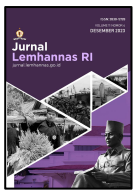

Jurnal Lemhannas RI (JLRI)
E-ISSN : 2830-5728, P-ISSN: 2252-8555
Vol. 12 No. 3, September 2024: 277-298
DOI: 10.55960/jlri.v12i3.940
https://jurnal.lemhannas.go.id/index.php/jkl

Technological Pride and National Resilience: How Innovation Shapes Stability and Security?

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Article Info:

Keywords:
Cybersecurity,innovation,national resilience,technological pride

Article History:
Received : 12-02-2024
Revised : 28-03-2024
Accepted : 30-09-2024

Article DOI :
10.55960/jlri.v12i3.940

Abstract

Purpose: This study examines how technological innovation influences national resilience, stability, and security in Indonesia. It focuses on cybersecurity, digital infrastructure, and renewable energy as key factors in strengthening national unity and mitigating internal and external threats. The study also explores how technological pride fosters social cohesion and enhances Indonesia's role as a regional technology leader in ASEAN.

Design/Methodology/Approach: A qualitative research approach is used, analyzing secondary data from government reports, policy documents, academic literature, and media sources. Thematic analysis identifies patterns in technological innovation, national security, and public confidence. A case study approach examines Indonesia's cybersecurity strategies, digital transformation policies, and renewable energy initiatives. Triangulation is applied to ensure data validity and reliability.

Findings: Findings show that technological pride strengthens public confidence, particularly in times of crisis, such as the COVID-19 pandemic. Investment in digital infrastructure and cybersecurity enhances national security by reducing cyber threats. Progress in renewable energy supports energy independence, reducing reliance on fossil fuels. Indonesia's technological leadership in ASEAN also fosters regional security cooperation, particularly in cybersecurity and energy security.

Originality/Value: This study provides a comprehensive perspective on the intersection of technological advancement, national resilience, and security, an area that remains underexplored in Indonesia. Unlike previous studies focusing on cybersecurity or energy separately, this research links these aspects to national stability and geopolitical influence. The findings offer practical insights for policymakers and security agencies, emphasizing the need for sustained investment in innovation, digital literacy, and strategic collaboration to maintain Indonesia's long-term technological resilience and security.

How to cite : Sarjito, A. (2024). Technological Pride and National Resilience: How Innovation Shapes Stability and Security?. *Jurnal LemhannasRI, 12*(3), 277-298. https://doi.org/10.55960/jlri.v12i3.940

E-ISSN: 2830-5728

INTRODUCTION

In the 21st century, technological innovation has emerged as a key factor in shaping a nation's resilience, stability, and security. In Indonesia, technological pride, or the national sense of pride derived from technological advancements, is becoming increasingly important in strengthening national unity and enhancing the country's position in global and regional security dynamics. This study explores how Indonesia's technological progress, particularly in cybersecurity, digital infrastructure, and renewable energy, contributes to its national resilience and secures its position as a regional leader in Southeast Asia.

While Indonesia has made substantial progress in technological development, the country continues to face multiple security challenges that require innovative solutions. The increasing reliance on digital technology has heightened vulnerabilities to cyber threats, making cybersecurity a crucial pillar of national defense. Additionally, the expansion of digital infrastructure has played a significant role in economic development, but it also presents challenges in ensuring equal access and preventing security breaches. Moreover, the shift towards renewable energy is not just an environmental initiative; it also has significant implications for national security, particularly in reducing dependence on fossil fuel imports and mitigating risks associated with global energy fluctuations.

The frequency and nature of cyberattacks in Indonesia have fluctuated over the past four years, reflecting both the evolving cybersecurity landscape and the nation's ongoing efforts to address digital threats. Below is a summary of key data illustrating trends in cyberattacks from 2020 to 2023, highlighting notable patterns and incidents.

Table 1.Trends in Cyberattacks in Indonesia (2020–2023)

Year	Cyberattacks (in Millions)	Key Notes
2020	495.33	A significant increase in attacks during the COVID-19 pandemic due to higher online activity.
2021	1,645	Drastic rise attributed to phishing, malware, and ransomware threats.
2022	370.02	Decline from the previous year, though data breaches remained high, with 35 major incidents.
2023	279.84	Continued decline, but Jakarta reported the highest regional impact, with 100.98 million incidents

Source: BSSN (2023); CFDS (2022); Statista (2023)

This data underscores the pressing need for enhanced cybersecurity measures in Indonesia, especially in urban regions like Jakarta, which experience the highest cyberattack rates. The notable decline in attack numbers from 2021 to 2023 reflects improving defenses but also calls for sustained vigilance to counter increasingly sophisticated threats. However, while national strategies such as the National Cyber and

DOI: 10.55960/jlri.v12i3.940

E-ISSN: 2830-5728

Crypto Agency (BSSN) have contributed to mitigating these risks, there remains a need for more proactive policies and investments in cybersecurity resilience, particularly in sectors such as finance, e-governance, and digital infrastructure.

Recent literature highlights the critical role of technological advancements in fostering national security. For instance, Zhang et al. (2020) assert that technological innovation is central to a nation's self-reliance and resilience, particularly in the face of geopolitical tensions and natural disasters. Similarly, Jewett et al. (2021) emphasize that technological pride can unite citizens and foster social cohesion, particularly during times of crisis. Despite this, gaps exist in the literature regarding the specific impact of technological pride on national resilience, particularly in the context of Indonesia. While studies such as Heinl (2014) and Fitriana et al. (2024) discuss cybersecurity and renewable energy innovations, there is limited research examining the broader link between technological pride and national security.

Furthermore, the role of digital infrastructure in economic and security resilience is another aspect that requires further exploration. The expansion of broadband and mobile networks has accelerated digital transformation across Indonesia, but disparities in technological accessibility between urban and rural areas persist. The question of how digital inequality impacts national stability and resilience remains largely unexplored in existing literature. Similarly, renewable energy initiatives, such as Indonesia’s commitment to achieving 23% renewable energy in its total energy mix by 2025, highlight the strategic importance of energy independence in national security. Yet, little research has examined how renewable energy policies intersect with technological pride and societal trust in government initiatives.

This study aims to explore this relationship by focusing on how innovation in key technological sectors shapes Indonesia’s national stability and geopolitical influence. Through qualitative methods and secondary data analysis, this research seeks to fill these gaps by analyzing how Indonesia’s technological achievements contribute to national security, foster social cohesion, and enhance the country's regional influence within ASEAN. The structure of the article will be as follows: first, an overview of Indonesia’s technological achievements; second, an analysis of the relationship between technological pride and national resilience; third, an exploration of Indonesia’s role in regional security dynamics; and finally, conclusions and policy implications for leveraging technological innovation to strengthen national and regional stability.

E-ISSN: 2830-5728

Literature Review

This research draws upon several key theories and previous studies to explore the role of technological pride in enhancing national resilience, stability, and security in Indonesia. One central theoretical framework for this study is Social Identity Theory (Tajfel & Turner, 2003), which asserts that individuals derive part of their identity from the social groups to which they belong. Applied to national resilience, this theory suggests that pride in national technological achievements can strengthen collective identity, fostering unity and social cohesion. In Indonesia's case, national pride in technological innovations, such as cybersecurity advancements and renewable energy projects, can act as a unifying force, especially in times of crisis, thus contributing to national stability and resilience.

Additionally, Innovation Diffusion Theory Rogers et al. (2014) offers a useful lens for understanding the spread and impact of technological innovations on society. According to this theory, the adoption of new technologies is crucial in building national resilience by enhancing efficiency, self-reliance, and security. Indonesia's adoption of innovations in digital infrastructure and renewable energy solutions directly aligns with this theory, showcasing how these advancements contribute to national stability.

Previous research emphasizes the significant role of technological advancements in strengthening national security. (Zhang et al., 2020) argue that technological innovation enhances national resilience by improving a country's capacity to respond to both internal and external challenges, including security threats. Similarly, Jewett et al. (2021) highlight the unifying effect of technological pride, noting that such pride fosters collective efforts to overcome crises.

Research on Indonesia's technological growth further supports these findings. Heinl (2014) examines the importance of cybersecurity in protecting critical infrastructure, while (Fitriana et al., 2024) highlight Indonesia's renewable energy initiatives. Both studies underscore how technological innovations contribute to Indonesia's security and resilience, both in terms of safeguarding infrastructure and reducing dependence on external energy sources.

Despite these contributions, there remains a gap in the literature regarding the specific role of technological pride in enhancing national resilience, particularly in the Indonesian context. While existing studies focus on technological advancements in isolation, fewer studies address how national pride in these achievements influences public confidence, social cohesion, and overall national stability. This study aims to fill this gap by qualitatively exploring the relationship between technological pride and

DOI: 10.55960/jlri.v12i3.940

E-ISSN: 2830-5728

national resilience, examining how pride in Indonesia's technological advancements contributes to national security, stability, and geopolitical influence.

To address this gap, the research utilizes qualitative methods, particularly secondary data analysis, drawing from government reports, policy documents, academic literature, and media sources. Thematic analysis is employed to identify recurring themes related to innovation, national pride, and security, allowing for a deeper understanding of how technological pride enhances national resilience in Indonesia. This approach provides insights into the broader implications of technological innovation, national identity, and regional security dynamics, offering a nuanced view of how technological pride serves as a stabilizing force in the face of both internal and external challenges.

METHODS

In conducting qualitative research using secondary data, the methodology focuses on interpreting and analyzing existing data rather than collecting new data directly from participants. Creswell (2014) outlines a structured approach for qualitative research that involves various steps, such as data collection, analysis, and interpretation, using pre-existing data sources like reports, documents, and previous studies. The research on *"Technological Pride and National Resilience: How Innovation Shapes Stability and Security"* benefits from secondary data analysis to explore how technological achievements contribute to a nation's sense of pride and its broader impacts on national resilience, stability, and security.

Research Design

According to Creswell (2018), a qualitative research design provides flexibility in examining complex phenomena within a specific context. The research question, "How does technological innovation shape national resilience, stability, and security?" can be explored using secondary data such as national reports, policy documents, media publications, and previously published academic research. This approach allows for an in-depth understanding of how technological advancements influence national security and stability from a historical and social perspective.

The study adopts a case study and document analysis approach (Creswell, 2014), examining multiple sources to derive conclusions about the relationship between technological innovation and national resilience. Case study methodology is particularly relevant for exploring Indonesia's technological policies, cybersecurity frameworks, and renewable energy strategies. Meanwhile, document analysis ensures that the research is

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based on credible and verifiable sources such as government reports, academic articles, think-tank reports, and global security indices.

Data Collection

In qualitative research, Creswell (2014) emphasizes the use of purposive sampling, which ensures that data are selected based on their relevance to the research questions. Secondary data sources relevant to the theme of technological pride and resilience include government documents, technological policy frameworks, security white papers, and scholarly articles. These documents offer valuable insights into national priorities, technological capabilities, and resilience strategies, including national innovation surveys, records of technological breakthroughs in defense and infrastructure, and media coverage or public opinion surveys on national pride in technology. Creswell (2014) highlights the need for transparency in data collection, ensuring all secondary data sources are properly cited and aligned with the research objectives.

Data Analysis

Creswell (2014) outlines various methods of qualitative data analysis, including thematic analysis, content analysis, and narrative analysis. For this study, thematic analysis would be suitable to identify key themes related to technological pride, national resilience, and security. The researcher would first read through the collected secondary data to identify recurring themes or patterns, such as public responses to technological advancements, government initiatives to promote innovation, or technological innovations in national defense.

Creswell (2014) suggests coding the data by identifying segments that are relevant to the research questions. In this case, codes might include "technological innovation," "national pride," "security," "resilience," and "economic stability." Once these themes are identified, the researcher can analyze how they intersect, how technological pride influences national security, and how innovation impacts resilience in times of crisis.

Interpretation and Reporting

The interpretation phase involves synthesizing the findings from the secondary data, analyzing how they answer the research questions and contribute to understanding the relationship between technology and national resilience. (Creswell, 2014) emphasizes the need to discuss how the findings relate to existing literature, highlighting any discrepancies or confirmations with previous research.

For instance, if the secondary data reveals that nations with higher technological innovation scores tend to exhibit stronger national security measures, the researcher will

DOI: 10.55960/jlri.v12i3.940

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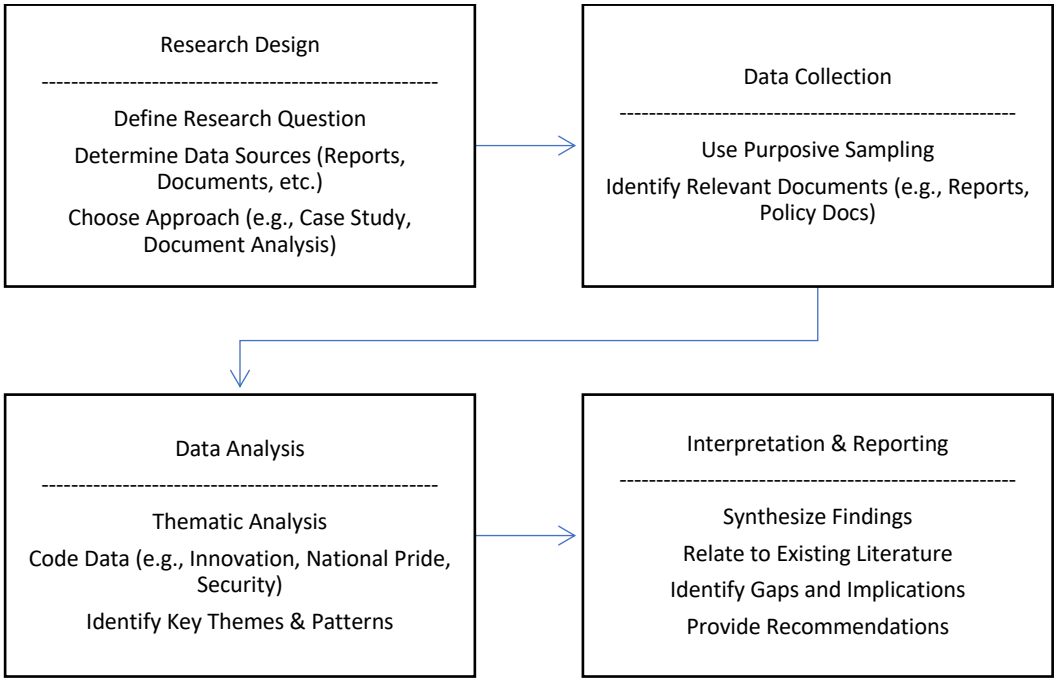
contextualize these findings in the larger literature on technology and security. The researcher could also identify any gaps in the existing data, such as the underrepresentation of certain technological sectors in national resilience studies.

Finally, the study would conclude by discussing the implications of these findings for policymakers, technology leaders, and security agencies. This would include recommendations for enhancing national resilience through strategic investments in technology and innovation.

By following Creswell's qualitative research framework, this study can effectively leverage secondary data to explore how innovation influences national resilience and security, contributing valuable insights to the field.

Qualitative research using secondary data involves analyzing existing information instead of collecting new data. (Creswell, 2014, 2018) provides a framework for this process, including defining the research question, collecting and analyzing relevant data, and interpreting results. For the study on "Technological Pride and National Resilience," secondary data like national reports and policy documents can offer insights into how technology influences national resilience and security. The following diagram outlines this research process, see figure 1.



Source: Creswell (2014)

Diagram 1. Qualitative Research Process Using Secondary Data: Technological Innovation and National Resilience

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The diagram 1 illustrates the systematic process of conducting qualitative research using secondary data, as outlined by Creswell. By following these steps, researchers can ensure a comprehensive and structured approach to analyzing the influence of technological innovation on national resilience, security, and pride. Each step, from research design to interpretation, builds upon the previous one, helping to generate meaningful insights and recommendations. The use of secondary data in this context allows for an in-depth analysis without the need for primary data collection, leveraging existing resources to answer critical questions about the relationship between technological advancements and national stability.

RESULT AND DISCUSSION

Indonesia, as a prominent emerging economy in Southeast Asia, faces numerous internal and external security challenges that require advanced technological solutions. Cybersecurity, renewable energy, and digital infrastructure are key components in strengthening Indonesia's national resilience and security.

Cybersecurity is crucial in the digital age, and Indonesia has made significant strides to improve its cybersecurity posture. The country ranked 47th out of 193 countries in the 2020 Global Cybersecurity Index, up from 59th in 2018 (ITU, 2020). The National Cyber and Crypto Agency (BSSN), established in 2017, has been instrumental in overseeing cybersecurity policies and mitigating threats like ransomware and data breaches, which became increasingly prevalent in 2020 with over 300,000 reported cyber incidents (Ma & Huang, 2022). Innovations such as AI-driven threat detection are strengthening Indonesia’s defenses and ensuring the safety of its digital infrastructure (Bahriansyah et al., 2024).

Indonesia’s commitment to renewable energy has also bolstered its national resilience. The country has set a target of achieving 23% renewable energy in its energy mix by 2025, aiming to reduce dependence on fossil fuels and mitigate risks tied to global energy fluctuations (IRENA, 2020). With substantial resources in geothermal energy, Indonesia is the world leader in geothermal power generation, producing over 2,000 MW in 2019 (IRENA, 2020). Projects like the Sundaland Project, which integrates solar and wind technologies, are key to enhancing energy security and reducing reliance on imported fuels, which further stabilizes the country’s power supply during crises (Adanma & Ogunbiyi, 2024; Usman Gabi & Mohamad Abdullah, 2023).

In digital infrastructure, Indonesia has rapidly expanded its broadband and mobile networks, reaching 74% internet penetration by 2020, which supports economic growth and security (Ramli, 2019). The 100 Smart Cities Initiative and the deployment of 5G

DOI: 10.55960/jlri.v12i3.940

E-ISSN: 2830-5728

technology are improving urban planning, resource management, and disaster response, contributing to greater national stability (Gohar & Nencioni, 2021; Shehab et al., 2021). This infrastructure enhances resilience by ensuring communication and services remain intact during emergencies and disasters.

Technological pride plays a pivotal role in national unity and stability, especially during crises. The success of digital platforms like GoPay and OVO during the COVID-19 pandemic instilled national pride and contributed to economic continuity (Tiwow & Sugiarto, 2024). Furthermore, Indonesia's investments in renewable energy and cybersecurity have bolstered its sovereignty, reducing dependency on foreign energy and defending against external cyber threats (Basak, n.d.; Praditya et al., 2023). These technological advancements foster a sense of confidence and security among citizens, promoting social cohesion.

As a regional leader in technology, Indonesia is shaping security dynamics within Southeast Asia. The country's leadership in cybersecurity and renewable energy strengthens regional cooperation, particularly within ASEAN. Indonesia's proactive role in regional initiatives like the ASEAN Cybersecurity Cooperation Strategy and its commitment to sustainable energy set a positive example for its neighbors (ASEAN, 2020; IRENA, 2020). These efforts not only enhance Indonesia's own security but also contribute to regional stability, making the country a key player in addressing emerging security challenges in the region.

To better understand how technological innovations are enhancing Indonesia's national resilience and security, it is important to examine the key sectors that have contributed significantly to the nation's strategic advancements. These sectors, cybersecurity, renewable energy, and digital infrastructure, work together to strengthen Indonesia's stability, foster national unity, and enhance its influence regionally. The following table 2 summarizes the key technological developments and their impacts on national security, resilience, and regional leadership, supported by relevant data and citations.

Table 2. Technological Innovations Contributing to Indonesia's National Resilience and Regional Security

Technological Area	Key Innovations and Developments	Impact on National Resilience and Security	Regional Influence
Cybersecurity	- National Cyber and Crypto Agency (BSSN) - AI-driven threat detection - Increased	- Enhanced protection against cyber threats, such as ransomware and data breaches (Heinl, 2014) - Safeguards critical national infrastructure (ITU, 2020)	- Strengthens Indonesia's position as a regional leader in cybersecurity policy (ITU, 2020) - Collaborates with ASEAN on cyber defense (ASEAN, 2020)

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Technological Area	Key Innovations and Developments	Impact on National Resilience and Security	Regional Influence
	cybersecurity infrastructure		
Renewable Energy	- Geothermal power generation - Solar and wind energy projects - Renewable energy target of 23% by 2025	- Reduced reliance on fossil fuels (IRENA, 2020) - Increased energy security and sovereignty (Fitriana et al., 2024) - Mitigates environmental risks	- Influences regional energy policies through ASEAN partnerships (IRENA, 2020) - Sets example for sustainable energy development (IRENA, 2020)
Digital Infrastructure	- Expansion of broadband and 5G networks - Smart cities and IoT initiatives - 100 Smart Cities initiative	- Supports economic growth and ensures communication continuity during crises (World Bank Group, 2021) - Enhances disaster management and public safety (Hartono et al., 2024)	- Promotes digital connectivity across Southeast Asia (Hutajulu et al., 2020) - Leads regional initiatives in smart cities and digital transformation (Hartono et al., 2024)

Source: compiled by author (2024)

The table 2 highlights Indonesia's strategic initiatives in cybersecurity, renewable energy, and digital infrastructure, which are driving national resilience and security. Each of these technological advancements is essential to Indonesia's capacity to face internal and external challenges. For instance, Indonesia's commitment to enhancing its cybersecurity capabilities through the establishment of the National Cyber and Crypto Agency (BSSN) and AI-driven threat detection systems has improved its defense against rising cyber-attacks (Heinl, 2014). This progress is reflected in the country's improved cybersecurity ranking globally, where it moved from 59th place in 2018 to 47th in 2020 (ITU, 2020).

In the energy sector, Indonesia's focus on renewable energy has enhanced its energy security by reducing its dependence on fossil fuels. The country's geothermal resources, which contribute significantly to its energy mix, alongside solar and wind projects, have positioned Indonesia as a regional leader in sustainable energy (IRENA, 2020). These efforts are crucial not only for environmental sustainability but also for mitigating geopolitical risks associated with fossil fuel imports (Fitriana et al., 2024).

The development of digital infrastructure, including 5G networks and smart cities, strengthens Indonesia's economic and social resilience. The country's rapid adoption of broadband and digital platforms has enhanced its crisis response capabilities and disaster management. For example, during the 2018 Palu earthquake, Indonesia leveraged smart disaster management systems to coordinate rescue efforts effectively (Hartono et al., 2024). Furthermore, Indonesia's digital transformation initiatives, such as the 100 Smart Cities program, are key to promoting public safety and urban sustainability, which are vital for national security (World Bank Group, 2021).

DOI: 10.55960/jlri.v12i3.940

E-ISSN: 2830-5728

In conclusion, Indonesia's technological innovations in cybersecurity, renewable energy, and digital infrastructure are not only advancing its national security but also influencing regional dynamics. These innovations contribute to Indonesia's growing role as a technology leader in Southeast Asia, strengthening its position in regional organizations like ASEAN and boosting its ability to address emerging challenges.

Discussion

Harnessing Technology for National Resilience: How Cybersecurity, Renewable Energy, and Digital Infrastructure Strengthen Indonesia's Security

Indonesia, as one of the largest emerging economies in Southeast Asia, faces both internal and external security challenges that necessitate robust technological innovations. In response to these challenges, technological advancements in cybersecurity, renewable energy, and digital infrastructure have played a crucial role in strengthening Indonesia's national resilience and enhancing its security framework. These innovations not only support economic growth but also safeguard critical systems and improve the nation's ability to respond to various threats, ranging from cyber-attacks to environmental disasters.

Cybersecurity Innovations and National Resilience

Cybersecurity is one of the most critical aspects of national security in the digital age. With the increasing reliance on digital platforms for communication, finance, governance, and public services, Indonesia has placed a significant emphasis on building resilient cybersecurity systems to protect against cyber threats (Aulianisa & Indirwan, 2020). According to a report by the Global Cybersecurity Index (GCI), Indonesia has improved its cybersecurity posture significantly in recent years, ranking 47th out of 193 countries in 2020, up from 59th in 2018 (ITU, 2020).

The government of Indonesia has established several initiatives to bolster national cybersecurity. One such initiative is the creation of the National Cyber and Crypto Agency (BSSN), which oversees the implementation of cybersecurity policies and provides strategic leadership in safeguarding digital infrastructure (Anjani, 2021). The rise of cyber-attacks, including ransomware attacks and data breaches, underscores the necessity of these advancements. For example, in 2020, Indonesia experienced a significant rise in cybercrimes, with over 300,000 cyber incidents reported, highlighting the vulnerability of critical infrastructure (Heinl, 2014). By investing in cybersecurity technologies such as artificial intelligence (AI)-driven threat detection systems, Indonesia

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is working to mitigate risks, safeguard national interests, and maintain the stability of its digital economy.

Renewable Energy and Energy Security

Renewable energy innovations are another critical component of Indonesia's national resilience. As a resource-rich country with significant potential in solar, wind, and geothermal energy, Indonesia has been working to reduce its reliance on fossil fuels, which often expose the country to external economic and geopolitical risks. According to the International Renewable Energy Agency (IRENA), Indonesia has set a target of achieving 23% renewable energy in its total energy mix by 2025 (IRENA, 2020). This shift is vital not only for energy security but also for mitigating the effects of climate change, which has become an increasingly prominent global challenge.

Indonesia's geothermal resources are among the largest in the world, and recent innovations in geothermal energy technologies have allowed the country to capitalize on this resource. In 2019, Indonesia generated over 2,000 MW of electricity from geothermal energy, positioning itself as the world's largest producer of geothermal power (IRENA, 2020). Moreover, the development of solar and wind energy is equally important. The Sundaland Project, a renewable energy initiative focused on integrating solar and wind technologies into Indonesia's national grid, will reduce the nation's reliance on imported energy and enhance its energy security, ensuring more stable power supply during crises (Fitriana et al., 2024).

These innovations in renewable energy contribute to Indonesia's national resilience by reducing vulnerability to energy shortages, price fluctuations, and geopolitical tensions surrounding energy supply. The integration of sustainable energy sources not only strengthens the nation's security by decreasing external dependencies but also positions Indonesia as a regional leader in green technologies.

Digital Infrastructure and National Security

The development of digital infrastructure plays a pivotal role in enhancing national resilience by supporting economic activities, improving communication, and ensuring the availability of services during crises. Indonesia's ongoing expansion of broadband internet, 5G networks, and smart cities has increased the efficiency and resilience of its infrastructure. As of 2020, Indonesia's internet penetration rate reached 74%, providing a foundation for economic growth and digital security (World Bank, 2020).

The government's 100 Smart Cities initiative, launched in 2017, focuses on utilizing digital technologies to enhance urban planning, resource management, and disaster response (Hartono et al., 2024). Smart cities use internet of things (IoT) devices

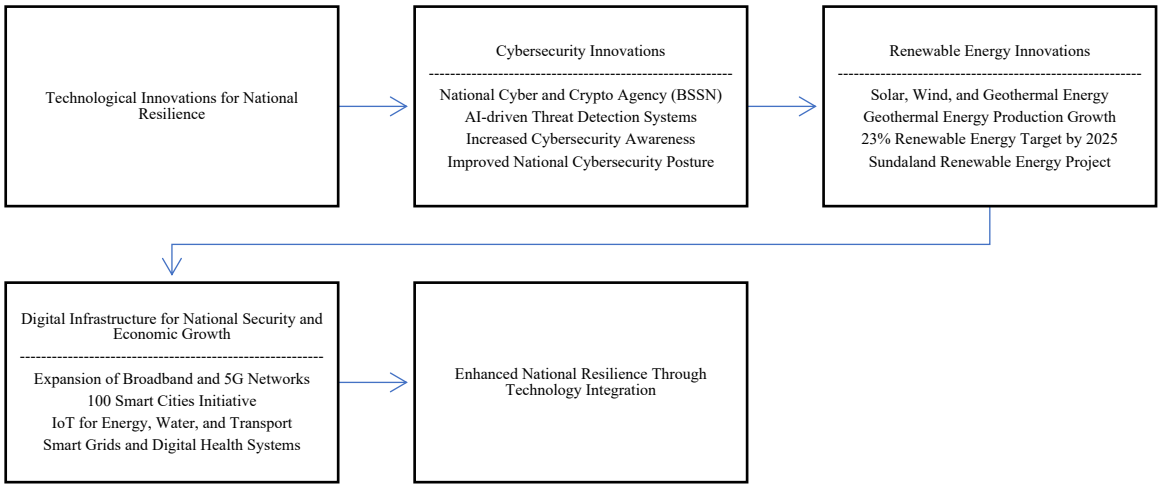
DOI: 10.55960/jlri.v12i3.940

E-ISSN: 2830-5728

to improve the management of energy, water, and transportation systems, which are vital for maintaining national security during emergencies. In 2020, the government accelerated the rollout of 5G technology as part of its digital transformation agenda, which promises to boost not only economic activities but also public safety by enabling faster and more reliable communication during crises (Hutajulu et al., 2020).

The rapid development of cyber-physical systems in Indonesia's infrastructure, including smart grids and digital health systems, also ensures that the country can respond more effectively to natural disasters and security threats. These innovations in digital infrastructure enhance national resilience by ensuring that Indonesia's critical systems are better equipped to withstand disruptions caused by cyber-attacks, natural disasters, and other security challenges.

Indonesia, a major emerging economy in Southeast Asia, faces a variety of internal and external security challenges. Technological innovations in cybersecurity, renewable energy, and digital infrastructure have become essential to strengthening the nation's resilience and security. These innovations not only enhance economic growth but also safeguard critical systems and improve the nation's ability to respond to diverse threats, including cyber-attacks and environmental disasters. The following diagram outlines how these technological advancements contribute to Indonesia's national resilience.



Source: proceed by author (2024)

Diagram 2. Harnessing Technology for National Resilience: Cybersecurity, Renewable Energy, and Digital Infrastructure

The diagram 2 illustrates how various technological innovations—cybersecurity systems, renewable energy sources, and digital infrastructure—collectively strengthen Indonesia's national resilience. By enhancing cybersecurity capabilities, Indonesia safeguards its digital infrastructure and mitigates the risks of cyber-attacks. Renewable

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energy innovations reduce the nation's dependence on external energy sources, contributing to both energy and national security. Furthermore, the development of digital infrastructure, such as smart cities and IoT systems, improves the efficiency and resilience of critical services, ensuring that Indonesia is well-equipped to manage both everyday operations and crises. These combined technological advancements create a more secure, stable, and resilient Indonesia, prepared to face both present and future challenges.

The Power of Technological Pride: How Innovation Strengthens National Unity and Stability in Indonesia Amid Global and Domestic Challenges

Technological pride plays a crucial role in shaping national unity and stability, particularly in emerging economies like Indonesia. As the country strives to become a regional leader in technology and innovation, the sense of pride that emerges from technological achievements serves to reinforce national identity, foster social cohesion, and empower citizens to face both global and domestic challenges. In Indonesia, technological advancements have not only supported economic growth but also enhanced the country’s ability to respond to crises, both internal and external, through improved resilience and solidarity. This section explores how technological pride influences national unity and stability in Indonesia, especially during critical moments of global uncertainty and domestic upheaval.

Technological Pride and National Unity

Technological pride in Indonesia has increasingly become a source of national cohesion. The country's achievements in cybersecurity, digital transformation, and green energy have instilled a sense of collective achievement, which contributes to a shared national identity. This sense of pride can act as a unifying force, aligning citizens' interests and fostering solidarity in the face of both internal and external challenges.

For example, Indonesia’s successful development and deployment of digital platforms during the COVID-19 pandemic highlighted the positive role technology can play in national resilience. The GoPay and OVO platforms, which dominate the local e-payment market, were essential in facilitating contactless transactions and enabling businesses to continue operating during lockdowns (Tiwow & Sugiarto, 2024). The success of these platforms, driven by domestic technological development, not only boosted the economy but also served as a point of national pride. As Indonesian citizens adopted these technologies, there was a widespread sense of shared progress and innovation. According to a 2020 survey by PwC, 72% of Indonesians reported an increase in confidence in their country’s digital capabilities due to the pandemic’s technological responses (PwC, 2023). This sense of accomplishment in technological innovation

DOI: 10.55960/jlri.v12i3.940

E-ISSN: 2830-5728

contributed to social unity and national pride, reinforcing the national identity during a time of global crisis.

Technology as a Tool for Stability Amid Global Challenges

In the context of global challenges, such as geopolitical tensions, climate change, and economic uncertainty, technological pride has become a powerful stabilizing force for Indonesia. Technological innovations, particularly in renewable energy and cybersecurity, have enhanced Indonesia's ability to assert its independence and sovereignty on the global stage. The sense of pride associated with such innovations boosts citizens' confidence in their country's ability to navigate external pressures and maintain stability.

For instance, Indonesia's investment in renewable energy—especially in geothermal and solar power—has not only contributed to environmental sustainability but also helped reduce the country's dependency on foreign energy sources. This has increased the nation's resilience to external economic shocks, such as fluctuating oil prices or energy crises. The government's ongoing commitment to achieving a 23% renewable energy target by 2025 serves as a symbol of Indonesia's technological ambitions and reinforces national pride in environmental innovation (IRENA, 2020). The development of renewable energy technologies has given Indonesia a sense of autonomy in the face of global climate change challenges, and citizens take pride in their country's leadership in sustainable energy within Southeast Asia.

Similarly, cybersecurity innovations have strengthened Indonesia's ability to defend itself against global cyber threats, such as ransomware attacks and cyber espionage (Sarjito, 2023). The establishment of the National Cyber and Crypto Agency (BSSN) has bolstered Indonesia's defense against these challenges, enabling it to safeguard sensitive data and critical infrastructure. This effort towards cyber sovereignty has been a source of national pride, as Indonesia is increasingly seen as taking a proactive role in global cybersecurity. As a result, technological achievements in cybersecurity foster a sense of security among citizens, contributing to social stability in the face of rising global cyber threats (Heinl, 2014).

Technology and Domestic Challenges: Empowering Local Communities

Technological pride in Indonesia has also played a critical role in addressing domestic challenges, such as economic inequality, natural disasters, and social unrest. The adoption of smart city technologies and e-government systems has not only improved the efficiency of public services but also empowered local communities to take an active role in their development. The 100 Smart Cities initiative, launched by the Indonesian government in 2017, seeks to implement smart technologies to improve urban planning,

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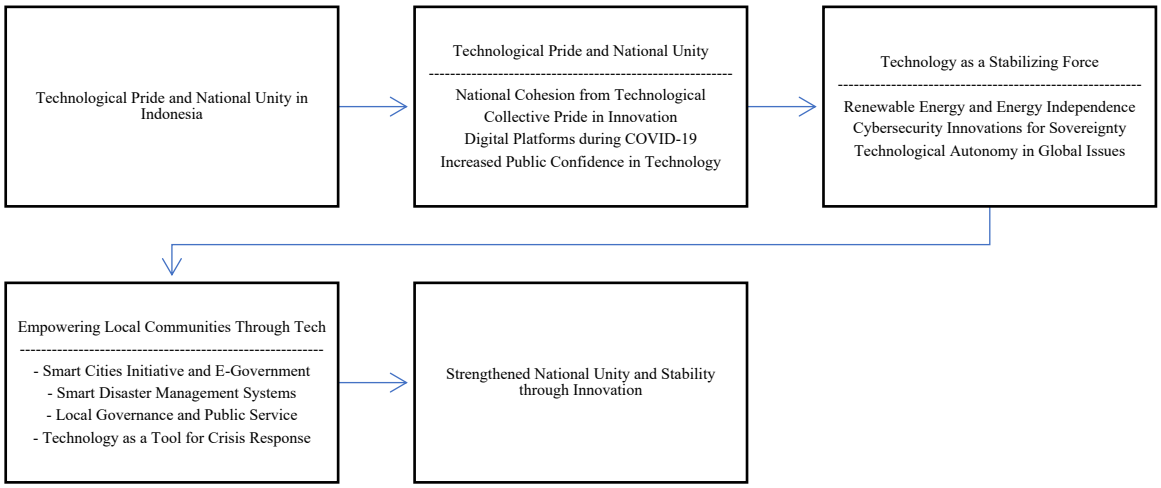
disaster management, and public service delivery (Hartono et al., 2024). As these technologies are implemented, citizens are empowered to contribute to local governance, increasing public trust in the government and reducing social unrest.

For instance, during the 2018 Palu earthquake, Indonesia's smart disaster management systems helped coordinate rescue efforts more effectively, saving lives and reducing panic. The successful use of technology in disaster response further reinforced the pride Indonesians feel in their technological capabilities. Such experiences contribute to national unity, as citizens recognize the tangible benefits of their country's technological progress in enhancing public safety and welfare. This shared pride in technological solutions helps stabilize the national psyche, creating a sense of security and collective strength.

Technological pride is a driving force behind national unity and stability in Indonesia. As the country strives to become a leader in technology and innovation, the pride derived from technological advancements fosters national identity, strengthens social cohesion, and empowers citizens to address global and domestic challenges. This section explores how technological achievements, such as in cybersecurity, digital transformation, and green energy, contribute to Indonesia's resilience, stability, and collective pride. The diagram below outlines how these elements come together to promote national unity and strength.



Source: proceed by author (2024)

Diagram 3. The Power of Technological Pride: Strengthening National Unity and Stability

The diagram 3 outlines how technological pride in Indonesia has become a crucial element for fostering national unity and stability. As the country advances in areas such as digital transformation, renewable energy, and cybersecurity, citizens take pride in these

DOI: 10.55960/jlri.v12i3.940

E-ISSN: 2830-5728

innovations, which contribute to a shared sense of identity and cohesion. This pride strengthens national resilience, not only in response to global challenges like climate change and cyber threats but also in addressing domestic issues such as economic inequality and disaster management. Technological achievements in Indonesia empower local communities, improve governance, and enhance public safety, all of which promote national stability and unity. Through these advancements, Indonesia is positioning itself as a nation of innovation and pride, ready to face both internal and external challenges.

Indonesia's Rise as a Regional Tech Leader: Impact on National and Regional Security in Southeast Asia

Indonesia, as the largest economy in Southeast Asia, is increasingly being recognized as a key player in the region's technological landscape. With significant investments in digital infrastructure, renewable energy, and cybersecurity, Indonesia is positioning itself as a regional technology leader. This strategic focus on innovation not only drives economic growth but also plays a crucial role in shaping the country's national and regional security dynamics. By advancing its technological capabilities, Indonesia enhances its ability to respond to both internal security challenges and external geopolitical pressures, while also strengthening its influence within the Association of Southeast Asian Nations (ASEAN) and on the global stage.

Indonesia’s Position as a Regional Technology Leader

Indonesia's technological growth can be seen in its rapidly expanding digital economy, which is one of the fastest growing in Southeast Asia. According to a report by Vora-Sittha & Chinprateep (2021), Indonesia’s internet economy reached USD 44 billion in 2020 and is projected to grow to USD 130 billion by 2025, driven by increased adoption of e-commerce, digital payments, and cloud services. Indonesia’s e-commerce market, in particular, is the largest in Southeast Asia, with platforms like Tokopedia, Bukalapak, and Shopee leading the market (Vora-Sittha & Chinprateep, 2021). These advancements are supported by a growing digital infrastructure, including the expansion of 4G and 5G networks, which improve connectivity across the archipelago.

Indonesia’s smart city initiatives and investments in renewable energy technologies, such as geothermal power and solar energy, also contribute to its position as a regional technology leader. The country's commitment to achieving 23% renewable energy by 2025 aligns with its broader strategy to enhance technological capabilities in response to global environmental challenges and energy security needs (IRENA, 2020).

E-ISSN: 2830-5728

In addition to these achievements, Indonesia has made significant strides in the field of cybersecurity. The establishment of the National Cyber and Crypto Agency (BSSN) in 2017 and the introduction of the Cybersecurity Bill in 2021 are key steps in reinforcing the country's cybersecurity infrastructure and protecting national digital assets (Heinl, 2014). These efforts have positioned Indonesia as a leading force in the region for addressing digital threats, which is vital for safeguarding its rapidly growing digital economy and ensuring national security in an increasingly interconnected world.

Influence on National Security

Technological leadership in Indonesia plays a crucial role in the country's national security strategy. As the country develops its digital capabilities, it strengthens its ability to respond to internal threats such as cyber-attacks, economic instability, and natural disasters. For example, Indonesia's investment in cybersecurity technologies allows it to protect critical infrastructure, such as the energy grid, telecommunications, and financial systems, from both domestic and international threats. This is particularly important as cyber-attacks become more sophisticated and frequent, posing significant risks to national security. According to the Cybersecurity Index 2020 by the International Telecommunication Union (ITU), Indonesia has made significant strides in cybersecurity, ranking 47th globally, and is seen as a regional leader in cybersecurity policy development (ITU, 2020).

Moreover, Indonesia's technological innovations in renewable energy and digital infrastructure enhance its energy security and economic resilience, which are essential components of national security. By reducing its reliance on imported energy and ensuring a more stable power supply, Indonesia mitigates vulnerabilities related to energy dependence. The development of smart grids and renewable energy sources, particularly in rural and remote areas, also contributes to stability by addressing regional disparities and fostering social cohesion.

Influence on Regional Security Dynamics

As Indonesia strengthens its position as a regional technology leader, it significantly influences the security dynamics within Southeast Asia. Indonesia's technological advancements enhance its ability to shape regional cooperation on issues such as cybersecurity, climate change, and energy security. As a member of ASEAN, Indonesia's leadership in technology enables it to play a central role in formulating regional policies and agreements that address emerging security challenges.

For example, Indonesia has been instrumental in promoting regional cooperation on cybersecurity within ASEAN. In 2020, Indonesia hosted the ASEAN Cybersecurity Cooperation Strategy, which aimed to improve information-sharing, strengthen regional

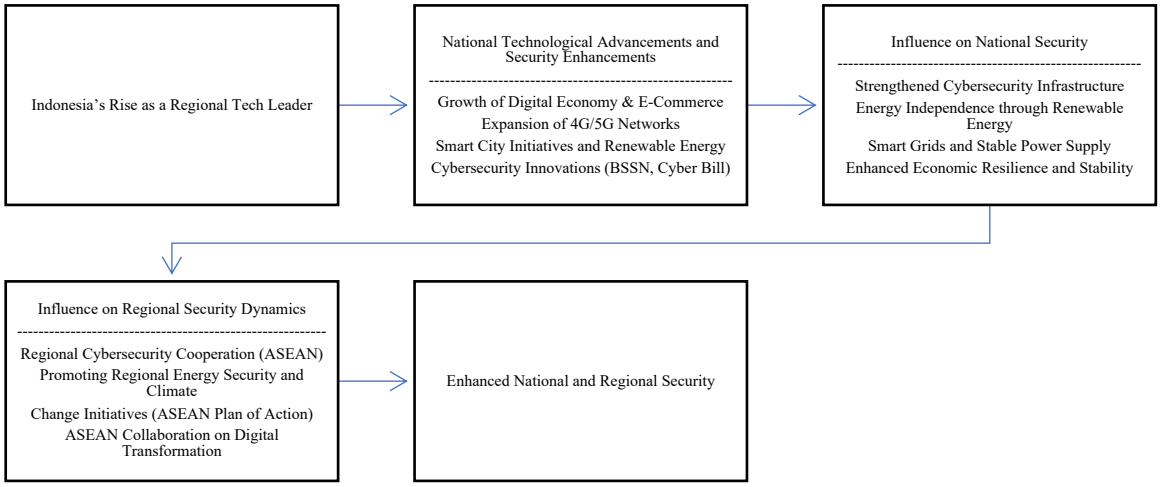
DOI: 10.55960/jlri.v12i3.940

E-ISSN: 2830-5728

cyber defenses, and address cybercrime across the region (ASEAN, 2020). As a leading technology player, Indonesia's involvement in such initiatives helps foster trust and collaboration between ASEAN member states, enhancing collective security in the region.

In the energy sector, Indonesia's commitment to renewable energy has set a regional example, influencing neighboring countries to adopt similar sustainable technologies. Through initiatives like the ASEAN Plan of Action for Energy Cooperation, Indonesia plays a key role in promoting energy security and sustainability in Southeast Asia, positioning itself as a regional leader in addressing climate change and ensuring energy independence for all ASEAN countries (IRENA, 2020).

As Southeast Asia's largest economy, Indonesia is positioning itself as a regional leader in technology, impacting both national and regional security dynamics. By investing in digital infrastructure, renewable energy, and cybersecurity, Indonesia is strengthening its security capabilities while asserting itself as a key player in regional cooperation within ASEAN. The diagram below illustrates how Indonesia's technological advancements contribute to its national security and shape regional security dynamics, fostering collaboration and resilience across Southeast Asia.



Source: proceed by author (2024)

Diagram 4. Indonesia's Rise as a Regional Tech Leader: Impact on National and Regional Security

The diagram 4 highlights Indonesia's rise as a regional technological leader and its positive influence on both national and regional security. Through advancements in digital infrastructure, renewable energy, and cybersecurity, Indonesia strengthens its national security by enhancing resilience to cyber threats, ensuring energy independence, and fostering economic stability. Regionally, Indonesia's technological leadership allows

E-ISSN: 2830-5728

it to promote cooperation within ASEAN, driving initiatives for cybersecurity collaboration and energy security. By setting an example in renewable energy and digital transformation, Indonesia is contributing to regional stability and shaping the future of Southeast Asia's collective security framework.

CONCLUSION

Technological innovations in cybersecurity, renewable energy, and digital infrastructure are central to enhancing Indonesia's national resilience and security. These advancements not only protect critical infrastructure and energy systems but also contribute to the overall stability of the nation in the face of external and internal threats. By investing in these areas, Indonesia is positioning itself as a leader in Southeast Asia and strengthening its capacity to respond to global challenges. As the country continues to innovate in these fields, technological resilience will play an increasingly important role in safeguarding Indonesia's security, economic stability, and geopolitical influence in the coming years.

Despite progress, challenges remain in optimizing cybersecurity defenses, ensuring energy sustainability, and bridging the digital divide. Strengthening regulations, increasing investment in research and development, and enhancing collaboration between government, industry, and academia will be key to addressing these challenges effectively

Technological pride in Indonesia has emerged as a powerful force for national unity and stability, particularly in response to global and domestic challenges. From enhancing economic resilience during the COVID-19 pandemic to asserting technological sovereignty in the face of global cybersecurity threats, Indonesia's technological innovations have reinforced national pride and fostered solidarity. This collective pride not only enhances the country's resilience but also creates a unifying force that strengthens the nation's stability. As Indonesia continues to invest in digital transformation, renewable energy, and cybersecurity, technological pride will remain an essential component in fostering national unity and responding to both domestic and global challenges.

However, technological achievements must be accompanied by tangible benefits for the public. Expanding digital literacy, improving access to technology in remote areas, and ensuring equitable opportunities in the tech sector will further strengthen national resilience. Public engagement in technological advancements will not only enhance innovation but also sustain long-term trust and national cohesion.

DOI: 10.55960/jlri.v12i3.940

E-ISSN: 2830-5728

Indonesia's position as a regional technology leader has far-reaching implications for its national security and regional stability. Through its advancements in cybersecurity, digital infrastructure, and renewable energy, Indonesia is strengthening its ability to safeguard its national interests and address both internal and external security challenges. Additionally, as a technological leader, Indonesia is enhancing its influence within ASEAN, contributing to regional cooperation on critical security issues such as cybersecurity, energy security, and climate change. As Indonesia continues to invest in these areas, its role as a technology leader will remain essential in shaping both national and regional security dynamics.

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