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The Impact of Advanced Technology on Indonesia's National Security Stability

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Abstract

In the current era of ever-growing globalization, technological progress has become one of the main pillars in changing the perspective of human life. Apart from that, cyber security is also one of the main pillars in efforts to develop Indonesia's digital economy. This study aims to examine the positive and negative impact of advanced technology on Indonesia's National Security Stability. The method used is a descriptive research method carried out qualitatively. This study formulated the efforts that can be taken to maintain the stability of the Indonesian defense and security system in facing the negative impacts of technological developments. Several efforts that can help face the negative impacts of technological developments are the development of cyber defense capabilities, strengthening security and data protection, diversification and strengthening of Human Resources, collaboration with the private sector and universities, and strict supervision and control system. Some of these things must be implemented with continuous commitment and efforts so that Indonesia's defense and security capabilities can be very resilient and be able very resilient and will continue to grow and get stronger in the future.

INTRODUCTION

In the current era of ever-growing globalization, technological progress has become one of the main pillars in changing the perspective of human life. In the midst of rapid development, countries throughout the world, including Indonesia, are experiencing significant transformations in various aspects of human life, including national security. The influence of technological progress on national security stability in Indonesia has become an important concern. The impact of technological advances on national security

stability in Indonesia is becoming increasingly important and must be understood and anticipated.

Indonesia's national security is a public policy used to ensure the safety and security of the country through the use of economic and military power, as well as the implementation of diplomacy. Indonesia is an archipelagic country, so it has its challenges in maintaining national security. Cultural, ethnic, and religious diversity, along with geographic diversity, provide a unique context for Indonesia's national security. In addition, cyber security is becoming an increasingly urgent issue in the geopolitical context of Indonesia, where cyber protection, investment in cyber technology, and increasing international cooperation in the field of cyber security are important (Adiwidya, 2023). Apart from that, cyber security is also one of the main pillars in efforts to develop Indonesia's digital economy (Ministry of Communication and Informatics, 2023). Therefore, the stability of Indonesia's national security is an important issue in the context of the impact of technological progress. Even though Indonesia's macroeconomic stability is still below that of several ASEAN countries, the Indonesian government has designated political stability and security as one of the national priorities in the 2018 Government Work Plan (Finaka, 2017). Security stability is a key factor in the development and progress of a country. When the stability and security of a country are threatened, various aspects of people's lives can be disrupted, from economic, social, and political. Therefore, the role of technology in maintaining and improving national security stability is becoming increasingly crucial.

Real data shows that the phenomenon of cyberattacks against the Indonesian state has increased significantly in the last few years. The National Cyber and Crypto Agency (*Badan Siber dan Sandi Negara* or BSSN) noted that the incoming cyberattack was aimed at damaging national security and critical infrastructure. Apart from that, the use of technology by terrorist groups is also a phenomenon that the authorities must immediately address. However, technological advances have also made a major contribution to border monitoring, disaster management, and increasing the speed of response to threats. Various aspects of advanced technology, such as artificial intelligence, the Internet of Things (IoT), and advanced military technology, also play a role in strengthening the country's defense system. The application of artificial intelligence technology in intelligence data analysis also helps authorities to be more effective in identifying potential incoming threats. Thus, the importance of understanding and managing the impact of technological progress in the context of Indonesia's national security becomes increasingly urgent. Technology that brings great benefits in strengthening national defense also raises new challenges that require appropriate strategies and policies. By adhering to the principles of cyber security, collaboration between countries, and developing quality human resources, Indonesia is expected to be able to face national security challenges more effectively in the era of modern technology. Therefore, this study aims to examine the positive and negative impact of advanced technology on Indonesia's National Security Stability.

METHODS

The method used in writing this article is a descriptive research method carried out qualitatively. In this case, the analysis concerns the impact of technological advances on Indonesia's defense and security system. After that, it is formulated about the efforts that can be taken to maintain the stability of the Indonesian defense and security system in facing the negative impacts of technological developments.

RESULT AND DISCUSSION

The Positive Impact of Advance Technology on Indonesia's National Security Stability

The development of advanced technology has had a positive impact on the stability of Indonesia's national security. It can also be reviewed through several relevant theories. Technological development can increase a country's defense capabilities, as explained in national security theory. Apart from that, technological developments can also strengthen the national security system through monitoring and early detection of threats in accordance with the concept of an early warning system. Technological developments that have occurred have played a role in helping strengthen aspects of a country's cyber defense. It is becoming increasingly important in dealing with threats that occur in cyberspace. Several analyses regarding the positive impact of advanced technology on the stability of Indonesia's national security include:

1. Increased Order
   Increasing order can occur through several aspects, such as the influence of transportation technology and advances in science and technology in the political, economic, socio-cultural, and defense fields. For example, advances in transportation technology can increase efficiency in monitoring border areas and help the mobility of security personnel. It has the potential to improve order and stability of national security (Badung Transportation Department, 2018).
2. Strengthening Cyber Security
   Strengthening cyber security can increase Indonesia's resilience to threats in cyberspace. It includes developing security systems, training human resources, and implementing international cooperation in fighting cybercrime (Nafisah, 2023). Apart from that, technological advances can also enable the government to monitor and protect critical infrastructure, such as electrical installations, transportation systems, and other public services, from cyberattacks. Thus, strengthening cyber security can contribute to national security stability by protecting the country's vital assets from interference and attacks in cyberspace in the current digital era.
3. Technology Integration in Military Defense
   Through the integration of technology in military defense, Indonesia can obtain better defense capabilities. It can be achieved by optimizing the use of the defense budget, as well as strengthening defense, security, and national integration. Some of these efforts can contribute to the stability of Indonesia's national security.
4. Increased Intelligence and Data Analysis
   One aspect is advances in data analysis technology and artificial intelligence, which enable intelligence agencies to identify potential threats more accurately and quickly (Prihandoko, Triantama, Wahyudi, & Priamarizki, 2023). Apart from that, the integration of technology in intelligence activities can also strengthen the ability to detect, prevent, and deal with various security threats, including terrorism, transnational crime, and armed conflict, which can have a significant impact on national security stability (Lubis, 2016).
5. Public Security System
   Technological advances enable the government to increase the transparency and accountability of public bodies, which are designed to increase public trust and strengthen national security and stability. Through the integration of technology into the public security system, Indonesia can gain better capabilities in dealing with various security threats, as well as increase public trust through transparency and accountability. It will later contribute to the stability of Indonesia's national security.

With technological advances that continue to develop, Indonesia's defense and security system has undergone many significant transformations. The use of modern technology in various aspects, as mentioned above, has strengthened the State's ability to maintain sovereignty, deal with threats, and protect the security of its citizens. Even so, challenges will threaten Indonesia's defense and security system, including dealing with cyber threats and dependence on foreign technology. Therefore, constant efforts are needed to develop national technology, cross-sector coordination, and teamwork between human resources and technology as the key to ensuring that Indonesia's defense and security system is resilient for the integrity and security of the Indonesian State in the future.

The Negative Impact of Advance Technology on Indonesia's National Security Stability

Advanced technology provides many benefits, but it also has negative impacts that need to be considered because they can affect the stability of Indonesia's national security. Some analyses regarding these negative impacts involve several aspects, such as cyber security, potential misuse of technology, and social challenges. The following are some of the negative impacts, including:

1. Cybersecurity Threats
   Cyber security threats that can occur include hacking attacks, digital espionage, and information dissemination. Some of these things can disrupt national security stability by damaging critical infrastructure, stealing sensitive data, or even influencing public opinion. Therefore, the protection of cyber security is becoming increasingly important in ensuring the stability of Indonesia's national security in the current digital era.
2. Use of Technology for Crime
   The use of technology for crime can worsen the national security situation, such as the use of drones to carry out terrorist attacks or the use of technology to produce illegal weapons.
3. Dependence on Foreign Technology
   Dependence on foreign technology can disrupt national security stability. For example, dependence on the energy industry can pose a risk of energy supply disruption due to international conflicts, which can increase cyber security risks (Prabowo & Sihaloho, 2023). Apart from that, dependence on foreign technology can also affect Indonesia's ability to develop national technology and industry, thereby weakening national security stability. Therefore, efforts are needed to reduce dependence on foreign technology and increase investment in the national technology industry.
4. Technology Gap Between States
   Technological gaps can worsen the national security situation, such as unequal access to cyber security technology and intelligence capabilities. It can weaken the country's ability to face security threats. If technological development is uneven across regions, it can exacerbate inequalities and create social instability.
5. Inequality of Technology Access
   Not all levels of society or regions in Indonesia have equal access to the advanced technology that currently exists. It can create social divisions and inequalities that can affect national stability. In addition, unequal access to technology can worsen the national security situation, such as unequal access to cyber security technology and intelligence capabilities, which can weaken the country's ability to face security threats.

In facing various influences from technological developments in defense and security, which have dire consequences for Indonesia, several efforts are needed to

overcome these problems. Several efforts to maintain the stability of the Indonesian state defense and security system in facing the negative impacts of technological developments are as follows.

1. Development of Cyber Defense Capabilities
   Cyber threats to critical infrastructure, sensitive data, and military operations are increasing in a complex digital era. Cyber defense capabilities are needed to protect critical infrastructure, sensitive data, and military communication systems from cyber threats. Therefore, Indonesia needs to increase its focus on efforts to develop cyber solid defense capabilities sustainably to protect itself from cyber attacks that have the potential to undermine national security stability (Azis & Utami, 2019). Several efforts can be made to develop cyber defense capabilities possessed by the Indonesian nation, namely:
   a. Development of clear national policies and strategies, including legal and regulatory frameworks, inter-agency coordination strategies, and setting priorities for cyber threats.
   b. Provision of education and training in cyber defense for government employees, members of the military, and the private sector involved in cyber security.
   c. Establishment of a team of cybersecurity experts and laboratories to identify and address cyber threats and test the security of critical systems and infrastructure.
   d. Establishing cooperation with other countries to fight cyber threats by exchanging information and collaborating in handling cyberattacks internationally to improve overall cyber defense capabilities.
   e. Invest in state-of-the-art security technology and infrastructure to protect Indonesia's information and critical infrastructure, including intrusion detection systems, data encryption, and robust firewalls.
   f. Development of local human resources in the field of cyber defense, including education and training of cyber security experts and supporting the development of the domestic cyber security industry.
   g. Conduct monitoring and security audits of information systems and critical country infrastructure regularly to identify potential vulnerabilities and take appropriate action.

   Implementing some of these efforts can increase the Indonesian nation's ability in the cyber defense field and mitigate the negative impact of cyberattacks on the defense and security system of Indonesia. These efforts can also assist Indonesia in maintaining national security stability and protecting sensitive data and essential infrastructure from cyber threats that are increasingly complex and diverse over time.
2. Strengthening Security and Data Protection
   Increasingly sophisticated information technology brings great benefits and potential risks to sensitive data and critical infrastructure. Technological developments have affected the increased risk of data leakage or misuse. Strict security and data protection strengthening are needed to prevent illegal access or manipulation of government and military sensitive data (Presidential Regulation of the Republic of Indonesia Number 39 of 2019 concerning One Indonesian Data). Several efforts can be made to strengthen data security and protection in the defense and security of Indonesia, namely:
   a. Implement strong data encryption to protect critical information stored in computer systems and networks to protect sensitive data from unauthorized access.
   b. Oversight from the government or related agencies to ensure that the systems and networks used to store and process sensitive data have a strong layer of security,

including implementing firewalls, intrusion detection systems, and other network security devices.

c. Provide appropriate cyber security training to all personnel managing sensitive data and critical infrastructure. Training is conducted to increase awareness about cyber threats and assist them in identifying and overcoming potential vulnerabilities.
d. Conduct regular security audits by the government to identify potential vulnerabilities and security gaps in systems and networks to prevent and detect security threats early.
e. Adopt and deploy advanced technology-based security solutions such as artificial intelligence (AI) and behavior analysis to proactively detect and address emerging cyberattacks.
f. Develop a comprehensive data security policy to govern the management and protection of sensitive data, including measures for prevention, detection, response, and recovery from security attacks.

Strengthening security and data protection is an essential step that the Indonesian people must take to maintain the stability of the national defense and security system. Implementing these efforts can increase cyber resilience and protect essential data from increasingly complex and diverse threats.

3. Diversification and Strengthening of Human Resources (HR)

Skilled and qualified human resources are critical factors in maintaining the stability of the defense and security system in the current era of technological developments. This diversification refers to efforts to find, develop, and utilize human resources with various expertise, backgrounds, and experiences. Diversification of expertise and strengthening of training for military and security personnel is urgently needed to increase adaptability to technological developments. Therefore, strengthening human resources must involve education, training, and skills development so that the personnel involved have superior capabilities in carrying out their national defense and security duties. Several efforts to diversify and strengthen human resources can be carried out to maintain the stability of the defense and security system of the State of Indonesia, namely:

a. Diversification of backgrounds and expertise by seeking and recruiting human resources from various backgrounds and expertise, including professionals in information technology, intelligence analysis, cyber security, foreign languages, diplomacy, and others. It will later enrich the human resource capabilities of the Indonesian people so that they can face various complex and varied challenges.
b. Provision of adequate education and training to human resources involved in state defense and security following their duties and responsibilities. The education and training provided include military training, special training for cyber security, intelligence, and other skills relevant to their duties and responsibilities.
c. Develop a continuous skills development program for personnel to ensure they have the latest knowledge and skills in dealing with the development of new threat technologies that continue to change with the times.
d. Collaborating and cooperating between agencies and sectors in dealing with complex defense and security challenges.
e. Recognition of personnel achievements and continuing to motivate them to contribute optimally by the government and military leaders to increase the morale and dedication of personnel in carrying out defense and security duties.

Diversification and strengthening of human resources is a long-term investment needed to maintain the stability of the national defense and security system. By

having well-educated and well-trained personnel and a variety of expertise, Indonesia will be better prepared to face various challenges that may arise in the present or future.

4. Collaboration with the Private Sector and Universities

   Indonesia must promote collaboration with the private sector and universities in defense technology research and development. It is to strengthen national capabilities in dealing with threats and utilizing the latest technology in defense and security systems. It is hoped that collaboration between these parties can increase the capacity of the university sector in Indonesia to find solutions to pressing development challenges in Indonesia (U.S. Embassies and Consulates in Indonesia, 2018). Some of these collaborative efforts are:

   a. Utilization of advanced and innovative technology owned by the private sector to deal with more complex security threats.
   b. Conduct research and development with universities so that they can encourage the development of innovations and intelligent solutions that support the national defense and security system.
   c. Training and development of human resources provided by special tertiary institutions for military and security personnel to improve the quality and expertise of human resources in defense and security.
   d. Through collaboration with the private sector, the government can gain more accessible access to the latest military equipment and services to increase the country's defense capability in facing external threats.
   e. Conduct strategic research and development with universities and the private sector that supports national defense and security policies.

   Collaboration between the government and the private sector or universities is essential for maintaining the state's defense and security stability. This collaboration opens opportunities to utilize expertise and technology from the private sector and research and innovation from universities to strengthen the national defense and security system.

5. Strict Supervision and Control System

   A strict monitoring and control system is essential for maintaining stability in the defense and security system of the Indonesian State. Adequate supervision and control can prevent abuse of power and leakage of strategic information and ensure compliance with established standards and procedures (Sitorus, 2019). Several efforts in a strict monitoring and control system, namely:

   a. Use solid data security and encryption systems to protect sensitive data and state strategic information from illegal access or hacking.
   b. Conduct routine audits and checks on defense and security systems to help identify gaps and weaknesses and ensure compliance with established procedures.
   c. Implement internal and external oversight mechanisms to oversee the implementation of defense and security system policies and operations; even external oversight may involve independent institutions or designated authorities.
   d. Provide strict sanctions and penalties for violations of discipline or security in the defense and security system to provide a deterrent effect and prevent violations for perpetrators.
   e. Ensuring that the human resources are qualified and responsible for the defense and security system they hold. In addition, they provide adequate qualifications and training to related human resources so that they can carry out their duties professionally.

Applying a strict monitoring and control system in the defense and security system of the Indonesian State is expected to provide solid security and stability. In this way, Indonesia can face challenges more resiliently and ensure that the integrity and sovereignty of the country are well maintained.

With continuous commitment and efforts in dealing with the negative impacts of technological developments, it is hoped that the Indonesian people will be able to maintain the stability of the national defense and security system. Wise use of technology coupled with the efforts mentioned above, if implemented thoughtfully, will make Indonesia's defense and security capabilities very resilient and able to develop sustainably. That way, it is ensured that the integrity and security of the Indonesian state will continue to grow and get stronger in the future.

CONCLUSIONS AND RECOMMENDATIONS

In the current era of ever-growing globalization, technological progress has become one of the main pillars in changing the perspective of human life. In the midst of rapid development, countries throughout the world, including Indonesia, are experiencing significant transformations in various aspects of human life, including national security. Apart from that, cyber security is also one of the main pillars in efforts to develop Indonesia's digital economy. Therefore, the stability of Indonesia's national security is an important issue in the context of the impact of technological progress. However, technological advances have also made a major contribution to border monitoring, disaster management, and increasing the speed of response to threats. The positive impact of technological progress on Indonesia's national security stability includes increased orders, strengthened cyber security, technology integration in military defense, increased intelligence and data analysis, public security system. Apart from that, technological advance also has a negative impact on national security stability, including cybersecurity threats, use of technology for crime, dependence on foreign technology, technology gap between states, and inequality of technology access.

The impact of technological developments on the Indonesian defense and security system has several important implications that need to be considered. Therefore, it is necessary to take concrete actions to deal more effectively with the various impacts of technological developments to maintain the stability of the national defense and security system for a more secure and resilient future. Some steps that can be taken include increasing investment in research and development, increasing focus on cyber defense, prioritizing technological independence, increasing training, and improving human resources.

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