, which may lead to further debate about the interpretation and implementation of the law (Weeden et al., 2021). Space, the Moon, and other celestial bodies in international law have the status of "common heritage of mankind" (*res communis omnium*) that must be used for peaceful purposes, as stipulated in Article 1 of the 1967 Outer Space Treaty (OST). The formation of the Space Force caused debate among legal experts because it was considered contrary to the principle of using space for peaceful purposes (Weeden et al., 2021).

After World War II, various international treaties such as the 1949 Geneva Convention and the 1949 United Nations Charter were created to prevent major wars. The principle of peace was first mentioned in the 1959 Arctic Treaty System, and later adopted in the 1967 OST Article 4, which states that the Moon and other celestial bodies should only be used for peaceful purposes (Weeden et al., 2021). In the discussion of the 1967 OST, there were differing views between the United States and the Soviet Union regarding military involvement in space. The United States proposed that military activities of a non-aggressive nature were allowed, while the Soviet Union wanted a total ban on military activities in space (Weeden et al., 2021).

Article 4 of the 1967 OST states that military activities in space are permissible as long as they are not aggressive in nature. The 1979 Moon Agreement made it clear that the Moon and other celestial bodies must be used in accordance with international law and to maintain international peace. Article 3 paragraph 2 of the 1979 Moon Agreement confirms that any threat or use of force on the Moon is prohibited (Weeden et al., 2021). The NASA Act of 1958 separates civilian space activity by NASA and military activity by the Department of Defense (DoD). The United States insists that non-aggressive space activities conducted by the military for research and peaceful purposes are permissible (NASA, 2023).

The interpretation of the peaceful principle in space law is divided into three: (1) peaceful activities in space must not involve the military, (2) military activities are permissible if not aggressive, and (3) the obligation of non-aggressive military activities applies only to the Moon and other celestial bodies, while the placement of weapons of mass destruction is prohibited. International space law must also abide by the UN Charter to maintain international peace and security (Weeden et al., 2021). The use of weapons in space is closely related to Space Policy Directive 4 which reflects both offensive and defensive objectives. This is contrary to The OST 1967 and Moon Agreement 1979 which govern the peaceful use of space. ASAT (Anti-Satellite Weapons) have been around since the Cold War and restrictions were discussed between the US and the Soviet Union, but failed after the Soviet invasion of Afghanistan. The US, China, and India also conducted ASAT tests, raising space junk and security tensions (Weeden et al., 2021).

There is no specific legal instrument for ASAT until 2019. The 1967 OST banned nuclear weapons in orbit, but ASAT launches without nuclear warheads remain ambiguous regarding the principle of peaceful use. Weapons such as ICBMs also need attention because they pass through space regulated by The OST 1967 (Weeden et al., 2021). Various efforts to prevent a Third World War in space include the 1963 Partial Test Ban Treaty and the SALT treaty between the US and the Soviet Union to limit ABM weapons. However, the US withdrew from ABM-T 1972 in 2002. The militarization of space has occurred since the 1950s with the launch of spy satellites and the aiming of ICBM weapons. To date, about 270 satellites are in Low Earth Orbit (LEO) with 24 of them belonging to the US (Weeden et al., 2021).

In the 1991 Gulf War, space was used for military operations involving 200 satellites and \$200 billion in operation Desert Storm. The use of space in the military is increasingly growing with C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) technology. Efforts to control space militarization need to be increased to prevent the escalation of global conflicts (Weeden et al., 2021).

China's Measures in Space Exploration

China, on the other hand, has shown rapid progress in its space program. The China National Space Administration (CNSA) has successfully launched an impressive series of space missions, including the launch of the Tiangong space station and the Chang'e mission that successfully landed on the moon and Mars (National Security Analysis) (Rumsfeld, 2023). In 2023, China set a record by launching more than 200 satellites in 60 missions, achieving a 100 percent success rate with Long March series rockets. This achievement signifies a significant increase in technological capacity and space exploration ambitions (Rumsfeld, 2023). In the realm of diplomacy, China has strengthened cooperation with Russia on its space program. The two countries signed a memorandum of understanding (MoU) for joint lunar exploration and sharing of important technologies. This cooperation not only enhances their technological capabilities but also strengthens their position in the face of US dominance in space (Rumsfeld, 2023).

China recognizes the importance of developing a massive space program to compete in the international arena. While many doubt China's ability to become a major power in space because of its enormous costs, its economic capabilities have allowed the country to invest more than \$1 billion in its space program. China's military budget increased by 325% from 2000 to 2012, reaching US\$121 billion, supporting space exploration (Wang, 2024). China's space program also encourages industrial innovation, which is a key factor in their economic growth. China's 2006 space development white paper states that the space industry is an important part of the national development strategy that will continue to be developed sustainably (Rumsfeld, 2023).

In May 1985, China announced its intention to commercialize space fleet launch services with Long March rockets. Test launches were conducted in Zhubo, Japan, from May to September 1985. The crash of the U.S. "Challenger" and Europe's "Ariane" satellites opens up opportunities for China to enter the commercial launch market. China offers launch services at a lower price, around US\$30-55 million per launch (Northeastern Global News, 2024). China is also making a major expansion into the international satellite market, with satellite export agreements to countries such as Nigeria and Venezuela. For example, the price of a satellite for Nigeria is as high as US\$300 million. This success is not only a commercial transaction but also part of China's diplomatic agenda. Satellite exports are a tool to strengthen diplomatic relations and expand China's global influence (Northeastern Global News, 2024).

China's space industry has a significant impact on labor-intensive and creative industries. The industry employs many workers and is expected to improve their skills in technology. The mechanical training provided to workers will benefit the economic aspect, enabling specialization that can also improve technology in other sectors (Northeastern Global News, 2024).

In the defense sector, China's space technology projects are fully supported by the government. The People's Liberation Army (PLA) has undertaken reforms to strengthen technological and scientific capabilities. China's 2006 Defense White Paper said the PLA wanted power in information, which could only be met with a robust space program. The PLA believes that the power of data and information will enhance China's ability to detect and exploit opportunities on the battlefield and deter adversaries. Through analysis of United States military operations, the PLA realized the importance of space instruments in providing, collecting, and transmitting information. Remote sensing satellites, for example, can monitor enemy forces and provide strategic intelligence before a battle begins. Communication satellites provide a global network and facilitate communication with forces, even in enemy areas. Navigation satellites provide up-to-date location information and improve tracking of weapon positions (Rumsfeld, 2023).

China has also conducted tests of anti-satellite weapons (ASATs), showing that they are one of the most progressive actors in space technology. This is part of a deterrence strategy to deal with potential attacks by the United States. Chinese defense analyst Wang Hucheng stated that America's dependence on space is a strategic weakness that adversaries can exploit. Former US Secretary of Defense, Donald Rumsfeld, also stated that this dependence opens an opening for adversaries to attack (Rumsfeld, 2023). The development of China's space technology corresponds to the concept of Security Dilemma, in which American dominance in space is perceived as a threat to China, and vice versa. A US Department of Defense report on June 19, 2005 suggests that China's military developments could affect global power constellations, triggering a space technology race (Wang, 2024). China's space advances have also enhanced their symbolic status internationally. Shenzhou's launch program has broad support from the Chinese public, who take pride in their country's technological capabilities. This space exploration program shows that China is a country to be reckoned with in international politics.

Implications of U.S.-China Rivalry

The rivalry between the US and China in space exploration has major implications for global dynamics. The two countries use their space programs as a tool of diplomacy to expand influence and form international alliances. For the US, the Artemis Accords became a powerful instrument of diplomacy, inviting allied nations to participate in joint space missions and setting operational standards for space exploration. This helps the U.S. maintain its global leadership in space technology and exploration (Northeastern Global News, 2024).

On the other hand, China uses a bilateral cooperation approach with countries like Russia to build its own capabilities and network of alliances. This cooperation allows China to share technology and resources, as well as reduce their dependence on Western technology that is often limited by sanctions (National Security Analysis, 2024). Space diplomacy between the United States and China has had a significant impact on the global geopolitical order and technological developments. These two countries are engaged in a fierce competition for space dominance, which impacts many aspects ranging from global security, technology development, to the economy (National Security Analysis, 2024).

In terms of global security, competition between the U.S. and China in space exploration and use creates complex dynamics and has the potential to fuel tensions. Both are developing advanced space military technology, including satellites for reconnaissance and communications, as well as anti-satellite capabilities. The development raises fears of a new arms race in space, which could increase the risk of conflict if not managed properly. Both countries are also increasingly enhancing their capabilities in defense and cyberattacks, adding a layer of complexity to their strategic competition (Wang, 2024). Technologically, space diplomacy between the U.S. and China is driving significant innovation and progress. Both countries are investing heavily in research and development to strengthen their positions. The United States, through NASA and its Space Force program, continues to push the boundaries of technology with ambitious missions such as Mars exploration and the development of advanced propulsion systems. Meanwhile, China has made remarkable progress with its aggressive space program, including the launch of manned missions to the Moon, the development of the Tiangong space station, and Mars exploration missions (Rumsfeld, 2023).

This competition also has an impact on the global economy. Both countries seek to harness the economic potential of space exploration, including asteroid mining, commercialization of space travel, and development of more sophisticated satellite infrastructure. The United States, with the dominance of private companies such as SpaceX and Blue Origin, has paved the way for wider commercialization of outer space. China, through its national space agency and major technology companies such as CASC and CASIC, is also working to strengthen its space sector. This creates new economic opportunities that can stimulate growth and innovation in various sectors (CNSA, 2024). Moreover, space diplomacy between the US and China has major implications for international relations. The two countries influenced the space policies of other nations and formed a new strategic alliance. The United States tends to cooperate with its allies in Europe, Japan and India on various space projects, while China strengthens its ties with Russia and other developing countries through initiatives such as the Belt and Road Space Information Corridor. This creates geopolitical blocs that can affect global dynamics (Rumsfeld, 2023).

However, there is also potential for cooperation amid this competition. Both countries recognize the importance of managing space peacefully and sustainably. Cooperation in space debris mitigation, scientific research, and humanitarian missions can be areas where diplomacy can drive positive outcomes for all parties. International organizations such as the United Nations (UN) and the United Nations Committee for the Peaceful Use of Space (COPUOS) play an important role in organizing and facilitating this cooperation (COPUOS, 2024). Overall, space diplomacy between the U.S. and China has far-reaching and complex impacts, spanning global security, technology, economics and international relations. Although this competition poses challenges, the potential for innovation and cooperation is also open, which can bring great benefits to humanity as a whole. Prudent and balanced diplomacy will be key to managing these dynamics for a peaceful and sustainable future in space.

Indonesia's Space Diplomacy Strategy Amid US vs China Rivalry in Space Exploration

The development of space forces in the context of international law aims to change a principle that has been held for more than 50 years, encouraged by developed countries to dominate space activities. According to Harding and Moltz's theory, Indonesia is categorized as a third-tier country that has policies and investments in space, but does not yet have adequate technology and launch facilities. Third-tier countries tend to use space peacefully due to their limited technological capabilities (Wang, 2024). Indonesia is more dominant in using diplomatic channels to show its existence, such as in the 1976 Bogota Declaration which aimed to secure the interests of equatorial countries in the Geostationary Orbit (GSO) satellite slot. Although the threat of Star Wars is unpredictable, Indonesia must prepare for contingencies that threaten its interests in space. Therefore, Indonesia needs to clarify its position in terms of space security

The potential threat of space force to world peace and Indonesia's interests requires Indonesia to take a firm stance. In line with the Preamble of the 1945 Constitution and Article 4 of the 1967 OST, Indonesia must reject space force by first and second tier countries. However, from a realistic point of view, Indonesia needs to upgrade its Air Force (AU) to secure its skies and assets in space. Law No. 20 of 1982 affirms the AU's duty to defend aerospace territory, but Law No. 34 of 2004 only mentions the AU's duty to secure airspace, not space. This is a setback in the current dynamics of space development. Indonesia has seven active satellites that support important activities such as the economy, disaster mitigation, and telecommunications. This asset protection is an obligation for the prosperity of the nation in accordance with Article 33 paragraph (3) of the 1945 Constitution. The state must ensure justice and social welfare for the Indonesian people in the context of the welfare law state.

To analyze this, researchers use SWOT analysis tools. The SWOT analysis diagram is shown by depicting the widest position area by attaching the coordinate points of each SWOT aspect according to the value or score of each aspect. Figure 1.1 shows that the visualization of the components of Opportunities, Threats, Strengths and Weaknesses shows that the strategy that should be used is a Progressive strategy in Quadrant I, that is, creating a strategy that uses strengths to take advantage of opportunities. Calculation of Strength Posture and Competitive Posture. Cumulative calculation of the variability of each factor that has been obtained value or score from the result of multiplying weights with scales. Depiction of the widest position area by attaching the coordinates of each SWOT aspect according to the value or score of each aspect.

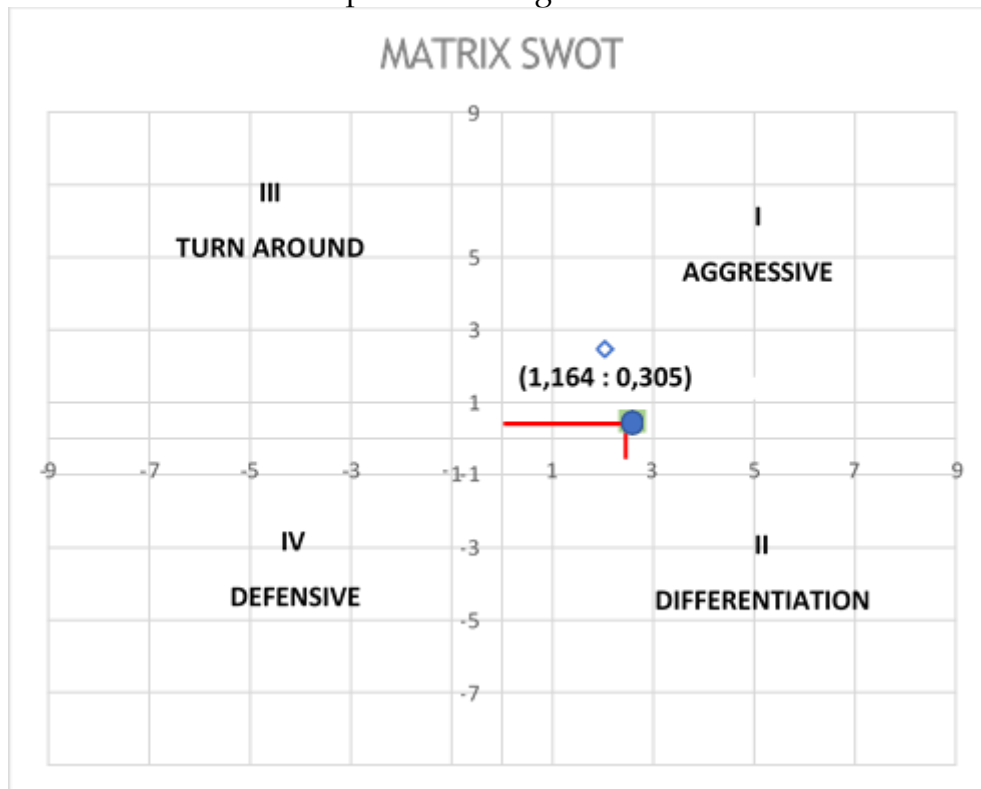


Figure.3 Graph SWOT Matrix
 Source : Data Processed by Researchers, 2024

Based on the SWOT Matrix, it can be seen that the position of the strategy is in the I-quadrant called the aggressive strategy or strength opportunity (SO) so that the strategy that must be applied is as follows: In the context of intensifying global competition between the United States (US) and China in space exploration, Indonesia has significant potential to play a strategic role through space diplomacy. With its strategic geographical position and peaceful diplomatic policy, Indonesia can take advantage of its strengths and opportunities to develop an effective space diplomacy strategy.

Indonesia, with its strategic position along the equator, has great potential to become a key player in the space exploration arena. Its ideal location for satellite launches gives Indonesia a unique advantage that can be utilized to strengthen national capabilities in space technology (Nugraha, 2019). The peaceful and neutral diplomatic policy, which has become Indonesia's trademark, makes it suitable to act as a mediator between two major world powers, the United States and China, which are currently involved in space exploration rivalry (Susanti, 2020). Increasing technological capabilities through investment in the National Institute of Aeronautics and Space (LAPAN) is a significant first step. LAPAN has conducted various research and development of satellite technology that can support Indonesia's space diplomacy strategy (Prasetyo, 2021). With a flexible foreign policy and non-aligned approach, Indonesia can establish cooperation with various countries without having to side with one of the great powers (Wibowo, 2022).

Indonesia's space diplomacy strategy can focus on several key aspects that combine existing strengths and opportunities. First, strengthen international cooperation in space research and exploration. This cooperation is not only with developed countries such as the US and China, but also with developing countries that have similar visions in the peaceful use of space (Saragih, 2021). Through multilateral forums such as COPUOS (Committee on the Peaceful Uses of Outer Space), Indonesia can play an active role in formulating international policies that support safe and sustainable space exploration.

Secondly, the development of space technology must continue to be improved. Investment in this technology will not only strengthen national capabilities but also provide added value in Indonesia's space diplomacy (Harahap, 2022). The development of satellite technology, rocket launchers, and space communication technology should be the top priority. With its strong technological capabilities, Indonesia can offer technical solutions to other countries and improve its bargaining position in international negotiations.

Third, leverage the reputation of peaceful diplomacy to mediate between the U.S. and China. The rivalry between these two major countries in space exploration can be an opportunity for Indonesia to position itself as a neutral and trustworthy mediator (Yusuf, 2022). Indonesia can facilitate dialogue and cooperation between the U.S. and China on various space exploration projects, such as missions to Mars or the construction of an international space station.

Fourth, the exploration of the space economy should be the main focus. The economic potential of exploration and utilization of space resources is enormous. Indonesia must take part in the utilization of these resources, both through international cooperation and national initiatives (Santoso, 2021). The development of the space industry can create new jobs, increase state income, and strengthen the national economy.

Fifth, the development of education and training programs in the field of space. Strong education and adequate training will produce competent human resources who are ready to face the challenges of space exploration (Hidayat, 2020). This educational program should cover various aspects of space technology, space mission management, and space policy and regulation.

Sixth, attract investment from the private sector for the development of the space industry. Collaboration between the government and the private sector will accelerate the development of technology and innovation in the space sector (Purwanto, 2021). Private investment can be allocated to research and development, satellite manufacturing, rocket launches, and other space exploration projects.

Seventh, improving satellite infrastructure to support telecommunications, disaster mitigation, and environmental monitoring. Strong infrastructure will increase Indonesia's capacity in various space technology applications, which in turn will support space diplomacy efforts (Rahman, 2021). This infrastructure will also strengthen Indonesia's ability to respond to natural disasters and manage natural resources more effectively.

Eighth, increased regulations that support the development of the space industry. Clear and supportive policies and regulations will create a conducive environment for the development of space technology and attract investment from various parties (Sari, 2022). This regulation must cover aspects of security, environmental protection, and international cooperation in space exploration.

Ninth, participation in international space projects such as the ISS or missions to Mars. By engaging in these projects, Indonesia can learn from countries that are more advanced in space technology and build stronger national capabilities (Wijaya, 2020). This participation will also raise Indonesia's international profile in the global space community.

Tenth, the development of innovative technologies that can be used in various sectors, including agriculture, fisheries, and disaster mitigation. Space technology has wide applications and can provide great benefits to various economic and social sectors (Lestari, 2021). This innovation will improve the quality of life of the community and strengthen national resilience.

By combining these strengths and opportunities, Indonesia can formulate a comprehensive and effective space diplomacy strategy. This strategy will not only strengthen Indonesia's position in the international space community but also provide significant economic and social benefits for the nation (Budianto, 2021). Close cooperation with countries, sustainable technology development, and investment in human resources will be key to success in the face of the U.S.-China rivalry in space exploration.

CONCLUSIONS AND RECOMMENDATIONS

Space is now on par with other battlefields such as land, sea, and air, and enables the country's strategic operations and poses a major potential threat. Sun Tzu stressed the importance of mastering the "plateau," which in a modern context means space with advanced technology. Countries that control space have a strategic military advantage. China and the U.S. have used space for national security purposes. Space technology proved vital in conflicts such as the Gulf War and the fight against Al Qaeda. Space control also plays a role in the dominance of global information technology, as seen since the "Star Wars" era and the launch of "Sputnik 1".

The United States has a long history of space exploration, beginning with the Apollo program in 1969. NASA continues to lead the way with the Artemis mission and plans for a manned mission to Mars. The private sector, such as SpaceX and Blue Origin, plays an important role in launch technology innovation. The US formed an alliance through the Artemis Accords for peaceful exploration. The Space Force was formed to defend itself against threats from China and Russia, in accordance with Article 51 of the UN Charter. The development of space technology, such as ASAT, has led to debate over the principle of peaceful use of space in international law.

China has made significant progress in its space program through CNSA, with the launch of the Tiangong space station and the Chang'e mission to the moon and Mars. In 2023, China will launch more than 200 satellites on Long March rockets. China cooperated with Russia in lunar exploration, strengthening its position in the face of U.S. dominance. Major investments in space programs support industrial innovation and economic growth. China is also expanding the international satellite market, increasing its global influence. The space program is fully supported by the government and the PLA, which utilizes the technology for military and defense purposes.

The U.S.-China rivalry in space drives global diplomacy and technology. The U.S. Artemis Accords and China-Russia bilateral cooperation reflect different approaches. The two countries are fighting for dominance, driving innovation, and influencing the global economy through space exploration. The impacts include global security at risk of a space arms race, economic growth through space commercialization, and international relations formed through strategic alliances. While great challenges exist, cooperation is also possible, especially in peaceful and sustained efforts in space that require prudent diplomacy.

Indonesia, as a third-tier country in space, uses diplomacy for existence and interests such as through the 1976 Bogota Declaration. However, the threat of space force prompted Indonesia to review its space security position. Despite rejecting tier one and two space forces as per the 1945 Constitution and 1967 OST, Indonesia needs to renew its Air Force to protect vital space assets. The protection of Indonesia's active satellites in accordance with Article 33 of the 1945 Constitution is important for security and social welfare, demanding concrete steps in the evolving dynamics of space.

Indonesia's space diplomacy strategy includes: 1) strengthening international cooperation in space research; 2) development of space technology; 3) mediate the U.S.-China rivalry with peaceful diplomacy; 4) space economic exploration; 5) development of education and training programs; 6) attract private investment; 7) improvement of satellite infrastructure; 8) improved regulation of the space industry; 9) participation in international projects; 10) development of innovative technologies across sectors.

ADVANCED RESEARCH

Mastery of outer space is now on par with other battlefields such as land, sea, and air, enabling strategic operations and posing significant threats. Sun Tzu emphasized the importance of mastering the "high ground," which in modern terms means advanced space technology. Countries that control space have a strategic military advantage. The United States and China use this technology for national security, as demonstrated in conflicts like the Gulf War and the fight against Al Qaeda. The rivalry between these two nations drives global diplomacy and innovation. As a third-tier country, Indonesia needs to strengthen international cooperation, develop space technology, and enhance satellite infrastructure and industry regulations.

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