

Polri 4.0: Future Challenges for the Indonesian National Police in the Development of Information Technology (IT) and Artificial Intelligence

Dr. St. Laksanto Utomo, S. H., M. Hum.¹, Dr. Lenny Nadriana, S.H., M.H.²

¹Professor at Universitas Bhayangkara Jakarta Raya
Email: laksanto.utomo@dsn.ubharajaya.ac.id

²Associate Professor at Universitas Dirgantara Marsekal Suryadarma
Email: lennylecture@gmail.com

Abstract: *This paper examines the challenges faced by the Indonesian National Police (Polri) in the era of the Fourth Industrial Revolution, particularly in response to the rapid advancement of information technology (IT) and artificial intelligence (AI). The rapidly evolving landscape of society, the economy, and national security—driven by IT and AI—necessitates a transformation in how Polri carries out its duties. The discussion highlights the urgency of improving human resources, adapting to cybercrime threats, and implementing digital transformation for public services and precision law enforcement. It also emphasizes the need for responsive legal regulations, especially as current frameworks like the ITE Law do not yet fully address AI-related issues. Using an empirical legal approach, this paper analyzes the obstacles and strategic solutions necessary for Polri to remain relevant and professional in ensuring domestic security in the digital age. The conclusion stresses the importance of innovation, integrity, and cross-sector collaboration in enabling Polri to navigate complex future threats while upholding democratic and humanistic values.*

Keywords: Police 4.0, Artificial Intelligence, Cybercrime, Law Enforcement, Digital Transformation

1. Introduction

In the current modern era, the advancement of information and communication technology (ICT) has positively impacted global economic growth, influencing productivity, competition, and public engagement. However, increased online connectivity among governments, businesses, and the public has heightened challenges related to cybersecurity threats. The International Organization for Standardization (ISO) defines cybersecurity as the preservation of the confidentiality, integrity, and availability of information in cyberspace.¹ In this era, society is expected to overcome social challenges by leveraging technological innovations across various sectors, including education, urban planning, transportation, healthcare, and even security and intelligence.²

The rapid development of technology will drive the Fourth Industrial Revolution (4.0) in the coming decades. Klaus Schwab's book, *The Fourth Industrial Revolution*, explains this revolution, what it offers, its impact, and how we can harness it. The development of the Industry 4.0 revolution undoubtedly impacts various aspects of life, industries, human resources, organizations, crime, and so forth.³ Whether acknowledge or not, Industry 4.0 will reshaping the human experience across all domains. Automation technology, mobile computing, and artificial intelligence are no longer futuristic concepts but have become reality.⁴

The Industry 4.0 era marks the beginning of a paradigm shift in human civilization, where technological capabilities are rapidly advancing. These technological advancements affect all aspects of human life, from social, economic, political, health, to education.

Law Number 2 of 2002 concerning the Indonesian National Police (Polri) strengthens the existence and role of Polri in maintaining and ensuring domestic security using a civilian police approach. In an effort to reinforce Polri's duties as a law enforcement institution, Law No. 2 of 2002 grants broader authority and clarifies Polri's responsibilities, which include maintaining public security and order, enforcing laws, and providing protection, guidance, and services to the community. Law No. 2 of 2002 serves as the legal basis for Polri to carry out its duties as a law enforcement institution and protector of society.

Polri is tasked with organizing domestic security; thus, it is required to be able to observe, anticipate, and adapt to the developments of the Industry 4.0 technological revolution, such as Information Technology and Artificial Intelligence (AI). As emerging technology, the utilization of AI requires governance to be done safely and productively. This is because technological developments often lead to volatility, uncertainty, complexity, and ambiguity. These conditions pose challenges for Polri in carrying out its duties and authorities, including maintaining and ensuring domestic security.

¹ Muhammad Arbani, "Tantangan Dan Realisasi Intelijen Dan Keamanan Nasional Pada Era 5," *Advances in Social Humanities Research* Vol 2 No. 2 (February 2024): 216.

² *Ibid.*

³ Kompas Klasika, "Review Buku The Fourth Industrial Revolution: Optimis Menyambut Revolusi Industri 4.0," accessed via

<https://klasika.kompas.id/baca/review-buku-the-fourth-industrial-revolution/>.

⁴ Eko Indra Heri, "Tantangan Pengembangan SDM Polri di Era Revolusi Industri 4.0," *Jurnal Ilmu Kepolisian* Volume 13 Nomor 2 (August 2019): 91.

The increasing widespread use of Artificial Intelligence (AI) technology not only brings innovation but also raises serious security concerns. Threats to AI systems from cyberattacks and manipulation can result in detrimental impacts and require serious legal attention.⁵ The rapid growth of Artificial Intelligence (AI) Technology necessitates smart regulations to protect public interests while facilitating technological development.⁶

The rapid advancements in IT and AI pose a challenge for Polri to adapt and keep pace with these developments. New technologies like AI offer previously unimaginable potential for malicious state and non-state actors. This transformation also results in a significant increase in the quantity of digital information, thus posing challenges in effectively sorting data.

The development of IT and AI has significantly altered the national and global security landscape in recent years. It is in these circumstances that Polri plays a crucial and strategic role in maintaining public security in the era of IT and AI technological advancements.

From the description above, it is evident that Polri's challenges in the Industry 4.0 era include, among others: the utilization of new technology, increasing human resource competence, and adaptation to changes in public behavior. Of course, these challenges are not easy for Polri to face and handle. The main issue to be discussed in this paper is to reveal and discuss the future challenges for Polri concerning the development of IT and artificial intelligence.

2. Problem Statement and Aim

How do the future challenges for the Indonesian National Police (Polri) relate to the development of IT and Artificial Intelligence (AI)? And what steps need to be taken by Polri to address these challenges? This study aims to identify and discuss the future challenges for the Indonesian National Police (Polri) regarding the development of IT and Artificial Intelligence (AI), and the necessary steps to address these challenges.

3. Literature Review

The term Industrial Revolution 4.0 was first introduced by Klaus Schwab (2016), an economist, in his book titled *The Fourth Industrial Revolution*. In this book, Schwab's ideas regarding the Industry 4.0 revolution are presented as having transformed human life, mindset, and work methods, with technological influence being highly dominant.

Industry 4.0 was conceived as a response to global trends and challenges related to industrial production needs, competitive

pressures, product complexity and variety, and increasing speed and flexibility.

Klaus Schwab's *The Fourth Industrial Revolution* outlines the potential offered by Industry 4.0. Klaus believes that new ways of utilizing technology will bring positive impacts for human well-being. Innovations in biology, for instance, could provide solutions to previously intractable medical problems. On the other hand, Klaus also highlights the challenges that will be faced. Besides concerns about job displacement, there are also worries related to human relationships becoming increasingly dependent on technology. Symptoms of this are already visible. A 2010 study conducted by the University of Michigan noted that 40 percent of students experienced a decline in their social and empathetic abilities. Nevertheless, Klaus also presents various reasons for optimism in facing the Fourth Industrial Revolution.⁷

The Industrial Revolution 4.0 is more than just the utilization of interconnected smart systems and machines. Its scope is much broader, encompassing the fusion of technological advancements with the physical, digital, and biological domains, making this industrial revolution truly different from previous ones. We will witness breakthroughs in various fields, from gene sequencing to nanotechnology, and from 3D printing to biotechnology.

Artificial intelligence is the application of one of the fields of machine or computer science that studies how to create and perform tasks that are the same as or even better than those performed by humans. Studying how to make computers do things as humans do is a distinct field of artificial intelligence study. Furthermore, artificial intelligence involves applications and instructions related to programming computers to do things that humans consider intelligent. Expert systems, computer programs that can mimic the logic and knowledge of experts to solve specific problems, are examples. More specifically, Artificial Intelligence (AI) refers to knowledge that uses the development of machine intelligence in performing tasks and functions for humans based on human-like behavior.⁸

According to Gash and Hobbs in their book *Policing 4.0: Deciding the Future of Policing in the UK*, as quoted by Eko Indra Heri, there are six new realities that police must face in the Industry 4.0 era:⁹

- a) **Serving the fully digital world:** Every crime now has a digital footprint, meaning every police function must utilize digital technology, and data is one of the most important and strategic assets in policing.
- b) **Security by the private sector and civil society:** Private investment in crime prevention and investigation exceeds public investment made by the state; in fact, the ability of the private sector to combat crime often surpasses police

⁵ Eka N.A.M. Sihombing et al., "Implementasi Penggunaan Kecerdasan Buatan Dalam Pembentukan Peraturan Daerah (The Implementation Of Artificial Intelligence Usage In Local Legislation Forming)," *Jurnal Ilmiah Kebijakan Hukum* Vol. 14 No. 3 (November 2020): 425.

⁶ Mudha'i Yunus et al., "Tantangan Hukum dalam Pengembangan Teknologi Kecerdasan Buatan (AI)," *Jurnal Renvoi : Jurnal Hukum dan Syariah* Vol 1 No. 2 (January 2024): 84.

⁷ Kompas Klasika, *Op.Cit.*

⁸ Apriliana Lase et al., "Perspektif Sosiologi Terhadap Penggunaan Artificial Intelligence Dalam Pembelajaran Di Perguruan Tinggi," *Jurnal Ilmu Sosial dan Ilmu Politik Malikussaleh (JSPM)* Volume 6 Nomor 1 (2025): 66.

⁹ Eko Indra Heri, *Op.Cit.*, pp. 92-93.

services. Community empowerment in crime prevention is a method that needs to be enhanced by the police.

- c) **Responding faster to changes in every aspect of life:** Rapid development of innovation and social connectivity creates new crimes and new policing methods.
- d) **Utilizing cyber-physical systems:** With the exponential growth of "internet of things" devices, the boundaries between the physical and virtual worlds can blur.
- e) **Using an unknown amount of information and knowledge** about what can succeed in reducing crime and managing police services. Digitalization, data analysis, and continuous research are so important that they require decentralized decision-making and knowledge management.
- f) **Implementing maximum transparency:** Increasing the presence of public and police surveillance means that we must assume all police actions in public, private, and virtual arenas can be immediately reviewed. However, in policing, technology can help maintain the necessary confidentiality as a form of advanced technology required for assessment.

4. Research Methodology

This research employs an empirical legal approach, which is a type of research that examines and analyzes the functioning of law in society.¹⁰ According to Soerjono Soekanto and Sri Mamudji, empirical legal research involves field research where one observes and examines what happens in the field, specifically the application of regulations in practice within society.¹¹ This research focuses on the observation and analysis of legal practices within a social environment. It investigates how legal rules are applied in society, rather than solely focusing on written legal theory. The empirical legal approach seeks to understand law not only from a theoretical perspective but also from its application in the real lives of people, using appropriate research methods to observe and analyze these legal phenomena.

5. Results and Discussion

Human civilization will continuously experience dynamism in line with the development of science. Driven by technology, the pace of civilization is moving towards an extreme form. Ignoring new technology-based forms is akin to isolating oneself and stepping out of the hustle and bustle of the new order. Old approaches, as products of an era that was still largely manual, will become irrelevant for use in the current era. All human activities are increasingly made easier by the presence of various applications, offering conveniences in fulfilling human needs, a phenomenon unimaginable in previous eras. Human-to-human interaction has been replaced by the development of artificial intelligence (AI); work functions previously performed by professionals in all aspects will be replaced by the role of machines, which are assumed to have greater accuracy and speed than human work.¹²

As stated previously, the main issue discussed in this paper concerns the future challenges for the Indonesian National Police (Polri) in relation to the development of IT and Artificial Intelligence (AI). The policing challenges articulated by Gash and Hobbs certainly differ from those experienced by Polri, given the unique characteristics of Indonesia's national situation and conditions, leading to a different approach in responding to the Industry 4.0 revolution.

Polri's challenges in the era of Industry 4.0 development, such as IT and AI, include the rise of cybercrime and transnational crime, which necessitate strategic adjustments and enhanced capabilities. Furthermore, Polri faces challenges in maintaining security and order amidst increasingly complex social and political dynamics, and in ensuring excellent public service in the digital era. In other words, the challenges faced by Polri in the Industry 4.0 era involve an increasing incidence of cybercrime, digital fraud, and the spread of misinformation, thereby requiring greater attention to the protection of personal data and privacy.

Referring to Eko Indra Heri's article, "Challenges in Developing Polri's Human Resources in the Industry 4.0 Era," the core challenges for Polri include:¹³

- a) **The need for Polri personnel:** Human resources are the most crucial organizational asset because the main tasks of the organization are still carried out and operated by human labor, even though in the Industry 4.0 era, their dominance is reduced with the emergence of numerous applications and robotic systems. Under these conditions, Polri must be responsive by preparing personnel requirement plans, especially targeting those with qualities such as **information technology competence** and other specialized competencies, which are primary targets in Polri's recruitment.
- b) **The emergence of new crimes:** The phrase "crime is the shadow of civilization" holds true. This applies with the advent of the Industry 4.0 revolution, which has led to the emergence of new types of crimes, such as **cybercrime**, including online fraud, carding (credit card fraud), hoaxes, online prostitution, pornography, identity theft, and other offenses. These crimes pose a challenge for Polri to continuously revise its strategies by enhancing the capabilities of its personnel.
- c) **Modernization of public services:** Public demand for fast, easy, and affordable public services has become paramount, as the public's high level of activity and mobility means that public services can no longer be "complicated." Thus, the modernization of public services needs to be massively implemented across all institutions and ministries, including Polri, with the aim of boosting productivity and efficiency and fostering institutional accountability. Public services provided by Polri include police reports, case investigations, driver's licenses (SIM) and vehicle registration (STNK) services, and police clearance certificates (SKCK).

¹⁰ Ishaq, *Metode Penelitian Hukum Dan Penulisan Skripsi, Tesis, Serta Disertasi* (Bandung: Alfabeta, 2017), 70.

¹¹ Soerjono Soekanto and Sri Mamudji, *Penelitian Hukum Normatif : Suatu Tinjauan Singkat* (Jakarta: Raja Grafindo Persada, 1989), 12.

¹² Anshori, "Gagasan Artificial Intelligence Dalam Penerapan Hukum Di Era 4.0 Perspektif Penyelesaian Perkara Model Restorasi Justice Dan Hukum Progresif," *Legal Studies Jurnal* Vol. 2, No. 2 (2022): 2.

¹³ *Ibid.*, pp. 93-94.

In addressing the challenges mentioned above, Polri has the responsibility to ensure that its duties and authorities are carried out correctly and professionally while leveraging technological developments for the execution of its tasks. The willingness to change and innovate will undoubtedly facilitate Polri's adaptation to environmental changes and new threats resulting from the development of IT and AI.

The development of Artificial Intelligence (AI) technology has become a milestone in technological evolution, presenting new opportunities and fundamental changes in how we interact with the digital world.¹⁴ Furthermore, AI development has brought about profound transformations across various sectors of human life. However, this rapid development is not without legal challenges that necessitate the adjustment of existing regulatory frameworks.

Article 1, paragraph 8 of Law No. 19 of 2016 concerning Amendments to Law No. 11 of 2008 concerning Information and Electronic Transactions (ITE Law) states that an Electronic Agent is a device of an electronic system created to perform an action on specific electronic information automatically, operated by a person. Based on this definition, it can be said that AI currently holds the position of an electronic agent, as AI is still operated by a person who desires a certain action using AI. If there is a development of AI that surpasses human action, then the definition in Article 1, paragraph 8 of the ITE Law can no longer be used as the basis for AI regulation in Indonesia.¹⁵

The increasingly rapid development of AI technology, which no longer fits within the scope of existing regulations in the ITE Law, is one of the problems occurring in Indonesia. For instance, the ITE Law does not yet regulate actions that AI can perform without human command. Regulations must be prepared to anticipate such matters to protect public interest. This aligns with what Satjipto Rahardjo stated regarding progressive law, which posits that law does not exist for its own sake, as conceived by positive legal science, but for humanity in order to achieve human welfare and happiness.¹⁶ Therefore, law is always in a state of "law in the making" (law that is always in the process of becoming).¹⁷ Thus, it becomes crucial for policymakers to promptly anticipate the existence of AI with regulations capable of encompassing all actions performed using AI.¹⁸

The Artificial Intelligence (AI) technology revolution has transformed how we interact with the world around us. From virtual assistants to autonomous vehicles, AI has brought numerous remarkable innovations and advancements. However, the presence of AI also presents various impacts and challenges across different aspects of life.¹⁹

1) Positive Impacts of AI on Society

- a) **Technological Advancement:** AI has driven significant technological advancements in various sectors, including healthcare, transportation, and finance. This enables transformative changes in our daily lives.
- b) **Efficiency and Productivity:** The application of AI in business and industrial processes can enhance efficiency and productivity, reduce costs, and accelerate innovation.
- c) **Improved Quality of Life:** AI has led to improvements in the quality of human life through better healthcare services, more personalized education, and the ability to address social and environmental problems.

2) Negative Impacts of AI on Society

- a) **Job Displacement:** AI and automation can displace human jobs in some industries, raising concerns about technological unemployment.
- b) **Technological Inequality:** Access to AI technology is not evenly distributed globally, which can exacerbate the digital divide and socio-economic disparities.
- c) **Privacy and Ethical Issues:** The uncontrolled use of AI can threaten individual data privacy, and ethical issues arise in the use of AI for critical decision-making.

3) Challenges for Sustainable AI Development

- a) **Regulation and Law:** The presence of AI necessitates an appropriate regulatory and legal framework to address ethical, privacy, and data security concerns.
- b) **Training and Expertise:** Efforts are needed to develop skills and provide training for the public to keep pace with AI technology developments.
- c) **Research and Innovation:** Support for AI research and innovation is crucial to continuously develop technology that is beneficial and safe for society.²⁰

The AI technology revolution has brought many benefits and innovations to modern society. However, we must also confront various challenges, including the social, economic, and ethical implications of this technology. To maximize AI's benefits and mitigate its negative impacts, collaboration among the government, private sector, and civil society is essential. By addressing these challenges and supporting sustainable AI development, we can face the future with intelligent and responsible technology.²¹

According to St. Laksanto Utomo, in his presentation titled "Polri 4.0: Future Challenges for Polri Regarding IT & Artificial Intelligence," the impacts of IT and AI development on society are:²²

¹⁴ Qur'ani Dewi Kusumawardani, "Hukum Progresif Dan Perkembangan Teknologi Kecerdasan Buatan," *Jurnal Vej* Vol. 5 No. 1 (May 2019): 169.

¹⁵ Denico Doly, "Pemanfaatan Artificial Intelligence Dalam Penegakan Hukum Di Indonesia," *Kajian Singkat Terhadap Isu Aktual Dan Strategis* Vol. XV, No. 19/I/Pusaka/Oktobre/2023, Pusat Analisis Keparlemenan Badan Keahlian DPR RI: 2.

¹⁶ *Ibid.*, p. 3.

¹⁷ Satjipto Rahardjo, *Penegakan Hukum Progresif* (Jakarta: Kompas, 2010), 3-5.

¹⁸ Denico Doly, *Op.Cit.*, p. 3.

¹⁹ Roy Dwi Oktaviandi, "Revolusi Teknologi AI: Dampak dan Tantangan dalam Masyarakat Modern," *Opini* in <https://pid.kepri.polri.go.id/revolusi-teknologi-ai-dampak-dan-tantangan-dalam-masyarakat-modern/> (accessed June 14, 2025).

²⁰ *Ibid.*

²¹ *Ibid.*

²² St. Laksanto Utomo, "Polri 4.0: Tantangan Polri Masa Depan Terhadap Perkembangan IT & Artificial Intelligence," Presentation Material, Universitas Bhayangkara Jakarta Raya, 2025, p. 7.

- a) **Privacy and Security:** Protecting sensitive data is a primary concern in technology implementation.
- b) **Service Improvement:** IT and AI technology can enhance the quality of public services and community safety.
- c) **Business Transformation:** Businesses must adapt to digital transformation to remain competitive and relevant.

From a sociological perspective, the changes and developments in technology, especially AI, have had a significant impact on human life. The use of AI technology has given rise to various issues such as privacy, transparency, regulation, and social control. AI technology is beginning to change how we perceive social norms and values.

Decisions made by AI can reflect or reinforce existing cultural biases. AI enables the creation of new cultural content, such as machine-generated music, art, and literature. This challenges traditional concepts of creativity and originality in culture, as well as changing how we consume and appreciate artworks. AI technology can influence individual and community identity, both through algorithms that direct the content we consume, and through technology that helps shape how we express ourselves online and offline. The use of AI has brought significant social change.²³ The use of application-based AI has transformed public service methods from manual/traditional to online. AI helps increase efficiency and accelerate public service processes, leading to significant social changes.

Social change due to the use of AI can refer to William F. Ogburn's theory of social change. According to William F. Ogburn, as quoted by Apriliana Lase et al.,²⁴ social change occurs due to an imbalance between material development (technology) and non-material development (culture, norms, and values). AI, as a rapidly developing technology, can affect social structures and interactions in society, both positively and negatively.

Considering the developments in IT and AI, which bring positive impacts to human life, especially in increasing efficiency and productivity across various fields. With its ability to process data quickly and accurately, AI technology has helped many organizations and individuals efficiently. However, the development of IT and AI can also have negative impacts, such as the increasing prevalence of cybercrime and the spread of misinformation.

In the context of cybersecurity, St. Laksanto Utomo highlights at least three aspects that need attention:²⁵

- a) **Data Protection:** Protecting sensitive data is a priority to prevent information leaks.
- b) **Cybercrime Threats:** Cybercrime threats are becoming more complex and require a proactive approach to prevention.
- c) **Early Detection:** Early detection of cyberattacks is key to mitigating their negative impacts.

Upon examination, current regulations in Indonesia do not yet fully support AI development. Many regulations are outdated and do not accommodate the latest technological advancements. Furthermore, the lack of a clear and coordinated legal framework also hinders innovation in the AI sector. The government needs to update existing regulations and develop a comprehensive legal framework to support AI development. This includes strengthening regulations on privacy and ethics, as well as providing incentives for companies and investors who invest in AI technology.

According to Soerjono Soekanto, law enforcement can be influenced by several factors: law, law enforcement officials, facilities, society, and culture.²⁶ The legal factor refers to the laws and regulations governing specific issues. In the context of information technology, the ITE Law (Law on Information and Electronic Transactions) is one legal product that regulates electronic transactions and matters related to the cyber world. The law enforcement official factor involves police, prosecutors, and judges who possess integrity and capability regarding legal actions, for instance, those related to the cyber world. The societal factor concerns the public's need for regulation and law enforcement regarding actions in the cyber realm. The cultural factor relates to societal culture in influencing a law.²⁷

The facilities and infrastructure factor pertains to the tools or devices used to support law enforcement. This factor becomes crucial in the implementation of law enforcement related to AI. AI is a tool or device that can assist law enforcement officials in carrying out their duties. A successful example of AI use in law enforcement is the implementation of **e-fines**, where e-fines help prevent other criminal acts, such as bribery of law enforcement officials. It's important to note that law enforcement carried out by a device or tool will be treated differently from law enforcement performed by a human.²⁸

In the context of law enforcement amid the development of IT and AI, St. Laksanto Utomo highlights several key areas of concern:²⁹

- a) **E-Commerce Crime:** E-commerce crime is on the rise and demands effective law enforcement.
- b) **Legality of Online Transactions:** Ensuring the legality of online transactions to prevent their misuse for illegal activities.
- c) **Digital Forensics:** Digital forensics is necessary to investigate digital crimes and collect electronic evidence.

Considering the discussion above on the impacts of IT and AI development on society, cybersecurity, and law enforcement, it's clear that the challenges facing the Indonesian National Police (Polri) in the future are substantial. The Industry 4.0 revolution and the advancements in IT and AI tend to trigger volatility, uncertainty, and ambiguity within society, which must be addressed swiftly and appropriately. Moving forward, Polri will not only deal with visible perpetrators but also with cybercriminals.

²³ Apriliana Lase et al., *Op.Cit.*, p. 72.

²⁴ *Ibid.*, p. 73.

²⁵ *Ibid.*, p. 8.

²⁶ Soerjono Soekanto, *Faktor-faktor yang Memengaruhi Penegakan Hukum* (Jakarta: Raja Grafindo Persada, 2004), 42.

²⁷ Denico Doly, *Op.Cit.*, p. 3.

²⁸ *Ibid.*

²⁹ St. Laksanto Utomo, *Op.Cit.*, p. 9.

Digital transformation is a process of change and improvement within organizations, businesses, and industries through the implementation and utilization of digital technology. It's used to enhance efficiency, effectiveness, and productivity, as well as to improve interaction with the public and facilitate access to information and services. Digital transformation involves leveraging technologies such as data processing and analysis, mobile applications, the Internet of Things (IoT), cloud computing, and blockchain technology. The strengthening of Polri's role through digital transformation in the current digital era presents many new challenges for the world of security and policing.³⁰

Polri plays a vital role in maintaining domestic security and ensuring that domestic security maintenance (Kamdagri) duties and activities are carried out with precision and good effectiveness. Domestic security is a condition where the state and its society feel safe and protected from internal threats. This includes safeguarding against crime, criminal acts, terrorism, rebellion, and other threats that can endanger public safety and order. Domestic security encompasses various aspects, such as public safety, environmental security, and economic security. Polri is responsible for protecting society from various threats and crimes, including conventional and digital crimes.³¹

Digital transformation can help the Polri organization enhance the roles and responsibilities of its members more effectively and efficiently. The use of Information and Communication Technology (ICT) can assist the police in better collecting, analyzing, and utilizing data. This will enable the police to handle crimes more quickly and precisely. Digital technology facilitates faster information exchange and easier communication between individuals or groups with different roles. This can create opportunities for innovation, cross-functional teamwork, and increased efficiency. Digital transformation helps Polri improve transparency and accountability. With integrated information systems, data and information can be accessed by all Polri members easily and quickly. This will enable Polri to measure the performance and effectiveness of each member and work unit, allowing for necessary corrective actions. However, digital transformation also requires the appropriate role from Polri members. In this regard, role theory can help police organizations understand the roles and responsibilities that each member must undertake in utilizing digital technology properly and effectively. Therefore, Polri must ensure that its members understand and can effectively integrate digital technology into Polri's work routines.³²

To respond to the developments in IT and AI, Polri needs to enhance its analytical capabilities and machine learning to efficiently process extensive information and analyze actionable data. This means Polri's willingness and ability to adapt and innovate using IT and AI in carrying out its duties will be crucial in achieving efficiency, effectiveness, and professionalism. Polri is required to be able to face and resolve the complexity of problems and challenges resulting

from the use of IT and AI, such as the increase in cybercrime and technological disruption. The negative impacts of technological advancements like IT and AI are serious challenges for Polri.

Of course, in facing these challenges, the implementation of IT and AI by Polri in the 4.0 era requires the development of state-of-the-art information systems, the establishment of a collaborative security ecosystem, and public-private partnerships to enhance resilience against cyberattacks. Polri's success in harnessing the positive potential of 4.0 for community security and order, including national security, heavily depends on commitment, resources, and strong cross-sector cooperation in addressing current and future challenges.

From media reports, it's evident that Polri's services have developed quite rapidly. This includes the use of ETLE (Electronic Traffic Law Enforcement), digital forensic audits, cyber police, cyber patrols, and online community services. Additionally, Polri has adopted the Scientific Crime Investigation (CSI) method in handling criminal cases.

This program for developing technology-based Polri services represents the Police 4.0 perspective, a priority initiative aimed at fostering excellent and adaptable Polri human resources in the midst of the Industry 4.0 Revolution. Police 4.0 emphasizes continuous growth in serving the public. Polri consistently develops online community services through its "SuperApps Presisi," an application integrating various services such as e-fines, online SKCK (Police Clearance Certificates), online STNK (Vehicle Registration), online SIM (Driver's Licenses), and emergency call features. Polri has also launched the 110 emergency service number.

In the context of law enforcement, Polri has developed online SP2HP (Investigation Progress Notification Letters). Dumas Presisi is an application launched by Polri as a public complaint platform regarding the performance and conduct of police officers.

The latest challenge for Polri is the emergence of Society 5.0, a concept of collaboration between humans and machines to improve quality of life, solve problems, and create a better environment. This represents a technological and societal leap from Industry 4.0. Naturally, this demands more skilled Polri human resources in management, planning, programming, cybersecurity expertise, IT expertise, and robotics.

The various breakthroughs made by Polri, as described, are merely initial steps and must be continued sustainably. It's a professional obligation for Polri in this Industry 4.0 era to be adaptive and innovative.

From the above explanation, it can be concluded that the Industrial Revolution 4.0, encompassing both IT and AI, has triggered social changes in society, affecting social structures and interactions both positively and negatively. This situation

³⁰ M. Abrar Tuntalanai, "Penguatan Peran Polri Di Era Transformasi Digital Guna Mendukung Kamdagri Dalam Rangka Ketahanan Nasional," Kertas Karya Ilmiah Perseorangan (Taskap) Program

Pendidikan Reguler Angkatan (PPRA) LXV Lemhannas RI Tahun 2023, p. 1.

³¹ *Ibid.*, p. 2.

³² *Ibid.*, p. 45.

presents a significant challenge for future Polri, requiring them to adapt to IT and AI developments while simultaneously leveraging these technologies to support Polri's duties.

Polri's ability to adapt to IT and AI developments is crucial and strategic, not only in carrying out its duties but also in its efforts to maintain and ensure domestic security. Moreover, the evolution of IT and AI technology has significantly altered the national and global security landscape in recent years. Therefore, Polri needs to continuously enhance its commitment and innovate to adapt to the Industrial Revolution 4.0, namely IT and AI. Polri's adaptive capacity to the Industry 4.0 revolution is the main key to increasing efficiency, effectiveness, and professionalism in performing duties, as well as maintaining and ensuring domestic security. The future challenges for Polri are becoming more complex and sophisticated with the emergence of cybercrime and similar threats. Thus, the effort to transform Polri into a law enforcement institution that is not only firm but also possesses human resources who are integrated, solid, professional, and capable in the Police 4.0 era is a demand that needs to be realized. This aligns with the "Presisi" (Predictive, Responsibility, Transparent, Fair) concept initiated by the Chief of Police, which emphasizes that improvements should not only focus on Polri's performance but also on internal institutional reform. Various programs are being prepared to transform Polri into a "Presisi" institution in the modern era.

To face the challenges of the Industry 4.0 Revolution, such as the development of IT and AI, Polri needs to undertake the following strategic and continuous steps:

- a) **Enhancing the quality of human resources (HR)** through competency-based education and training relevant to the digital era, selective recruitment (recruiting personnel with understanding and abilities suited to the demands of the 4.0 era), and developing critical thinking and innovative capabilities.
- b) **Utilizing information technology.** In using IT, Polri needs to develop systems and applications that support the execution of duties, such as public services, law enforcement, and internal management. It also means leveraging the potential of big data and analytics to identify potential crimes, improve law enforcement effectiveness, predict crime trends, and ensure data and information security.
- c) **Improving public services.** Polri needs to provide fast, easily accessible, and transparent public services, such as online SIM, online SKCK, and online SP2HP. It also involves prioritizing a humane, approachable, and responsive approach and minimizing bureaucracy in public services according to community needs.
- d) **Strengthening law enforcement.** Polri needs to enforce laws justly and transparently, without discrimination, and protect public rights by implementing an e-investigation system to increase efficiency and transparency in criminal investigation processes and enhance investigators' capacity to handle cybercrime.
- e) **Increasing transparency and accountability.** Enhancing public information disclosure related to Polri's performance and various operational activities, strengthening internal oversight systems, and conducting

performance evaluations to ensure accountability in duty execution.

- f) **Boosting collaboration and synergy with other institutions.** Polri needs to build close collaboration and synergy with other institutions, both government and private, to increase the effectiveness of handling various issues, as well as cooperating with the community in efforts to maintain public safety and order.

By implementing these steps, Polri is expected to become an increasingly adaptive, professional organization capable of providing the best services to the community in the Industry 4.0 era. This aspiration aligns with the characteristics of the new Polri in the Police 4.0 era, which is strategically oriented, emphasizing responsiveness, innovation, and public trust. Polri must be able to adapt to technological and informational advancements and integrate technology into its operations. Furthermore, Polri needs to uphold the principles of democracy, professionalism, and humanism in serving the public.

The key is that Polri needs a strong will to undergo change and innovate, as social changes driven by the Industrial Revolution 4.0 increasingly impact Polri in carrying out its duties and authorities as a law enforcement institution in its efforts to maintain and ensure domestic security. The Industry 4.0 era, full of change, demands that Polri continuously reform and innovate to provide the best service to the public.

The reality of the Industrial Revolution 4.0, which has permeated all aspects of life such as political, legal, economic, national, and international, including society and individuals, has also created a complexity of social and legal problems. The current lack of specific AI regulation in the ITE Law needs to be a point of attention for all stakeholders. The increasing prevalence of cybercrime and other technology-based criminal forms demands Polri's willingness to change and innovate so that Polri, as a law enforcement institution, can adapt to IT and AI developments. This is important because future law enforcement will undoubtedly be influenced by technological factors, and thus technology-based facilities and infrastructure are critically needed by Polri in carrying out its duties to maintain and ensure domestic security, and these must be provided by the state.

6. Conclusion

The Industry 4.0 revolution, encompassing both Information Technology (IT) and Artificial Intelligence (AI), has triggered significant social changes within society, impacting social structures and interactions both positively and negatively. This presents a formidable challenge for the Indonesian National Police (Polri) in the future, requiring them to adapt to the developments in IT and AI, while simultaneously leveraging these technologies to support their operational duties. The key lies in Polri's strong willingness to embrace change and innovation, as the social transformations driven by the Industry 4.0 revolution increasingly influence Polri in fulfilling its roles and responsibilities as a law enforcement institution dedicated to maintaining and ensuring domestic security.

The reality of the Industry 4.0 revolution, which has permeated all aspects of life such as political, legal, economic, national, and international, including impacts on society and individuals, has also created complex social and legal challenges. The current lack of specific AI regulation in the ITE Law (Law on Information and Electronic Transactions) needs to be addressed by all stakeholders. The rise of cybercrime and other technology-based offenses demands Polri's commitment to change and innovation, enabling it, as a law enforcement institution, to adapt to the advancements in IT and AI. This is crucial because future law enforcement will undoubtedly be influenced by technological factors. Therefore, the state must fulfill Polri's critical need for technology-based facilities and infrastructure to carry out its duties in safeguarding and ensuring domestic security. To address the challenges posed by the Industry 4.0 Revolution, particularly the advancements in IT and AI, Polri needs to undertake strategic and continuous measures. These include: (1) enhancing human resource quality, (2) optimizing information technology utilization, (3) improving public services, (4) strengthening law enforcement, (5) increasing transparency and accountability, and (6) fostering collaboration and synergy with other institutions. These steps align with efforts to shape the characteristics of the "new Polri" in the Police 4.0 era, emphasizing responsiveness, innovation, and public trust through a strategic vision. Polri must be capable of adapting to technological and informational progress and integrating technology into its operations. Furthermore, Polri needs to prioritize the principles of democracy, professionalism, and humanism in providing services to the community.

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